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Improving Large Sales Opportunity Identification Process

Proposal for Developing Demand Plan Accuracy

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This has been quite a journey with all the ups and downs, so I am more than happy to finally see the study coming to an end. I've learned a lot about academic work, research and process improvement during this process. I've also learned that situations at work or in personal life can change and you might have to re-schedule your well thought plans. Finishing this study has given me know-how and motivation to use academic research as one tool in finding ideas to business and personal dilemmas also in the future.

I am sincerely grateful for my instructors from Metropolia UAS, Dr. Thomas Rohweder, Zinaida Grabovskaia and Sonja Holappa for giving me continuous support and guidance during this long process. I want to thank my already former manager, Juhana Häkkänen, for patience and positive attitude in supporting my studies. Also, all my great co-workers who gave input during the process deserve a warm thank you.

Balancing work, school and personal life including two children has also been quite a challenging cycle of continuous prioritization with epic wins and miserable fails. I must give the biggest thanks of all to my beloved wife Maria for supporting and encouraging me in completing my studies. I would not have made it without you.

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<p>This thesis focuses on improving the identification process of large sales opportunities in a mid-sized Finnish technology company with a high mix-low volume business. Improving the ability to react on possible large sales opportunities is interesting from supply chain perspective, especially when majority of company's manufacturing is executed in an Assemble-to-Order basis.</p> <p>In this study, qualitative and quantitative data collection methods were used, and the selected research method was action research. Current state analysis was conducted to build understanding and awareness of the process and its challenges. The main data sources were questionnaires, key stakeholder interviews, workshops and the case company's internal material. Based on the collected data, strengths and weaknesses of the current process were identified. Relevant literature was researched in order to find the best practices to improve the process and a conceptual framework was created based of these findings. The conceptual framework was then used in building a draft of an improved process.</p> <p>As a result, a proposal for an improved large sales opportunity identification process was created with specific improvement actions together with some ideas for further development. Implementing these actions, would help the case company to improve the efficiency of large sales opportunities identification process.</p>	
Keywords	Process Standardization, Demand Planning, Sales Forecast, Sales Opportunity

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1 Introduction

Large sales opportunities, which might be further converted into actual sales orders lay an important role in every manufacturing company's operations. These opportunities are interesting from the financial perspective, but they can create challenges to the supply chain. When large sales opportunities start to materialize, they can affect heavily the supply chain and operations due to the large impact on material demand and resourcing.

Identifying these opportunities well before receiving the actual sales order, aligning the demand plan accordingly with good communication towards the key stakeholders, might be a crucial step in securing cost efficient and on time manufacturing. This is especially important in Assemble-to-Order (ATO) type of production due to a missing finished goods inventory. In the worst-case scenario, excluding the large sales opportunities in the company's demand plan might create a situation where customer demand cannot be fulfilled, and the sales opportunity will be lost completely.

1.1 Business Context

The case company of this Thesis is a Finnish technology company and a global leader in the environmental and industrial measurement business. The company's annual sales are roughly 400MEUR and the company has approximately 1800 employees of which about 1100 are located in Finland. Most of the environmental business customers are meteorological institutes, airports, roads and railroad, defense, and energy industry companies. The industrial customers operate in various industries such as life science, greenhouses, manufacturing and power industry. The customers use integrated systems or fixed and hand-held measurement instruments as well as calibration services for temperature, humidity, dewpoint, carbon dioxide, moisture in oil and pressure.

The company defines its business as *high mix-low volume* and most of its products are manufactured on an *Assemble-to-Order* basis. The products are highly configurable, and the product delivery times can be just one workday for small quantities. This creates a very demanding environment for successful and cost-efficient operations. The company's environmental business is not growing significantly due to limited markets and customers mainly from the public sector. The company's growth is sought mainly through mergers and acquisitions. The industrial measurement business has organic growth and the business continuously seeks new markets with new solutions resulting in an annual

growth of over 10%. The company is innovation oriented with over 10% of net sales annual investment to research and development.

1.2 Business Challenge, Objective and Outcome

The business challenge for the case the company is that fluctuating sales demand a large product portfolio and customized products is challenging to forecast. Since the case company's operating model is Assemble-to-Order, sudden large sales opportunities can create availability problems due to long component lead times, create extra costs in supply chain and operations or increase the risk of excess and obsolete stock.

The case company has a process in place for identifying large sales opportunities, but it leaves room for improvement. The current process is not effective enough and some large opportunities are constantly being missed.

Thus, the objective of this thesis is to *develop an improved large opportunities identification process*. Accordingly, the outcome of this thesis is an improved large opportunities identification process.

1.3 Structure of the Thesis

This Thesis is conducted by carrying out a current state analysis to identify the strengths and weaknesses of the current Large Sales Opportunity identification process. The data for the current state analysis is gathered by stakeholder interviews, historical order book analysis and case company internal documentation. Best practice of operative sales forecasting and execution is reviewed in the literature review.

2 Method and Material

This chapter introduces the Research Approach and Research Design of the Thesis. In addition, the data collection and analysis methods are introduced.

2.1 Research Approach

According to Saunders et al. (2009:141), important in selecting a research strategy is that the selected strategy helps to answer to research questions and fulfill the set targets.

Kananen (2013: 31-35) describes qualitative research methods as methods which are mostly used in cases where the phenomenon is not well known. It means that statistical methods cannot be easily applied to the research. Using quantitative methods usually requires that a theory or a model of a phenomenon already exists. He continues that qualitative research tries to present the phenomenon in words rather than in numbers as quantitative research would do. Also, according to Kananen (2013: 40), qualitative and quantitative research methods tend to make a statement of the current problem and the research usually does not go any further than that.

Action research is an approach that combines both, qualitative and quantitative research methods (Kananen 2013: 40) and is a better fit into this kind of research problem. As per Coughlan et al (2002: 222-228), the key in action research approach is to use scientific methods in finding a solution to social or organizational issues collectively with the actual stakeholders. Usually the action research approach is conducted by an outside facilitator, but also internal researchers can be used. This is common especially when managers are participating in an academic program. Saunders et al. (2009: 147) add, that action research differs from other research strategies with pure concentration on action and change inside an organization.

Some of the identified characteristics of an action research approach is that the researcher should actively participate in the action, execute the research in co-operation and contribute in solving the problem with a scientific approach (Coughlan 2002: 224)

As per Saunders et al. (2009:148), action research approach has four different stages, which are illustrated in Figure 1.

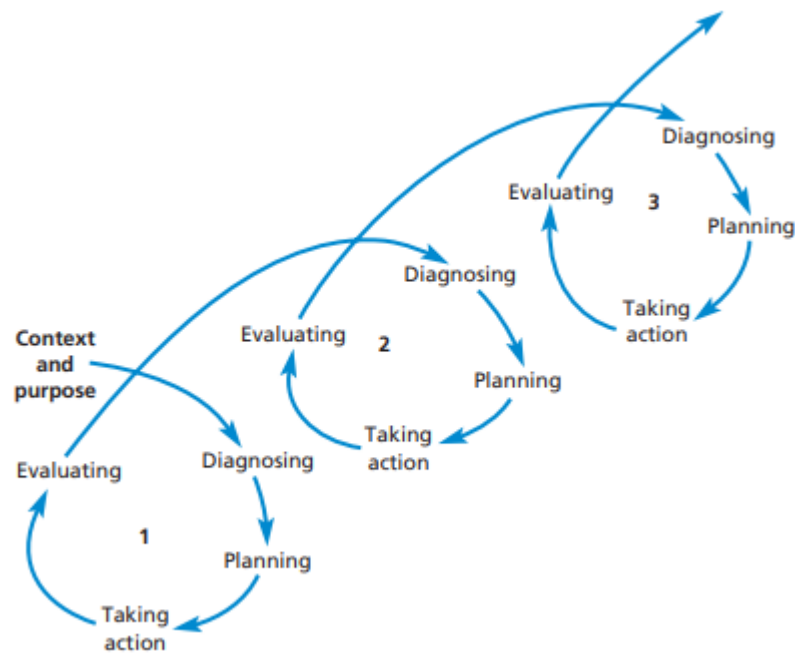


Figure 1. Stages of action research approach (Saunders et al. 2009: 148)

As seen in Figure 1, action research is a continuous cycle, which starts from diagnosing the current problem, planning a solution together with the organization, taking action rapidly and evaluating the results. After the evaluation with stakeholders, a new research cycle is started if needed. This reminds closely the continuous improvement tool, PDCA (Plan-Do-Check-Act), the aim of which is to improve process inside a company as presented by Singh et al. (2019: 12). The aim of the PDCA tool is to be continuous, steadily emerging and involving, similar to action research.

This thesis uses qualitative and numerical data. The research study concentrates on finding a solution for the identified and immediate problem, with the responsible manager as the author. This research aims to change the current process and the iterative development continues also after the research. Therefore, action research is chosen as the research approach.

2.2 Research Design

The research design of this Thesis is shown in Figure 2. It visualizes the four steps in the research, data inputs used and outcomes of each step.

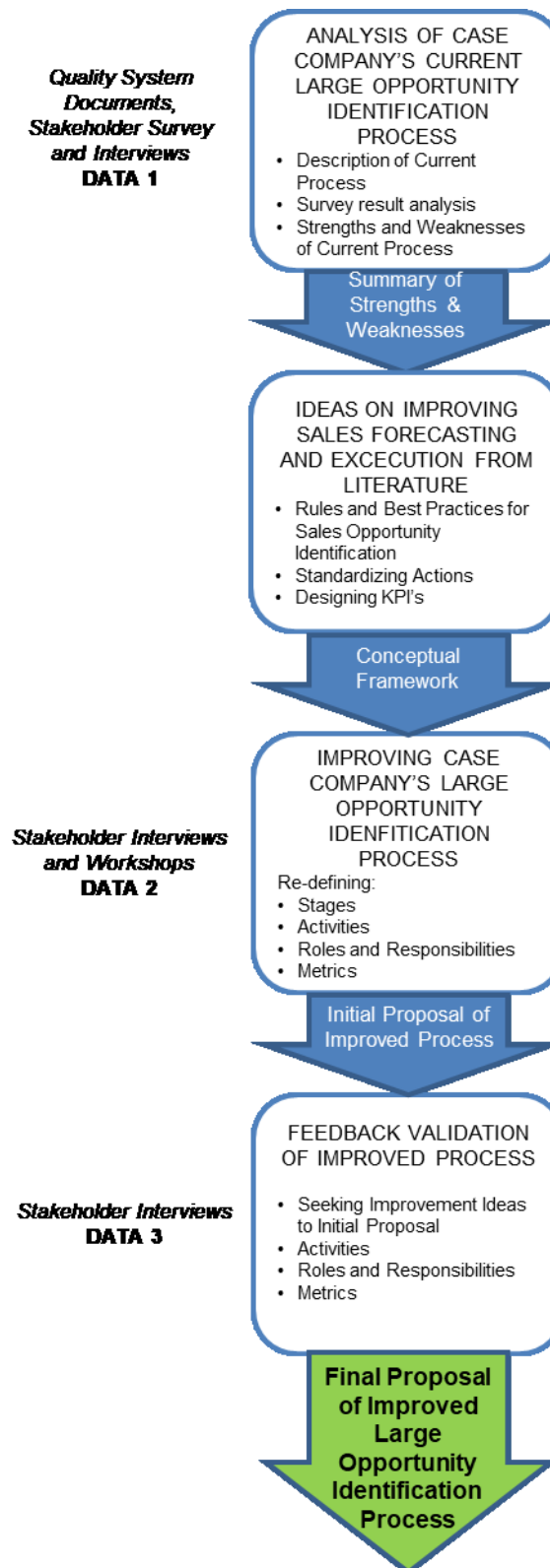


Figure 2. Research design of this study

As seen in Figure 2, the outcome of this Thesis is to create a validated final proposal of the Large Sales Opportunity identification process. The first step is to understand the current state of the process by performing a current state analysis. The aim of the current state analysis is to understand the current way of working and identify the strengths and weaknesses of the current process. The current state analysis is conducted by investigating quality system documents, interviewing stakeholders and conducting a survey. Solutions to identified strengths and weaknesses are researched from relevant literature.

Based on the solutions found to deal with the weaknesses identified, a proposal of improved process is created in the stakeholder interviews and workshops. The next step of the research is to validate the proposed framework together with key stakeholders and management, trying to identify any final improvement ideas to the process. The final step of the research is a proposal for the improved process.

2.3 Data Collection and Analysis

Data for this study is collected from several data sources and it is collected in three different rounds. Data 1, for the current state analysis, Data 2, for building a conceptual framework and Data 3, for validation and building the final, corrected proposal. The details of data collection are shown in Table 1.

Table 1. Details of data collection

	Participants / role	Data type	Topic, description	Date, length	Documented as
Data 1, for the Current State Analysis					
1	Respondent 1: Demand Planner	Face to face Interview	Experiences and feedback of Large Opportunities Identification process	9 th Jan 2019, 30 min	Field notes and recording
2	Respondent 2: Head of Demand and Supply Chain Management	Face to face Interview	Interview about building the process in 2015 and its current state	10 th Jan 2019, 45 min	Field notes and recording

3	Respondent 3: Sales Manager 1	E-mail question- naire	Questionnaire about the Operations performance in one actual Large Sales Opportunity case	14 th Jan 2019	E-mail
4	Respondent 4 Sales Manager 2	E-mail question- naire	Questionnaire about the Operations performance in one actual Large Sales Opportunity case	18 th Jan 2019	E-mail
5	Respondent group 1: Production Planners, 7 persons	On-line question- naire	Questionnaire about Large Opportunities Identification process and tools	18 th Jan 2019	Questionnaire data and summary
Data 2, for Building Conceptual Framework					
6	Respondent group 2: Demand Planner Production Planner 1 Production Planner 2	Discussion	Proposal building	11 th Nov 2019	Field notes
Data 3, from Validation					
7	Respondent 5: Head of Demand and Supply Chain Management	Discussion	Validation, evaluation of the proposal, collection of further improvement ideas	27 th Jan 2020	Field notes and recording

As seen in Table 1, data for this project was collected in three rounds. The first round, Data 1, was collected for the current state analysis through two stakeholder interviews, e-mail feedback and a survey. Interviews were conducted with Demand Planner and Head of DSCM and a questionnaire was sent to Production Planners in Finnish and the field notes and answers were later translated in English. E-mail questions sent to the Sales Managers were performed in English. The interviews were held on the company premises with questions created in advance.

Questions and survey format in questionnaire to Production Planners can be found in Appendix 2. Appendix 3 presents the field notes from Data 1 section interview 1 with Demand Planner. Appendix 4 shows the questionnaire and answers from Sales Manager 1 in Data 1 section. The field notes from validation in Data 3 section can be found in Appendix 5.

Table 2. Internal documents used in the current state analysis, Data 1

	Name of the document	Number of pages/other content	Description
A	Check Lead Time Process	1 diagram	Process diagram
B	Large Sales Opportunity Identification instructions	2 pages	Process instructions

As seen in Table 2, this research analyzed two internal documents. The documents were a process diagram of the current Check Lead Time Process and instructions for the Large Sales Opportunity Identification process.

The documents were analyzed to give input the current state analysis, Data collection 1, to achieve a better understanding of the current process status, its strengths and weaknesses. The data was analyzed using thematic analysis.

In this Thesis, understanding the current state was clearly the biggest part of data analysis. The current state analysis and its findings are discussed in section 3 below.

3 Current State Analysis

This section discusses the current process of identifying large sales opportunities in the case company. The section includes three sub-sections including an overview of the process, description of each process step and at the end, a summary of the identified strengths and weaknesses is presented.

3.1 Overview of the Current State Analysis Stage

The current state analysis was conducted in three different steps.

First, an overall understanding of the process was formulated by analyzing current process charts and descriptions. This created a basic knowledge of the process and communication between stakeholders, identifying large sales opportunities and responsibilities.

Second, the analysis focused on understanding the current way of working in each part of the process. This was done by conducting several interviews with the key stakeholders, one survey and four e-mail questionnaires. By doing this, a deeper insight of the current state in different process steps was gained.

Finally, a summary of key strengths and weaknesses was created based on the results of previous steps. The weaknesses found were mapped into the current process chart for better visualization.

3.2 Description of the Current of Large Sales Opportunities Identification Process

The findings are based on the case company's internal documentation listed in Table 2 earlier. Internal documentation used are Check Lead Time process chart and a process instruction for Large Sales Opportunity Identification.

3.2.1 Identifying Large Sales Opportunities in the Case Company

Currently, the case company's large sales opportunities identification is part of a process named Check Lead Time, which is shown in Figure 3.

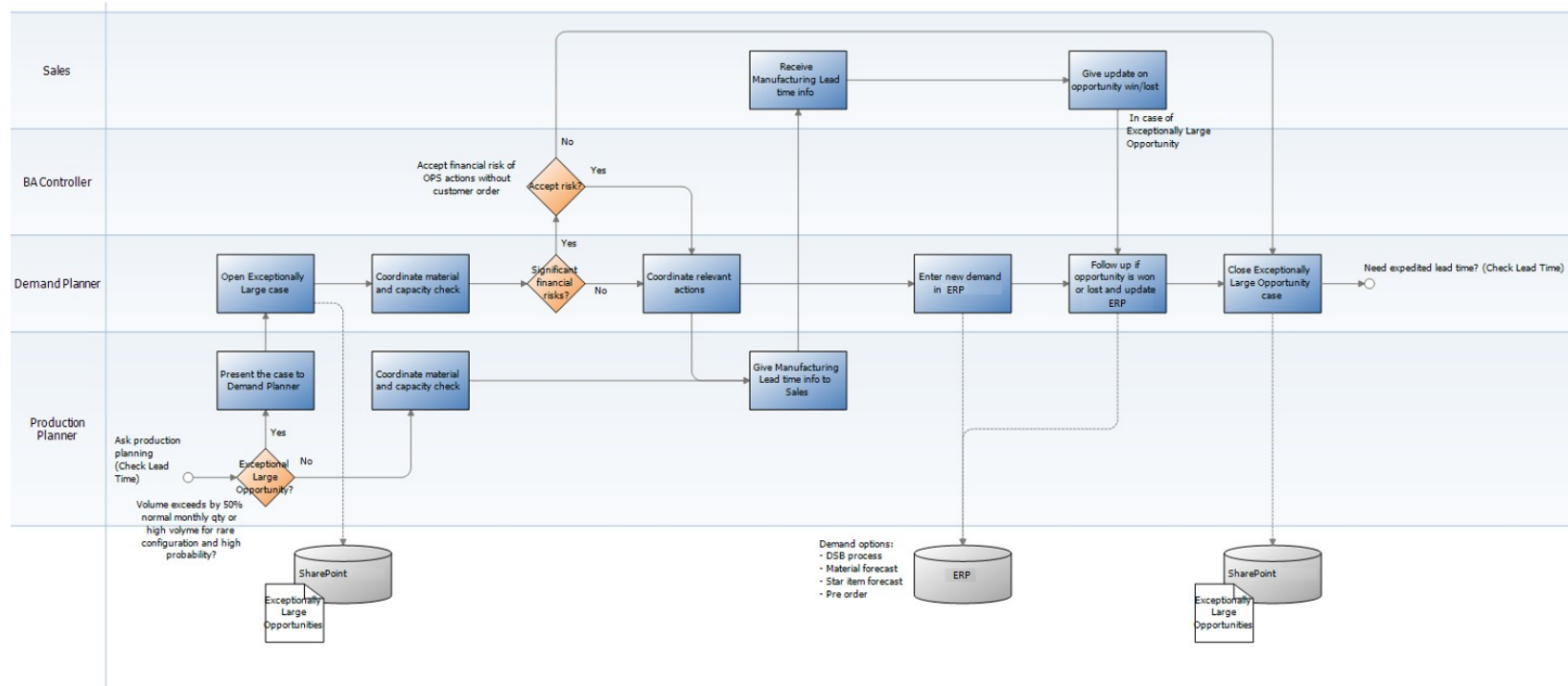


Figure 3. Current check lead time process

As shown in Figure 3, the process starts with a manufacturing lead time request by Sales to Production Planning. The production Planner makes the decision of presenting the opportunity to the Demand Planner as a Large Sales Opportunity or continuing a standard lead time request with material and capacity check.

The decision criteria for Large Sales Opportunity are the following:

- the probability for receiving the order is high (> 80%)

AND

- the requested volume for any single product in the potential order exceeds roughly 50% of its normal monthly total sales

OR

- or less if the desired product configuration is uncommon

OR

- the value of a single order line exceeds 100,000 EUR

When the Demand Planner gets a notification of a possible Large Sales Opportunity, the Planner first verifies that the Large Sales Opportunity criteria are fulfilled. If yes, then the Demand Planner opens a SharePoint ticket for a Large Sales Opportunity follow up and actions. If not, the Demand Planner returns the case back to the Production Planner for a routine manufacturing lead time request processing.

3.2.2 Coordination, Actions and Follow-up

After a Large Sales Opportunity case has been identified and opened at SharePoint, the responsible Demand Planner begins the materials and capacity check, as shown in figure 3. The material check is done at the Company's ERP system based on several data inputs such as current material inventory balance, firm sales orders, forecasted sales

orders and incoming purchase order schedules. The capacity check is done at the Company's manufacturing execution system (MES), which shows the daily and weekly capacity, open production orders and firm sales orders. If further discussion or more information is needed, the Demand Planner contacts the purchasing and manufacturing team leaders directly.

The Demand Planner's actions mainly focus on changing the current demand plan in the ERP system to reflect the specific material demand of the Large Sales Opportunity to purchasing and suppliers. Communication regarding large sales orders is organized via ERP system and in some cases manually, by e-mails and verbal communication.

If the demand planning actions create significant financial risks, an approval from the Business Controller is required.

When the Demand Planner has analyzed the situation and done the adjustments to the ERP system demand if needed, the Production Planner is informed so that he or she can quickly respond to the actual manufacturing lead time request to Sales. Demand Planner tasks continue with a regular follow up of the Large Sales Opportunity and adjusting the demand in the ERP system if needed.

Follow-up ends when the order is won, and customer delivery is made or when the sales opportunity is lost. SharePoint ticket is updated accordingly.

3.2.3 Roles and Responsibilities

Sales Managers and Sales Coordinators

The role of Sales Managers and Sales Coordinators is to request manufacturing lead times for large quotes and sales orders from production planning. The request is presented in a clear and simple format which includes at least the requested product, quantity and product configuration. Information about customer, desired lead time and the case probability are optional but very helpful for Production Planners.

Production Planners

Production Planners are responsible for the daily production scheduling and giving manufacturing lead times to Sales. If a large sales opportunity request is identified, the request is then forwarded to Demand Planners.

Demand Planners

The Demand Planner's main duty is to ensure the correct material demand visibility in the ERP system for the purchasers, suppliers and manufacturing. This includes involvement in the monthly Sales & Operations Planning process, follow up and actions related to identified large sales opportunities and quick fixes to the demand plan in the ERP system if needed.

3.3 Identified Strengths and Weaknesses

This section introduces the strengths and weaknesses identified in the current large opportunity identification process based on the interviews shown in Table 1 and the internal documents shown in Table 2. The questionnaire for the interviews included same questions for each participant, which can be found in Appendix 2.

Based on the interviews and a questionnaire, a total of four strengths and eight weaknesses were found in the current large opportunity identification process. The strengths are listed in Table 3.

Table 3. Strengths of the current large opportunity identification process based on interviews

Identified Strengths	
1.	Current tool is good as a notebook for follow up
2.	Tool and concept itself have proven to work out nicely
3.	The service level of Operations towards Sales is in good level
4.	Informing Demand Planners about a potential large opportunity is easy

As seen in Table 3, the interviews revealed that the key stakeholders are fairly satisfied with the current tool itself. The current tool is working fine, and it was found to work well

as a notebook for the case follow up. The simple logic and clear user interface in Share-Point tool support this. Also, the concept of identifying large sales opportunities seems to be accepted by the key stakeholders and they feel confident about it. There is a clear need for the process to support the case Company's business. Below is a direct quote from the interviews.

The tool is good at least from notebook point of view. From the tool I can see the item, quantities, actions done, and then I can update the case with latest information.

Data 1: Respondent 1, Demand Planner

The service level of operations towards sales is seen to be in good level. This means fast replies to lead time enquiries and keeping the delivery promise. Informing Demand Planners about a potential large opportunity is also seen easy because of low barriers in internal communication. However, a number of weaknesses, shown in Table 4, were also found.

Table 4. Weaknesses of the current large opportunity identification process

Identified Weaknesses	
1.	All sales opportunities are not visible for Production Planners.
2.	The quality of large sales opportunity cases and case execution is not standard
3.	Past actions are not always visible in identified large sales opportunity cases
4.	Process of Demand Planners follow-up actions is missing
5.	Closing a large sales opportunity case is not clear enough
6.	Follow up back towards Production Planners is poor
7.	Large sales opportunity criteria are not familiar
8.	Identifying a possible large sales opportunity case is difficult

As seen in Table 4, weakness number 1 is that all large sales opportunities do not create a manufacturing lead time request as per the interviews and questionnaire. Most of the opportunities are only inside the Company's CRM tool, Salesforce, which is not currently used by Production Planners. This creates a gap in sales opportunity knowledge between Sales and Production Planners and reduces the number of opened large sales opportunity cases. The second weakness identified is that the quality of large sales opportunity case and the case execution was not seen standard enough.

As a direct quote from the interviews claims, it is possible that Production Planning does not receive enough information regarding all large sales opportunities.

“There is a real possibility that not all large cases create a Planner Channel case, or it’s created too late. Sales can think that informing Production Planning is not worthwhile because the opportunity details are not yet fully known. Sales can just discuss these issues with Product Manager and leave Production Planning uninformed.”

Data 1: Respondent 2, Head of DSCM

The process of handling an identified large sales opportunity case is clearly seen as a weakness. Past actions by Demand Planners are not always visible at the SharePoint tool, follow up back to Production Planners is seen insufficient and the process of closing a ticket is not clear enough. This supports the earlier comment about there not being enough standardized execution. Another weakness is that the criteria of a large sales opportunity were not familiar enough for the Production Planners, which makes identifying a large sales opportunity difficult.

3.4 Summary of Large Opportunities Identification Process (Data Collection 1)

Four strengths and eight weaknesses were found in the current state analysis.

The tool used for Large Sales Opportunity follow up was found working and the process is found important. Informing Demand Planners about a possible Large Sales Opportunity was also considered easy.

The weaknesses shown in Table 4 are visualized in the Check Lead Time process, Figure 4.

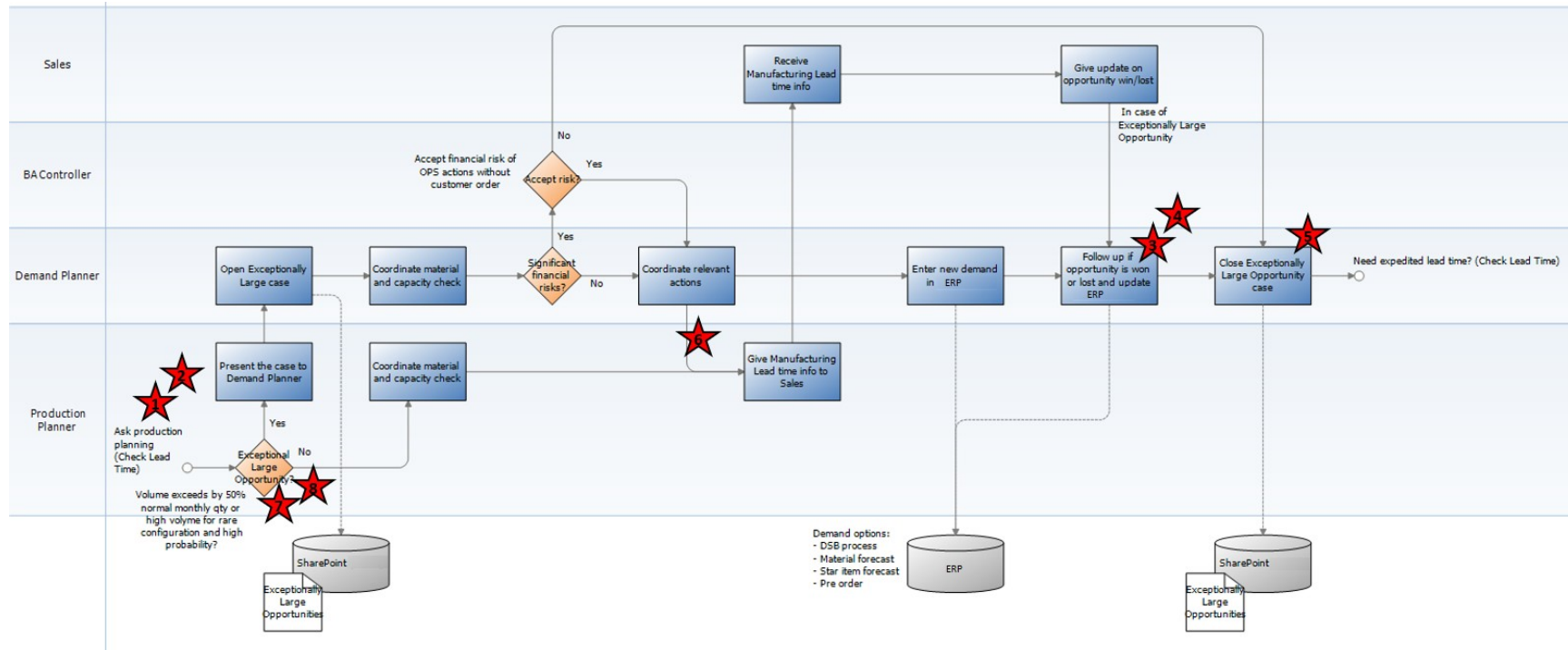


Figure 4. Current check lead time process with identified weaknesses

As seen in Figure 4, most of the identified weaknesses are found in Sales input, identification of a large opportunity and case follow up. Based on the visualization, the identified weaknesses can be summarized by three main concerns:

1. Input to Production Planning does not include all potential large sales opportunities.
2. Identifying a large sales opportunity is difficult and criteria is not familiar.
3. Process of handling an identified large sales opportunity is not clear and standardized enough.

For a successful large opportunity identification is critical to get enough input from the Sales. The process becomes useless and dull without a proper input. Improved and standardized process with clear roles will most likely also improve the organization's ability to identify large sales opportunities.

Therefore, this report focuses on improving the following two main issue: *a) input to production planning does not include all potential large sales opportunities* and *b) process of handling an identified large sales opportunity is not clear and standardized enough*.

The next section studies best practice from literature to build an improved large opportunities identification process based on the findings from the current state analysis.

4 Best Practice of Operative Sales Forecasting and Process Standardization from Relevant Literature

This section discusses the literature findings on demand planning and a better use of sales opportunity data. Also, best practices from literature about process standardization and improving communication is shared.

4.1 Include More Large Sales Opportunities in Input to Production Planning

This section describes what literature says about including more Large Sales Opportunities in input to the case Company's operations.

4.1.1 Demand Planning in General

To begin with, the often-heard term Demand Planning may need some clarification. Stadler et al. (2004: 139-140) summarize Demand Planning by stating that it is about improving the decisions affecting demand accuracy, focusing on forecasting the planned sales. Decisions made in Demand Planning affect the entire supply chain.

Another term worth clarifying is forecasting. The terms forecasting, and planning are often mixed. As per Armstrong (2001: 2), forecasting is needed only when the future is uncertain. You do not for example need to forecast whether tomorrow will come or not. Armstrong (2001:2), also claims that "*Planning concerns what the world should look like, while forecasting is about what it will look like*". This seems like a very clear distinction between the two terms. Armstrong continues that forecasting is not always necessary, and companies can outsource the forecasting responsibility or operate on "just-in-time", where the forecast problem is pushed to suppliers.

Palmatier (2003: 185) has visualized Demand Planning as one part of the continuous cycle of demand management process as shown in Figure 2 below.

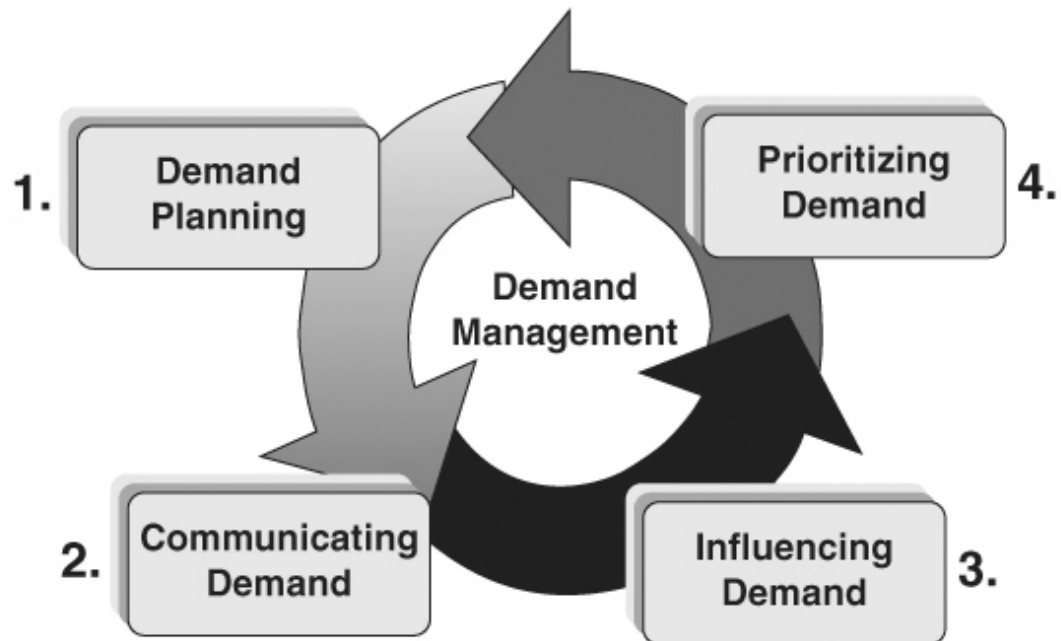


Figure 5. Demand management process model (Palmatier 2003: 185)

As seen in Figure 5 from Palmatier (2003: 185), Demand Planning can be visualized as part of the Demand Management cycle where the actual Demand Planning is just the first step. Demand Planning is followed by communicating the demand to key stakeholders, influencing demand to align it with market needs and prioritizing the customer orders together with the available stock. Palmatier (2003) states that using shipment history as an input to Demand Planning is common but usually results in poor forecast accuracy. In this study, the scope is improving an existing process which is owned by operations organization. Thus, the focus is in Demand Planning and Communicating Demand parts of the process model.

An efficient Demand Planning process, as per Stadtler et al. (2004: 141-142), needs to collect all the available information in the supply chain which might be relevant in communicating the demand to stakeholders. This information might be very specific, aggregated or not always easily available. It is also suggested to include at least three dimensions in the demand plan data: a simple number of predicted sales is not seen enough in most cases. Palmatier (2003: 184-185) adds that a continuing attention to demand planning is required to get the product family and group level input from the Sales & Operations Planning process to a component level demand.

The suggested three dimensions are shown in Figure 3 below.

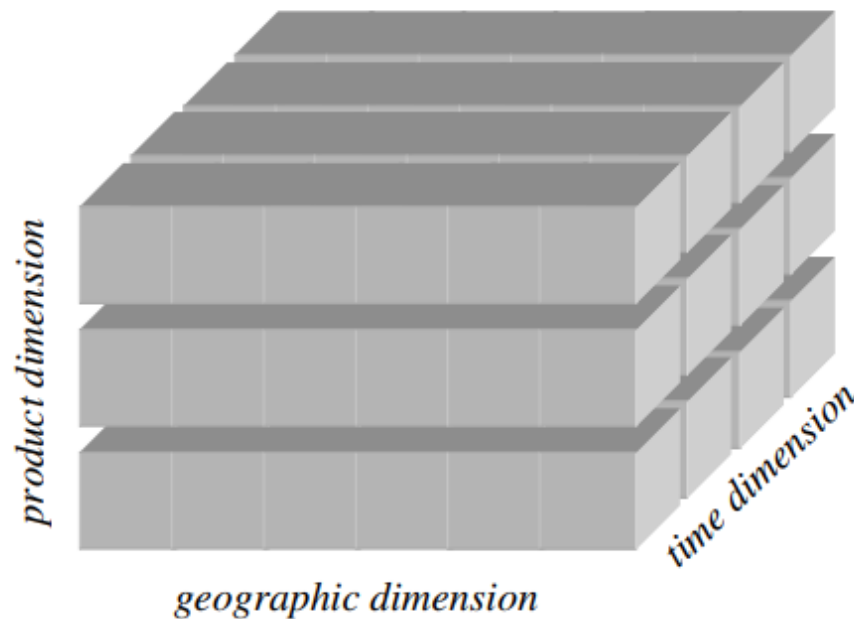


Figure 6. Three-dimensional structure of demand planning data (Stadtler et al. 2004: 142)

The three demand planning dimensions in Figure 6 include product, geographic and time dimensions. When these dimensions are known, the demand plan data can be consolidated to a one simple set of numbers or shaped into a more detailed plan to give more information to the stakeholders and decision makers. Also, the historical data can be further analyzed for further demand plan improvement.

It is also recommended to combine statistical methods and software tools with human support. Statistical methods are great in analyzing the past but information such as promotional activities and new product launches can change the demand remarkably. That is why Stadtler et al. (2004: 149) recommend considering combining both, judgmental and statistical forecasting to achieve more accurate demand plans.

The next chapter focuses on handling and benefitting from the data.

4.1.2 Benefitting from the Sales Opportunity Data

A clear link between sales opportunity data and effective supply chain is not easily found in literature related to sales and CRM, but there seems to be a consensus about the importance of CRM applications in today's Sales processes.

Care et al. (2008:230) define CRM to be simply the best friend of a Sales Engineer. The arguments seem straightforward; CRM is seen to help in standardizing the Sales process, to improve communication, to provide data for further development and to expand the collected data throughout the organization. Care et al. (2008:233) continue with a smart analogy between professional sports and CRM process discipline and repeatability. When a process is well defined and trained, there is no need to start every sales opportunity handling from scratch and use excessive resources. Just as a professional sportsman can do a solid performance easily without learning the basics every time.

Payne (2005:14-15) recommends companies to focus more on the efficient use of CRM systems. According to the book, it is all about collecting and distributing relevant customer information throughout the organization. With the widely shared and well used customer data in a CRM system, a company can fulfill the customer needs better also in the future.

From the red articles, Brenski (2015:177) goes the furthest, stating that the multi-dimensional data in a CRM system clearly benefits a company's supply chain activities. An up to date sales opportunity data can help in improving the demand plan in the company's ERP system.

Figure 7 shows decision points by Palmatier (2003: 198).

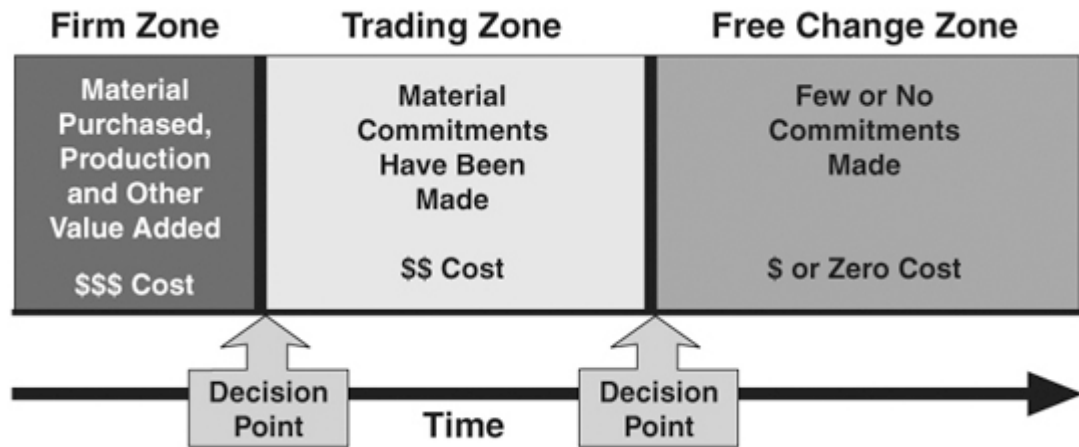


Figure 7. Decision points (Palmatier 2003: 198)

In Figure 7, Palmatier visualizes three different zones of decision making in Demand Planning. The first and closest one is the firm zone, where materials are already purchased, and the cost of change is high. The second zone is called the trading zone which gives more flexibility to changes and material commitments. The third and last zone is the free change zone where only very few or no commitments to suppliers have been made. Changes to demand plan create only small or zero cost. This means that early demand planning decisions increase the supply chain and operations flexibility and can reduce the costs.

As per Care et al. (2008:231-232), the sales opportunities inside a company's CRM system are usually flagged with milestones or probabilities. With the proper use of these milestones, a general rule can be created to help individual Salespersons and even the supply chain. For example, the decision of creating a request for proposal (RFP) could be allowed only after a certain milestone or probability.

The CRM system includes a large amount of data related to customer behavior and future opportunities. According to literature, this data can be used widely inside a company to help in fulfilling customer needs and to improve the company's performance. The identified decision points in the process can improve the data usage in further applications such as demand planning in the ERP system.

4.2 Making Process Clear and More Standardized

This chapter discusses process simplification and standardization as per relevant literature. Since the case company's current Large Sales Opportunity Process is mainly about communication between different teams and employees, the chapter begins with communication related literature, continuing with process standardization.

4.2.1 Improving Communication

As per Yankelevitch and Kuhl (2015:1-5), the importance of clear communication increases in more complex, global business networks. Different languages, time zones and long physical distances create challenges to effective communication. Yankelevitch and Kuhl describe that "*Communication is the next frontier for lean implementation in our global supply chain.*". Their suggestion for improving the complex communication challenges is the use of continuous improvement methodologies, commonly known as lean.

Staats and Upton (2011) have a similar approach, stating that lean principles can be applied to many kinds of knowledge work. They claim that also in so called knowledge operations, it is very important to write down the performed tasks or processes. The focus should be especially targeted on the process steps where tacit knowledge is used. When the process steps are written down, the comparison of actual and expected outcome is easier. This also creates a possibility to create metrics for follow up and improvement.

Yankelevitch et al. (2015:9-10) points out that any variance in the communication between sender and recipients should be minimized or zero. One possible cause for variation is the communication method. Is the information exchange done verbally 1on1, with private e-mails or inside a shared IT platform? Good quality communication increases the value of the process and reduces waste.

In his article about Human-Driven Processes, Harrison-Broninski (2010:448) lists five principles that should be considered when building effective human processes. First, the roles and responsibilities must be clear to each process participant. Second, the communication in a process must be well structured with defined communication methods. Third, encouraging workers to use their knowledge and convert it into ideas should be considered. Fourth, allowing flexibility and autonomy in people's time management can

increase the work efficiency. Fifth, the process should be built together with the team and it should be revised and even changed over time.

Clear roles and responsibilities along with well-defined communication steps and tools seem to be at the core of good communication.

4.2.2 Process Standardization

Vom Borcke et al. (2010:310-311) identify the challenges that global organizations bring into the process standardization. Long geographical distance, different cultures and environments can create difficulties in process standardization. Vom Borcke et al. state that cure for the problem is to accept a reasonable local autonomy depending on the case.

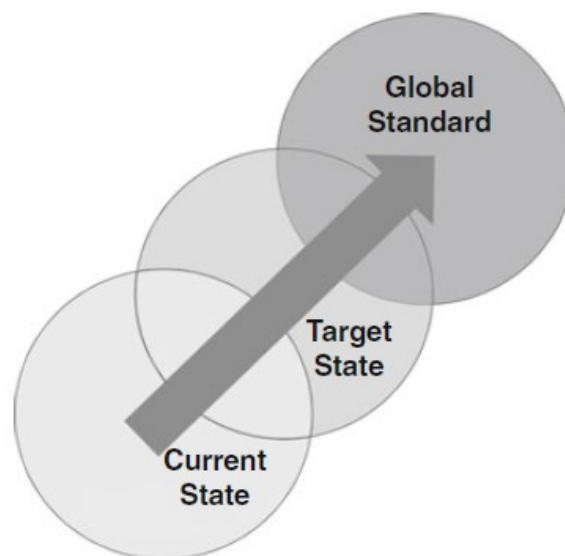


Figure 8. Levels of process standardization (Vom Brocke et al. 2010:317)

As shown in Figure 8, the Vom Brocke et al (2010:317) visualize the locally unique process features in three different steps. First, there is the current state, which is the starting point for process development. Secondly, a Target State is the level with reasonable local autonomy in the process. Thirdly, Global Standard represents the visionary state for processes in all units globally.

Vom Brocke et al. (2015:314-315) continue to list possible reasons for business process variations. The list includes reasons such as legal requirements, local market features,

individual choices, potential loss of power, natural drift over time and resource related constraints. One interesting finding about variation causes is an often-heard comment that a process step is so unique or complex that it cannot be standardized. This claim is found not true in most of the cases. Staats et al. (2015:60) second this by stating that some aspects of a process can always be standardized.

The analyzed literature sources seem to count on Lean Methodologies in also process standardization. A standard way of doing things makes the process step changes easier, creates a standard output and it also minimizes the process variation.

According to Staats et al. (2011), process standardization is one of the key fundamentals also in the famous Toyota Production System (TPS). They identify Value Stream Map (VSM) as an important part of process standardization, yet it is usually just a high-level description of a process. More detailed information of each process step can be achieved with Standard Work documents, which they also recommend.

Staats et al. (2011) continue that standardizing work might not always seem obvious for so called knowledge work but much of knowledge work can still be specified and written down. This can be gained with thorough interviews of the key persons.

Standard Work includes precise tasks, in a specific order, with locations, number of operators and average time used. Although the figure shows a physical workflow in operations, the Standard Work sheet can also be used in documenting and standardizing office processes. In addition, Standard Work is useful when introducing new workers to their tasks.

4.3 Conceptual Framework of This Thesis

The literature research provided some tools and findings that could improve the case company's demand planning, help in using sales opportunity data, improve communication and standardize the process. All the relevant findings are summarized into a conceptual framework shown in Figure 9.

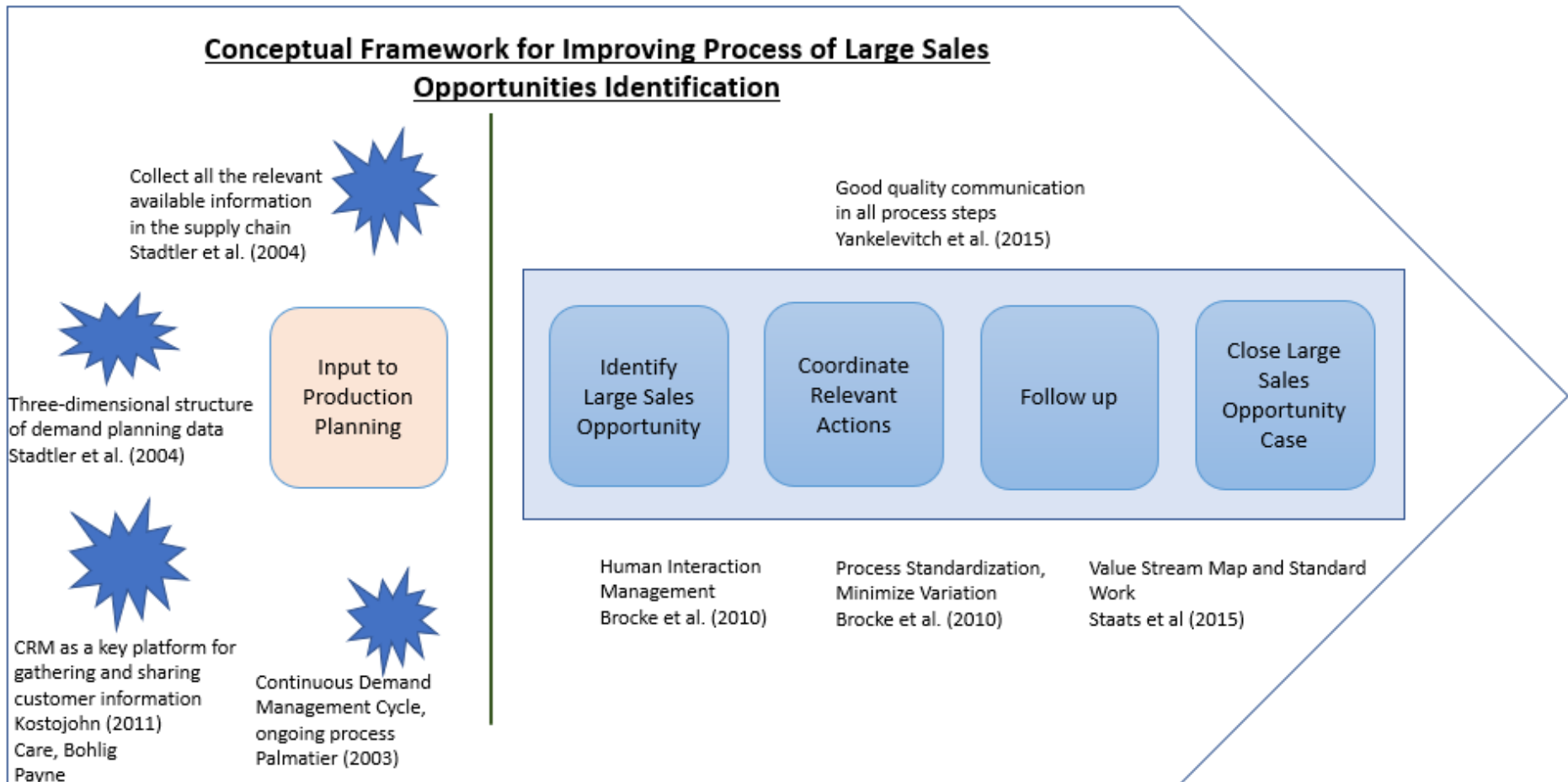


Figure 9. Conceptual framework of this study

As seen in Figure 9, the conceptual framework is divided into two main topics. Firstly, Demand Planning is part of the continuous Demand Management cycle that can and should be modified according to the customer demand changes. The conceptual framework suggests that the input to Production Planning should include all the relevant information in at least three-dimensional structure. Usually the three dimensions are time, product and geography. Good use of the company's CRM system is also mentioned in the conceptual framework. The CRM data usually includes information about customer and opportunity data, which can be further used in improving the demand plan quality.

Also, the conceptual framework includes precise and detailed communication, with defined responsibilities and tools. This helps reduce the unwanted variation in communication and remove waste and misunderstandings inside the process. Process standardization can be improved by using Lean Methodologies, such as Value Stream Map (VSM) and Standard Work tools.

As per the built conceptual framework, shown in Figure 9, and input from the current state analysis, an improved process for Identifying Large Sales Opportunities in case Company is presented in the next chapter.

5 Developing and Improving Large Sales Opportunity Identification Process Based on Conceptual Framework

This section merges the results of the current state analysis and the conceptual framework towards the building of the proposal with key stakeholders mentioned in Data 2.

5.1 Outline of This Data Stage

Based on the current state analysis in chapter 3, the two main weaknesses needing improvement were:

- 1) input to production planning does not include all potential large sales opportunities*
- and
- 2) process of handling an identified large sales opportunity is not clear and standardized enough.*

To build an Initial Proposal for Improving Large Sales Opportunity Identification Process, Data Collection 2 was conducted as a common proposal building session together with a Demand Planner and two Production Planners.

The results of the current state analysis, the built conceptual framework and improvement ideas rising from literature were presented to attendees. It was followed by a fruitful discussion about the literature findings and the suggested improvements to the problem as described in the following subsections.

5.2 Findings of Data Collection 2

The commonly agreed suggestions of the key stakeholders are presented in Table 5 below.

Table 5. Key stakeholder suggestions for proposal building (Data 2) in relation to findings from the Current State Analysis (Data 1) and the key elements of Conceptual Framework.

	Key focus area from Current State Analysis	Suggestions from stakeholders, categorized into groups (Data 2)	Description of the suggestion
1	Input to production planning does not include all potential large sales opportunities	<p>a) Find out how we can utilize the current reports of sales opportunity data more in our work.</p> <p>b) After utilizing current possibilities, we should work with IT to develop the process to be more real time.</p> <p>c) If the data quality is found poor, start to work with sales to improve it.</p>	<p>Demand Planner suggested to revise the current sales opportunity data and find if it can be utilized and further developed together with IT</p> <p>Demand Planner also noted that the current sales opportunity data quality might not be good enough for making decisions.</p>
2	Process of handling an identified large sales opportunity is not clear and standardized enough.	<p>a) Work instructions for Production Planners must be created.</p> <p>b) Automatic updates to Production Planners.</p> <p>c) Due date alerts to Demand Planners.</p>	<p>Production Planner 1 said that clear work instructions for Production Planners are needed. She also made an idea of automatic updates to Production Planners.</p> <p>Demand Planner took the idea further and suggested alerts for due dates to help the regular follow up.</p>

5.3 Initial Proposal of Improvements to the Check Lead Time Process

Based on the Data Collection 2 in chapter 5.2, an initial proposal of improvements to the Check Lead Time Process was created. The proposal is seen in Figure 10 below and the following two subsections describe the proposal in details.

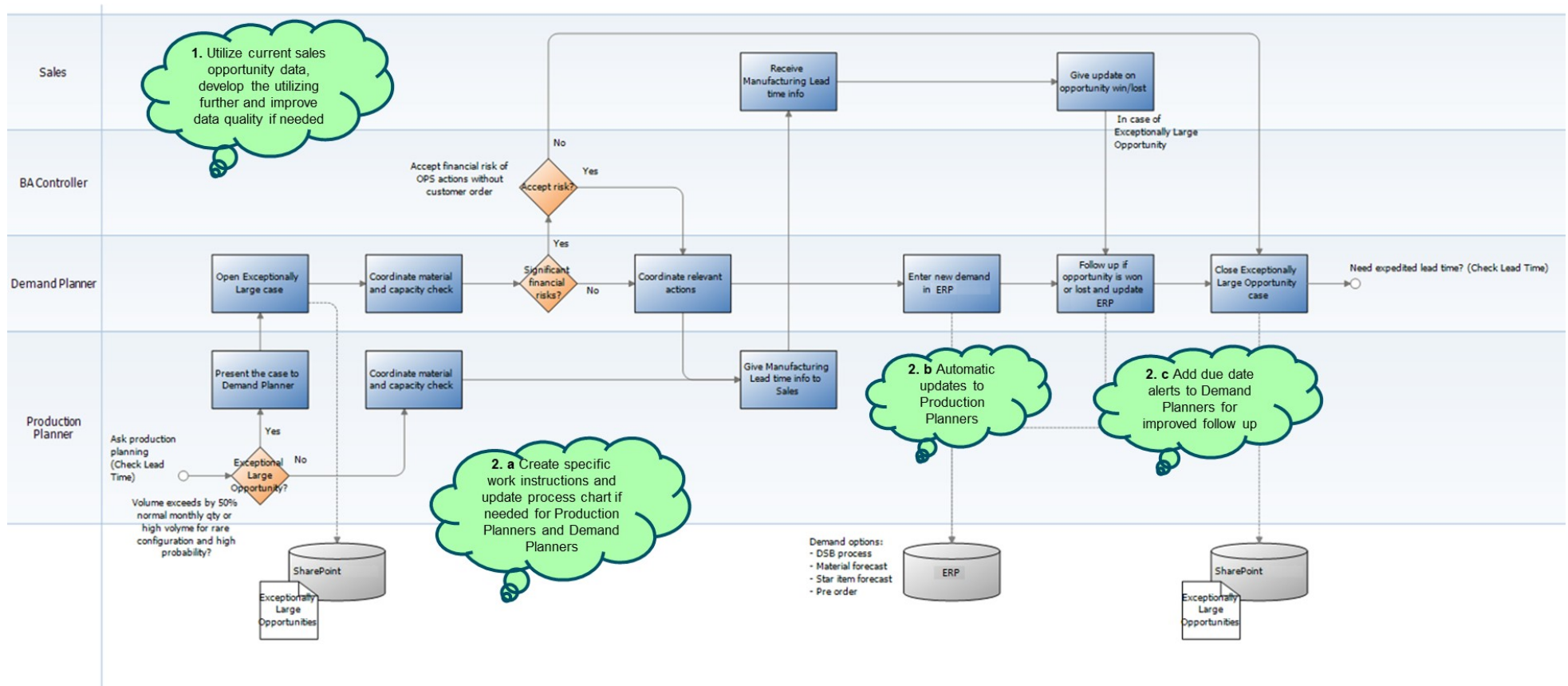


Figure 10. Initial Proposal of Improvements to the Check Lead Time Process

5.3.1 Improve the Input to Production Planning

The group agreed with the ideas based on the Conceptual Framework and suggested that the focus should be more on the currently available sales opportunity data. According to the Demand Planner, much data is already available from the sales pipeline for further use. It would be beneficial to find out if the Company can somehow benefit from the sales opportunity data with current tools and processes. After the first experiences of benefiting from the data, a discussion with Company's IT should be started to have a more automated and responsive way of getting the needed information and desired benefits.

The Demand Planner also noted that the current sales opportunity data quality might not be good enough for making decisions that has an immediate effect on the Company's material demand. We commonly agreed to flag this problem to Sales if opportunity data quality is noticed to be poor.

Figure 10 in chapter 5.3 shows the proposal for Production Planning input improvement as improvement 1.

5.3.2 Standardize the Process

Standardizing the process was seen commonly important and the Conceptual Framework suggestions support this.

We reviewed the current process chart with key stakeholders and the Demand Planner commented that we need a more detailed process chart of Large Sales Opportunity identification.

Production Planner 1 said that simple and detailed work instructions for Production Planners are needed. According to her, Production Planners face several potential issues every week but due to the process unclarities, many of the opportunities are not further analyzed from the large sales opportunity perspective. She also came up with an idea of automatic updates to Production Planners. Every update of an identified Large Sales Opportunity could be sent automatically to the relevant Production Planner. This was commonly seen to improve the communication related to large sales opportunities. The

Demand Planner took the idea further and suggested automatic e-mail at due dates to Demand Planners to help the follow up. The e-mail alerts would help Demand Planners keep the identified large sales opportunities up to date regularly and prevent them to be forgotten for a long period of time.

These improvements can be seen in Figure 10 as improvements 2 a, 2 b and 2c.

5.4 Summary of Proposed Process

Figure 10 in chapter 5.3 visualizes the proposed improvements to be included in the current Check Lead Time process. The shown proposals are originated from a proposal building session held together with one Demand Planner and two Production Planners. As per the proposal building session, the proposed improvements would improve the large sales opportunity identification process according to the study objectives.

As seen in Step 1 in Figure 10, the Company should first try more to utilize the current sales opportunity data and develop the usage and/or data quality if needed. Step 2 a proposes more specific work instructions and an updated process chart for improved clarity amongst the key stakeholders. In step 2 b, the automatic updates are proposed for improving the communication towards Production Planners and in step 2 c, due date and related alerts to Demand Planner are proposed to improve the follow-up.

Management validation, which leads to the final proposal, is presented in the next section.

6 Validation of Proposal for Improving Large Sales Opportunity Identification Process

This section reports the results of the validation stage and points out further development ideas to the initial proposal based on a feedback session held together with Head of Demand and Supply Chain Management. At the end of this section, the final proposal is presented.

6.1 Outline of the Data Stage

The validation of the proposed improvements to large sales opportunity identification process was done by presenting the research findings to The Head of Demand and Supply Chain Management. The aim of the session was to get feedback on the proposal and receive further development ideas for building the final proposal.

The research problem and conceptual framework and the results of the initial proposal building session were introduced to the Head of Demand and Supply Management. Feedback and development ideas were collected to build the final proposal of the study. Field notes from the session can be found in Appendix 5.

6.2 Feedback and Development Ideas from Management

A summary of Data 3, the feedback and development ideas from management, is shown in Table 6 below.

Table 6. Summary of Data 3

		Management comments
1	Feedback of the proposed improvements	<p>The proposed improvements should take us into the right direction, good job!</p> <p>Setting up alerts and defining the process more detailed will help in process standardization. Creating a detailed work instruction for the stakeholders can also reveal yet unknown gaps in the process.</p> <p>Benefiting from the current sales opportunity data is a good idea but the data should be treated critically. Businesses own the data and are responsible about the development. Our role is to point out the improvement needs and support them while doing improvements.</p>
2	Further development ideas	<p>Measuring quality of the process would be very beneficial. Could we define the capacity of major products by using 80/20 rule and analyze order history data accordingly? This would give us a numerical information about the process status.</p> <p>Improving the sales opportunity data can be difficult, since businesses own the data and tools. We should motivate them somehow to improve the data quality if needed. Bringing the large opportunity highlights to in monthly S&OP Demand Review meeting discussions would increase the focus of data quality.</p>

Overall, the comments from the validation were positive with a few improvement ideas. The improvement ideas focused on measuring the process and helping the businesses to improve the quality of sales opportunity data. These improvement ideas fit well into the conceptual framework of the Study and will be added into final proposal.

6.3 Lessons Learned and Needed Corrections Made

This section summarizes the lessons learned and lists the corrections made into the proposal based on the feedback from management.

6.3.1 Measuring the Large Sales Opportunities Identification

As per management feedback in Data 3, measuring the process would help the Company understand the current status of the process. Measuring the process would also help when the process is further improved.

Process measurement could be built by following the two steps mentioned below:

- 1) Production Planners should identify the manufacturing capacity of the most important products. Weekly manufacturing capacity works here as a key for identifying exceptionally large sales opportunities.
- 2) The identified weekly manufacturing capacity will be used to spot exceptionally large sales opportunities from the sales order history data.

A monthly updated metrics should be built to show the rate of identified exceptionally large sales opportunities. The metrics would compare order history to identified products manufacturing capacity.

6.3.2 Including the Sales Opportunity Data to S&OP Process

Management feedback also suggests bringing the CRM sales opportunity data into the monthly S&OP process discussion. This would increase the focus and awareness of the data quality but also help in identifying the actual large opportunities and improve the demand plan quality.

The Company should use manufacturing capacity identified in the previous chapter also in S&OP tools to highlight large sales opportunities for the Sales Managers and S&OP process stakeholders. Demand Planners should bring the identified large sales opportunities into discussion in S&OP Demand Review meetings. Demand Review meetings include the Heads of Business Areas, Head of Manufacturing and Vice President of Business Area, so this will increase the focus on CRM data quality. This would most likely motivate the businesses and Sales Managers to keep the CRM sales opportunity data more up to date.

6.4 Summary of Final Proposal

Based on the management validation in Data 3, the final proposal is built. Figure 11 below visualizes the final proposal where improvements based on the validation session are added to drawing as Step 3.a. and Step 3.b.

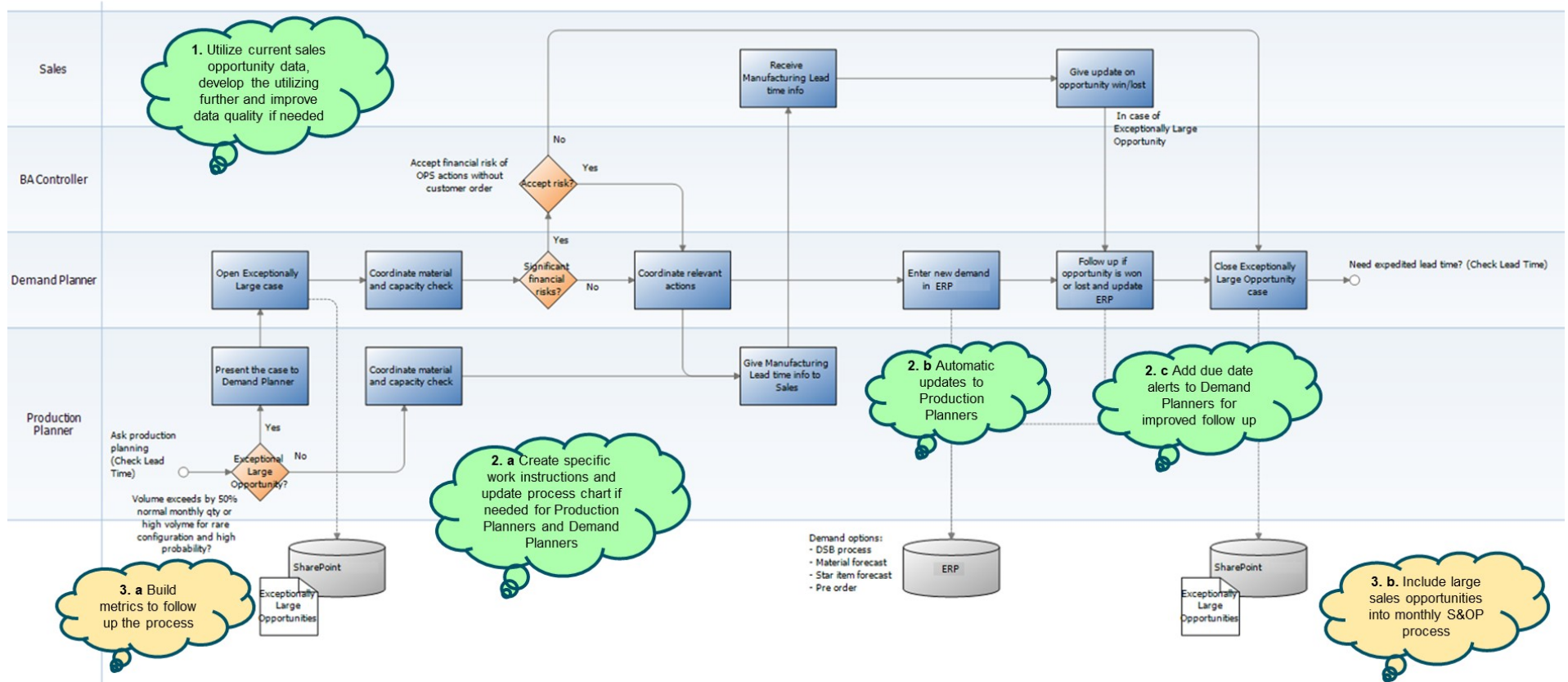


Figure 11. Check lead time process with final improvements

Step 1 suggests the Company to utilize current sales opportunity data more and improve the data quality if needed. Step 2a. is about creating improved and detailed work instructions for production planners and demand planners. This is the key in standardizing the process. In step 2 b, the automatic alerts to process participants are created and in step 2 c, the due dates are set to get a schedule and deadline for the updates.

Further development ideas from the management feedback session are shown as steps 3a and 3b. Step 3a. is about the need to measure the process. Measuring the process will help in understanding the current status but it also will show the progress of all development actions. Step 3b. is related to bringing CRM sales opportunity data more visible to key stakeholders of S&OP process. This step will increase the awareness of CRM data quality.

This completes the validation section of this study. The next section summarizes the study.

7 Discussion and Conclusions

In this section, the study is summarized, and further actions are proposed.

7.1 Executive Summary

The case Company considers its business model as high mix-low volume, which creates importance to demand plan accuracy due to a high number of configured products with rather low volumes. A poor demand plan can create extra costs to the supply chain or even problems to customer deliveries. The Company has a process in place for identifying large sales opportunities, but it has been found inefficient, and many large sales opportunities might be continuously missed. The objective of this study was to develop an improved large opportunities identification process.

This study was conducted in five steps. In the first step, a current state analysis was conducted to find out strengths and weaknesses of the current large sales opportunity identification process. This was done by interviewing key stakeholders of the process and hosting a survey to production planners who are the key personnel in identifying such opportunities. The strengths and weaknesses were listed and mapped to a Check Lead Time process chart to visualize the pros and cons of the current process. Most of the identified weaknesses were related to large sales opportunity identification or to an observation that the process was not standardized enough. The identified weaknesses created a framework for the upcoming literature research.

The second step of the study was to find out good practices from literature about operative sales forecasting and process standardization. The main findings from the literature were related to benefiting more from the current sales opportunity data in the CRM system. In many cases, it already includes the required dimensions and needed information – companies just need to find out a proper and beneficial way to use it. Literature findings about process standardization buzzed around good quality communication in each step process and using Lean methodologies, such as value stream map and standard work tools. The current state analysis informed the building of the conceptual framework, which visualizes the key findings from relevant literature.

In the third step, the conceptual framework was used to develop a proposal for improved process together with key stakeholders, including two production planners and a demand planner. The total of four improvements to the current process was mutually agreed based on the conceptual framework. Firstly, a better usage of current CRM sales opportunity data was seen important. Secondly, more specific work instructions to production planners and demand planners was agreed. The third and fourth improvement was about improving information sharing via automatic e-mail alerts and adding due date alerts to Demand Planners improved follow up.

The fourth step of the study was about validating the proposal with management in a 1on1 discussion. The proposed improvements were seen to be aligned to study targets and to take the Company's large sales opportunity identification process to the correct direction. Also, further development ideas were presented in this session. The management saw the process as an important aspect when doing process development. Bringing CRM sales opportunity data from CRM into S&OP process to increase the general awareness and focus was also seen important.

In the fifth step, the feedback from management was included into the preliminary proposal and the final proposal was formatted. The final proposal includes a better usage of current sales opportunity data in CRM, standardizing process with work instructions, alerts of updates and due date reminders are included. The final proposal includes also creating metrics to understand the process status. It also includes the link to S&OP process meetings to raise discussion and general understanding of the current status of the quality of CRM sales opportunity data. Improvements for creating metrics and bringing CRM sales opportunities into S&OP meetings are originated from the management feedback session.

Implementing the proposed development actions, is likely to help standardize the process, make it more efficient and improve the quality of the Company's CRM sales opportunity data. This is believed to improve the Company's ability to react to large sales opportunities with the help of the improved demand plan.

7.2 Next Steps Towards Implementation

The improvements in the final proposal are suggested to be implemented. Most of the improvements are rather simple and do not require extensive resources or investments. Also, the improvements can be done gradually, analyzing the effects one by one.

First, the metrics for measuring the large sales opportunities identification process should be considered. Creating and implementing the metrics first will give the Company feedback about the current process status and help in monitoring the progress of further improvements. Second, the more detailed work instructions and an updated process chart creation is proposed. This will help in process standardization and will eventually create a common goal for the key stakeholders. Third, adding automatic alerts is proposed as well as due dates to the follow up tool. These are simple modifications to the SharePoint tool. The fourth and final step recommended is to include the current sales opportunities in the Company's S&OP process. This will require some development work to current S&OP tools and a process but will be worth the effort due to increased awareness about the sales opportunity data status.

7.3 Thesis Evaluation

A systematic approach was used to meet the business challenge objective of developing an improved large opportunities identification process. As per Kananen (2013: 177) one of the fundamental aspects of a scientific research is the credibility of the sources. If the source data is faulty or misleading, even the good practices in data collection or analysis will not help. Therefore, it is important to perform the research in a good scientific manner with no issues regarding validity, reliability, logic or relevance.

7.3.1 Validity

Validity is about researching the correct things in a way that the results can be used universally (Kananen 2013: 189). As per Patton (2001:247), using multiple data points and combining qualitative and quantitative data can increase the research validity.

The validity of this report was secured by collecting data from several different stakeholders from different organizations and organization levels. Data was collected in several interviews, survey and e-mail questionnaires to gain a holistic overview of the current situation.

7.3.2 Reliability

Kananen (2013: 189) states that a reliable research has consistent results of data collection, so that the same results would be received if the research would be repeated. Even more demanding criteria for reliable research is given by Yin (2009:45) as he states that the same results should be received even with a different researcher.

In this study, the same set of questions was asked from stakeholders that were participating at the same stage of the Large Sales Opportunity identification process. The interviews were recorded and documented in a proper manner and were held prior to the literature review to ensure reliability.

This leaves some room for improvement. Creating a well-prepared question list and agenda to every interview would have increased the rate of reliability. Some interviews were lacking a well-planned structure and ended up being surprisingly productive although poorly structured discussion.

7.3.3 Logic

The logic of this report was secured by starting from the current state analysis with the target of identifying the strengths and weaknesses of the current process from key stakeholder interviews and data analysis. Solutions for the identified strengths and weaknesses were then further investigated from relevant literature and as a result, best practices from the literature review were proposed to be taken into use. The process validation and improvement actions were the last step of this research.

7.3.4 Relevance

This research was conducted due to actual problems in the case the company's current Large Sales Opportunity identification process. The process was found to be inefficient and it may have created extra costs throughout the company's operations and even lost sales. Therefore, it was very relevant for the case company to research the process, find out the strengths and weaknesses and study relevant literature. The proposal for the

improved process was co-created with key stakeholders and the findings of the current state analysis. The proposal was discussed with the company management to make sure that the solution is relevant and further development ideas from management were taken into account when building the final proposal.

7.4 Epilogue

This research aimed to improve the demand plan quality of a Company working in a very demanding global high mix-low volume business. Based on the current state analysis and literature research, some practical improvement ideas were proposed with help of current data, improved communication and process standardization.

The case Company has an inside joke that *“If this business would be easy, everyone would be doing it”*. This pretty much summarizes the high mix-low volume environment and the challenges related to it. There is no one and easy solution to fix everything at once. Small gradual improvements and continuous monitoring of the process are the key to success.

There is still much to develop in the large sales opportunities identification process and the work will most likely continue after these improvements have been implemented and analyzed.

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