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# Improving Case Company Additional Order Process

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## Foreword

I got my bachelor's degree in 2010 and at the end of 2020 I decided to study some more. The main reason for getting back to school was to challenge myself if I can manage work, school and family life at the same time. Of course, getting the master's degree to help with the career development was a big motivation as well. Now, after nine months of intense studying, it feels very weird that graduation from master's degree programme will be in June 2022.

I would like to thank the case company for giving me an opportunity and time to complete my studies. Thesis subject provided by the case company was interesting and hopefully the end results will benefit the company. I would like to thank all stakeholders who were involved in the interviews, workshops and meeting during the thesis. A special thanks to my supervisor Lauri, who provided good ideas for the thesis and flexibility with work.

I would like to thank Dr. Thomas Rohweder, my thesis supervisor, for all his advice and encouraging criticism. Thank you also to M.A. Sonja Holappa for all your efforts in guiding my professional language and providing constructive criticism and feedback. I'd want to express my gratitude to all the teachers for their excellent lectures and the Industrial Management study program's framework. Dr. Juha Haimala, Dr. James Collins, and Dr. Thomas Rohweder deserve special thanks. Also, thanks to my classmates for their peer support and successful group projects.

The biggest thanks go to Laura, whom without I couldn't have managed to complete the studies. I would like to thank all my family and friends who I will see much more after completing the studies.

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## Abstract

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The objective of this thesis was to improve the additional order process in the case company's Marine & Offshore projects. The additional order sales are done during the project execution phase. The additional orders form a significant part of the case company's marine business revenue and the process has several defects, which needed improving.

The selected research approach for this thesis was design research and qualitative methods were used for data collection. The thesis includes four main stages. The first stage was a current state analysis and the outcome from that was the strengths and the weaknesses of the additional order process. The summary of the strengths and the weaknesses created the basis for which weaknesses to improve in this thesis. The second stage was to find improvement ideas to the additional order process weaknesses from the relevant literature to form the conceptual framework. The third step was to create the initial proposal to improve the additional order process based on the weaknesses and ideas from the conceptual framework. The fourth step was to validate the initial proposal with the management to get feedback for the final proposal.

Final proposal included the additional order process map, process improvement recommendations, process owner's activities and KPIs. Improvement suggestions were done for five different additional order process steps. Five process owner's activities were created and four additional order process KPIs were concluded.

The final proposal gives general level solutions to most of the weaknesses discovered from the current state analysis. The proposal has useful improvement suggestions, which can be implemented quite easily. Once improvements are in place, process owner's activities and KPIs can be fully implemented. Process map is useful for new employees and it can be easily modified to some other form if needed. The additional order process map, improvement suggestions, process owner's activities and KPIs give a good starting point for further process development.

Keywords: Business Process Management, Additional Order, Business Process Improvement, Project Sales, Process Map

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## **List of Abbreviations**

BPM:	Business Process Management
CSA:	Current State Analysis
iScala:	Case company's ERP system
KPI:	Key Performance Indicator
M-files:	Case company's file management system
PEMM:	Process and Enterprise Maturity Model
SOLE:	Case company's project finance system
WFMA:	Workflow Mapping and Analysis Method

# 1 Introduction

Additional orders during project execution phase are becoming an increasingly important part of the project profitability due to growing competition in the fire protection industry. The Finland based case company delivers fire protection solutions globally to land and marine industries. In the marine project deliveries, additional orders form a significant part of the project sales and have a positive impact on the project profitability. Therefore, the process of how the additional orders is executed should be simple, effective and informative to all stakeholders.

This thesis focuses on improving the current additional order process during the marine project deliveries. Considering the economic significance of the additional orders, the current additional order process affects negatively the stakeholders and on the profitability in some extent. The additional order sales is handled in the project department and not in the sales department, therefore the sales department has been excluded from the development processes. This fact leaves plenty of room for the additional order process improvements.

## 1.1 Business Context

The case company is a leading developer and innovator of water mist fire protection systems. The fire protection solutions are supplied worldwide. The case company has a head office and factory in Finland and subsidiaries are in France, Germany, Italy, Russia, Spain, Sweden and UK. The customers are served globally through distributors and certified partners. The company competes against other water mist fire protection system providers and against traditional sprinkler system providers. The case company's strategic priority is to remain the customers' 1<sup>st</sup> choice in water mist fire protection solutions and lifecycle services.

The case company has two main business units, which are land and marine. The Land Business Unit provides water mist fire protection solutions for buildings and



industry & energy sectors and The Marine Business Unit is providing solutions for the marine & offshore sectors. Land and marine suppression solutions are delivered globally as a turnkey delivery, project delivery or material delivery. Marine deliveries are turnkey or project deliveries including at least materials and project design. Marine projects are usually delivered to shipyards or to local distributors and there is not much communication with the end-customers or shipping companies.

## 1.2 Business Challenge, Objective and Outcome

A lot of sales take place during the marine project execution phase with the additional orders. When there are changes in the marine projects during the execution phase, the materials and services needed are quoted and delivered to the customer forming the additional order. The marine project managers are responsible for the additional orders within their own projects. Now, the additional order process is not working as it should during the marine project deliveries.

The additional order process has issues from quoting to financial reporting and it is not consistent. There is no process description available and there are no documented guidelines or instructions of how to proceed with the additional orders. Each project manager has their own way of processing the additional orders. The lack of a consistent process within the additional orders has negative impacts on all stakeholders and profitability.

The marine project department is a part of the case company's Marine Business Unit and it consists of project managers who take care of the new build projects and upgrade project managers who take care of the upgrade projects. The team is supervised by a Senior Manager, Projects. Each new build project manager has their own customers, which are usually shipyards or sometimes case company's distributors. The author of this thesis is the project manager for new build marine projects.

The objective of this thesis is to improve the current additional order process in marine & offshore projects. The outcome of this thesis is the improved additional order process.

### 1.3 Thesis Scope and Outline

The scope of this thesis is to improve the current additional order process in marine & offshore projects and this only includes improvements to the new build projects' additional order process. Any other Marine Business Unit or Land Business Unit entity is not included in this thesis. Also, marine upgrade projects have been excluded from this thesis, because the additional orders are not a relevant part of that business area.

This thesis is written in seven sections. The first section introduces the subject of this study. The second section deals with the project plan including research approach, research design and data plan. The third section is the current state analysis of the current additional order process with the summary of the current process' strengths and weaknesses. The fourth section consists of improvement ideas from relevant literature and conceptual framework. In the fifth section, the initial proposal of the improved additional order process is introduced. The sixth section deals with the validation and improvements for the initial proposal forming the final proposal. Finally, in the seventh section, the final proposal's validity and reliability are discussed.

## 2 Project Plan

The previous section introduced the business challenge, objective and outcome. This section describes the selected research approach, research design and data plan.

### 2.1 Research Approach

There are two different research approaches, which are basic research and applied research. Basic research is conducted to understand processes of business and management and their outcomes in a very theoretical level. This type of research is done in universities and it is intended mainly for academic communities. Applied research aims for more practical consequences and it is relevant to managers. It is presented in a way that it is easy to understand and to act on (Saunders et al. 2012). Therefore, applied research approach was selected for this thesis, because of the practical nature of the business problem.

There are different ways of conducting applied research. According to Kananen (2013: 20-21) “Design research produces functional and practical solutions”, “combines development and research” and “is conducted in organizations in order to improve operations”. Design research was selected on this thesis due to the practical nature of the business problem. Also, the objective and outcome of this thesis aim to improve business operations. In the study, qualitative methods were used for data collection.

### 2.2 Research Design

This subsection presents the research design used in this thesis. Figure 1 shows the research design as a flow chart. The research design has a total of five steps starting from the objective definition and ending in the outcome of the final proposal of the improved additional order process. Data was gathered in three different steps and the outcome is the result of each step after objective definition. Data is discussed more in detail in section 2.3.

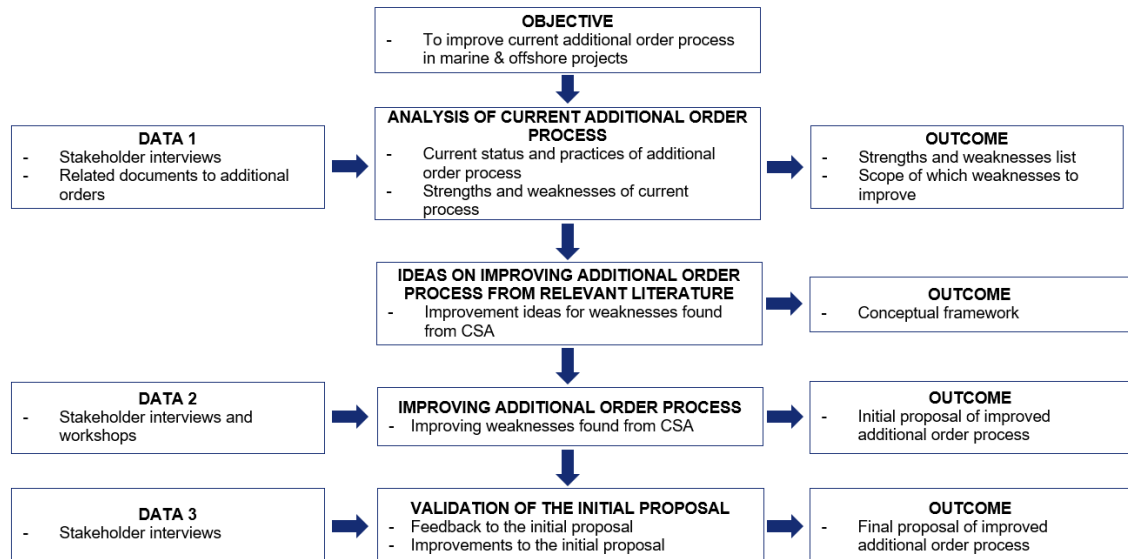


Figure 1. Research design

As shown in Figure 1, the current state analysis was the first thing to do after setting the thesis objective. The CSA was started by arranging interviews with the key stakeholders, which formed Data 1. There was not any useful documentation available to be used in the thesis, the CSA is based purely on the interviews. The interviews were analysed for the outcome of this stage, which included the strengths and the weaknesses lists and a scope of which weaknesses to improve.

The third step in Figure 1 is finding ideas from relevant literature to improve the additional order process. The literature concerned the weaknesses found in the CSA. The outcome of the literature research is the conceptual framework of this study, which summarizes the ideas to be implemented in the next step.

The fourth step was to put the conceptual framework to practice. Ideas from the framework were utilized in two workshops arranged with the key stakeholders forming Data 2. The information gathered from the workshops was used to make the initial proposal for the improved additional order process.

The last step was the validation procedure for the initial proposal created in the previous step. A meeting was arranged with the management to collect feedback for the initial proposal and Data 3 was gathered from this meeting. Data 3 was used to adjust the initial proposal to make the final proposal of this thesis.

## 2.3 Data Plan

This section presents the data collected for this study. Data was collected in three stages of the study and it contains mainly interviews and workshops. The data collected is divided to Data 1-3 and descriptions of the data stages can be seen in Table 1.

Table 1. Data plan

DATA ROUND	DATA CONTENT	DATA TYPE	DATA SOURCE	TIMING	OUTCOME
<b>DATA 1</b> <b>ANALYSIS OF CURRENT ADDITIONAL ORDER PROCESS</b>	<ul style="list-style-type: none"> <li>- Current status and practices of additional order process</li> <li>- Strengths and weaknesses of current process</li> </ul>	<ul style="list-style-type: none"> <li>- Stakeholder interviews</li> <li>- Related documents to additional orders</li> </ul>	<ul style="list-style-type: none"> <li>- Marine Project Managers</li> <li>- Senior Manager, Marine Projects</li> <li>- Director, Marine Business Unit (if needed)</li> <li>- Additional order documents from different Project Managers</li> </ul>	JANUARY	<ul style="list-style-type: none"> <li>- Strengths and weaknesses list</li> <li>- Scope of which weaknesses to improve</li> </ul>
<b>DATA 2</b> <b>IMPROVING CURRENT ADDITIONAL ORDER PROCESS</b>	<ul style="list-style-type: none"> <li>- Improvement ideas for weaknesses found from CSA</li> </ul>	<ul style="list-style-type: none"> <li>- Stakeholder interviews and workshops</li> </ul>	<ul style="list-style-type: none"> <li>- Marine Project Managers</li> <li>- Senior Manager, Marine Projects</li> <li>- Director, Marine Business Unit (if needed)</li> </ul>	MARCH	<ul style="list-style-type: none"> <li>- Initial proposal of improved additional order process</li> </ul>
<b>DATA 3</b> <b>VALIDATION OF THE INITIAL PROPOSAL</b>	<ul style="list-style-type: none"> <li>- Feedback to the initial proposal</li> <li>- Improvements to the initial proposal</li> </ul>	<ul style="list-style-type: none"> <li>- Stakeholder interviews</li> </ul>	<ul style="list-style-type: none"> <li>- Marine Project Managers</li> <li>- Senior Manager, Marine Projects</li> <li>- Director, Marine Business Unit (if needed)</li> </ul>	APRIL	<ul style="list-style-type: none"> <li>- Final proposal of improved additional order process</li> </ul>

As seen in Table 1, the data sources were the same for all different data stages. The current documentation was used only if there was any documentation available and Director of Marine Business Unit was to be interviewed only if needed. The interviewees were selected from the marine project management team as the main idea of this study was to make the improvements to benefit the new build project managers. That is the main reason why personnel from the other departments such as sales or engineering were not interviewed. Table 2 shows the details for Data 1 collection.

Table 2. Data 1 collection

<b>DATA 1 - CURRENT STATE ANALYSIS</b>						
<b>#</b>	<b>Source</b>	<b>Data Type</b>	<b>Topic</b>	<b>Date</b>	<b>Lenght</b>	<b>Documents</b>
1	Senior Manager, Projects	Teams interview	CSA of the additional order process	10.1.2022	15 min	Recording and field notes
2	Project Manager	Teams interview	CSA of the additional order process	11.1.2022	30 min	Recording and field notes
3	Project Manager	Teams interview	CSA of the additional order process	11.1.2022	39 min	Recording and field notes
4	Project Manager	Teams interview	CSA of the additional order process	12.1.2022	18 min	Recording and field notes
5	Project Manager	Teams interview	CSA of the additional order process	12.1.2022	1 h 2 min	Recording and field notes
6	Project Manager	Teams interview	CSA of the additional order process	12.1.2022	18 min	Recording and field notes
7	Project Manager	Teams interview	CSA of the additional order process	13.1.2022	49 min	Recording and field notes
8	Project Manager	Teams interview	CSA of the additional order process	13.1.2022	26 min	Recording and field notes
9	Project Manager	Teams interview	CSA of the additional order process	13.1.2022	29 min	Recording and field notes

As seen in Table 2, the first round of data collection consisted only of interviews of the marine project management team. It appeared that there was not any company internal documentation available regarding the additional order process. All interviews were carried out via Teams, due to a challenging Covid-19 situation. Table 3 presents the second stage of the data collection.

Table 3. Data 2 collection

<b>DATA 2 - IMPROVING ADDITIONAL ORDER PROCESS</b>						
#	Source	Data Type	Topic	Date	Lenght	Documents
2	Project Manager	Workshop 1 / Teams	Creation of initial proposal	29.3.2022	1 h 56 min	Recording and field notes
6	Project Manager	Workshop 1 / Teams	Creation of initial proposal	29.3.2022	1 h 56 min	Recording and field notes
8	Project Manager	Workshop 1 / Teams	Creation of initial proposal	29.3.2022	1 h 56 min	Recording and field notes
5	Project Manager	Workshop 1 / Teams	Creation of initial proposal	29.3.2022	1 h 56 min	Recording and field notes
1	Senior Manager, Projects	Workshop 1 / Teams	Creation of initial proposal	29.3.2022	1 h 56 min	Recording and field notes
2	Project Manager	Workshop 2 / Face-to-face	Creation of initial proposal	8.4.2022	1 h	Recording and field notes
2	Project Manager	Workshop 2 / Face-to-face	Creation of initial proposal	8.4.2022	1 h	Recording and field notes
8	Project Manager	Workshop 2 / Face-to-face	Creation of initial proposal	8.4.2022	1 h	Recording and field notes
7	Project Manager	Workshop 2 / Face-to-face	Creation of initial proposal	8.4.2022	1 h	Recording and field notes
1	Senior Manager, Projects	Workshop 2 / Face-to-face	Creation of initial proposal	8.4.2022	1 h	Recording and field notes

Table 3 shows that the second round of data collection consisted of two workshops. The first workshop was arranged remotely due to illness of the thesis author, but the second workshop was a face-to-face meeting. Table 4 presents the third and final stage of data collection.

Table 4. Data 3 collection

<b>DATA 3 - VALIDATION OF INITIAL PROPOSAL</b>						
#	Source	Data Type	Topic	Date	Lenght	Documents
1	Senior Manager, Projects	Meeting 1	Validation of initial proposal	22.4.2022	1 h	Recording and field notes
10	Director, Marine Business	Meeting 1	Validation of initial proposal	22.4.2022	1 h	Recording and field notes

As seen in Table 4, one meeting was arranged to validate the initial proposal. The meeting was arranged face-to-face to go through the suggested solutions to improve the additional order process.

The next section describes the current state analysis of the additional order process, which is based on Data 1 interviews.

### **3 Analysis of Current Additional Order Process**

This section describes how the current state analysis of the current additional order process was conducted and what the outcomes from the analysis were. The section starts with the overview of this data stage and then it describes and illustrates the current additional order process. All findings from the data collection are divided into own subsections of strengths and weaknesses, which are summarised at the end of this section. The Data plan for the current state analysis was introduced in the previous section.

#### **3.1 Overview of This Data Stage**

As the objective of this study was to improve the current additional order process in the marine projects, a thorough analysis of it was needed. The plan was to collect data for the process description and visualisation. In order to improve the process, strengths and weaknesses were included into the analysis as well. From the weaknesses, it was decided which parts of the additional order process to improve.

The data collection was started by checking if there is any company internal documentation available regarding the additional order process. After investigating and verifying the results internally, it appeared that there was not any documentation available regarding the additional order process. The only available documents were quotations and price calculations done by the project managers and those documents were not needed at this data stage. The additional order process description and illustration needed to be done without any existing documentation.

Due to the lack of additional order documentation, all data for the current state analysis was collected from the interviews. The interviewees were selected strictly from the marine project management team excluding upgrade project managers. The main idea for the additional order process improvement was to do it from the new build project manager's point of view as they are the ones who



are working with the whole process. The improved process should have a positive impact firstly on the new build project managers. All eight new build project managers were interviewed excluding the author. In addition, their supervisor Senior Manager, Projects was interviewed as well.

The interviews were conducted within one week and due to Covid-19, all interviews were carried out using Teams. The lengths of the interviews varied from 20 minutes to one hour. The same question set was used for all interviewees with a total of five questions and after the formal questions there was time reserved for free comments regarding the thesis subject. The question subjects were directly related to the additional order process but were kept on a general level. The questions can be found from Appendix 1. All interviews were recorded, and field notes were taken according to the recordings from each interview.

After the interviews and field notes were completed, the process description and visualisation were done according to the interview findings. Then the strengths and weaknesses were sorted out into their own lists. Finally, a few of the major weaknesses were selected to be improved in this thesis.

### 3.2 Description and Illustration of Current Additional Order Process

Before starting the CSA of the additional order process, it was well known that there are problems within the process, but the number of problems was not clear. Another fact was that the process description was non-existent, therefore it had to be created from the interview information. A visualization of the additional order process can be seen in Figure 2.

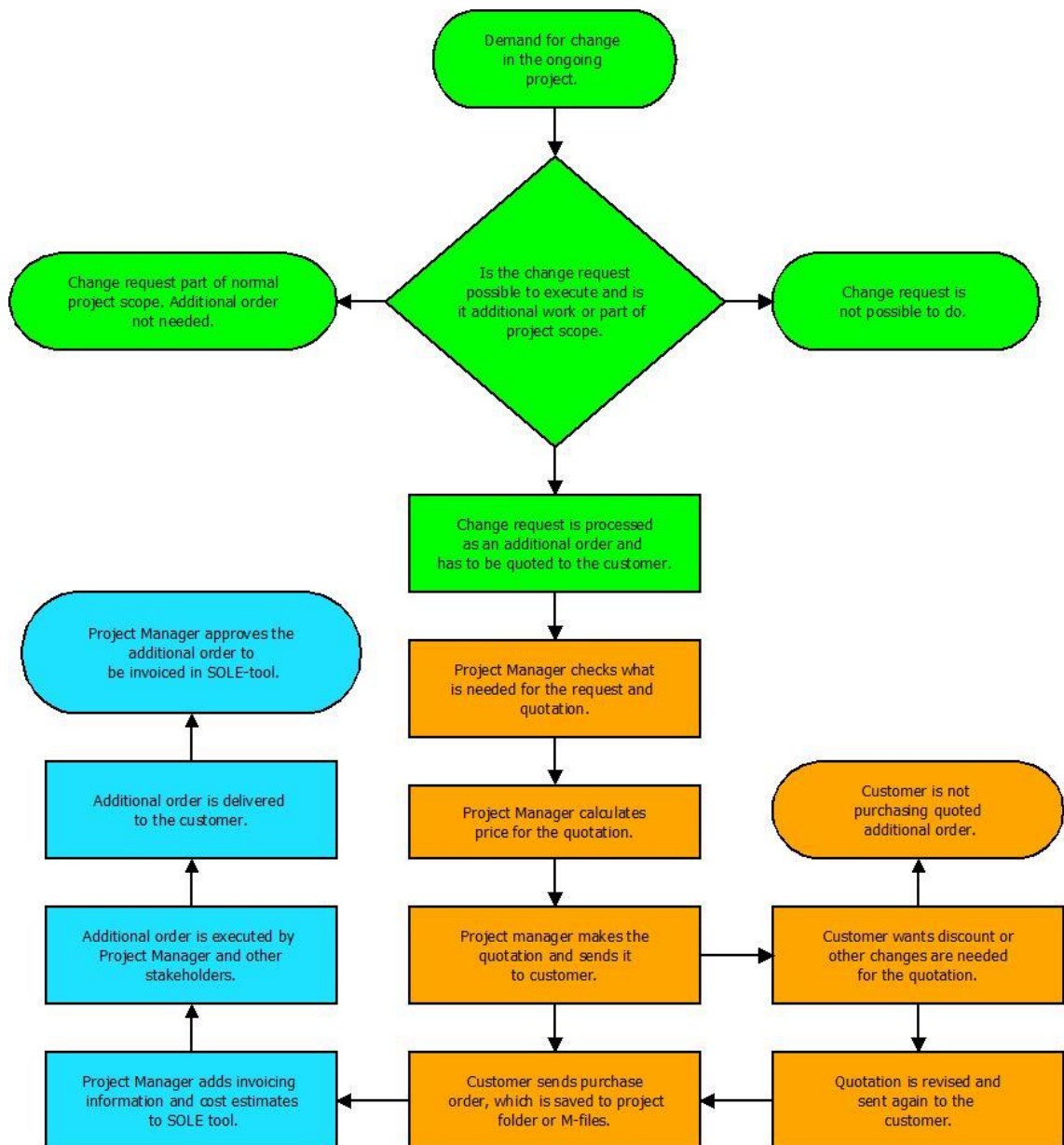


Figure 2. Additional order process visualization

In Figure 2, the additional order process is divided into three different phases, which are presented with different colours. Each phase has different steps to be taken in order to proceed to the next step and phase. The green colour indicates the definition phase, orange is the quoting phase and blue is the additional order execution phase. Details and descriptions of the phases can be found in the following subsections.

### 3.2.1 Additional Order Definition Phase

The additional order process starts with the demand or request for a change in the ongoing project. Usually, the request comes from the customer, but it is possible that the need for a change is noticed internally. In the new build projects, the customer is in most cases the shipyard that is building the vessel. Final customers or vessel owners rarely contact the case company directly, usually they communicate through the shipyard. The customer's point of contact for a change request is the case company's project manager for the project in question. The process visualization of the definition phase can be seen in Figure 3 below.

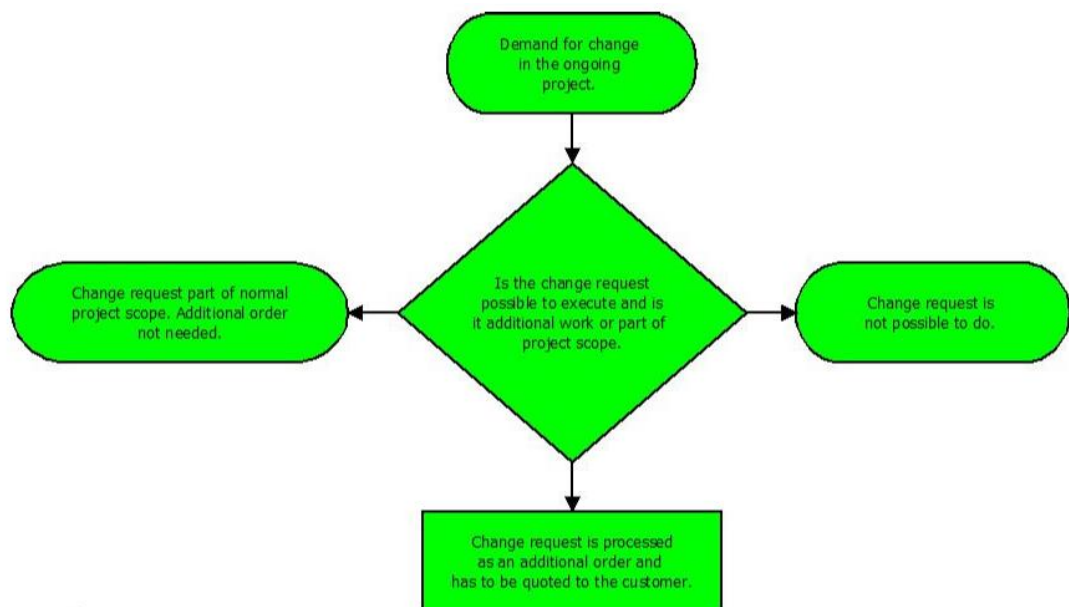


Figure 3. Definition phase of the additional order process

After the change request is received, the project manager needs to define whether the request will be processed as an additional order, is it included in the normal project scope or is the request even possible to fulfil. These options are displayed in Figure 3 as the outcomes from the decision symbol. Change requests can vary from very small system design updates to large scale upgrades including installation or they can involve new product design. One of the most common change request types is when shipyard changes the layout of the vessel

during the project, and it affects the case company's system design as well. These are explained more in detail in subsection 3.2.2.

The views expressed by the interviewees regarding the definition phase indicate that in most cases it is clear how to process the change request. Of course, there are cases where it is not clear how to proceed, but that was not seen as a big problem. One interviewee highlighted that sometimes the project managers need to explain and justify the need for additional orders to the customers. This was not always the case as the customers and especially the long-term customers know when the change request needs to be quoted as an additional order by the project manager. In the end, the decision whether the change request is an additional order or part of project scope, is up to the project managers. Making the decision gets easier with experience and the customer knowledge, which increases when the project managers work with the same customer in several projects.

The third option with the change request is not to execute it at all and there are a few common elements which affect this decision. The delivery schedule for the request can be unrealistic and therefore it is decided not to execute it at all. The customer's request may also be impossible to fulfil and cannot be delivered at all. One of the most common reasons for refusal is that the project manager already knows that the required change will be too expensive to execute that the customer is not willing to pay the costs. This is often the case if the customer requires something that needs special mechanical design, which is a slow and expensive process. One of the interviewees described the situation when special design is needed as follows:

“If the customer requires something that is a little bit deviating from the standard, things escalate quite far” (Data 1: interviewee 6)

The above quote perfectly describes the situation when special design is required. The situation needs to be highlighted to the customer to see if they are willing to wait and pay the upcoming costs. At this stage the upcoming costs of the design work and product are not clear which makes the quoting very difficult.

It was revealed in the interviews that in some additional order cases, the marine sales department is consulted regarding the customer change request. Normally the area sales manager who has sold the project in question, is the one to be consulted. Sales is usually brought on when the customer request is very demanding and the costs are very high. At this stage it is decided whether the quoting will be done by the project manager or area sales manager if the change request is to be quoted at all. This varies case by case and the project managers have different approaches to this matter.

Once the project manager has made the decision of how to proceed with the change request, it is possible to move to the next phase. If the change request is part of the project scope, the change is made without the additional order process. If the change request is not possible or feasible to fulfil, this needs to be communicated to the customer. The last possibility is to proceed with the quoting of the additional order, which is the next phase in the process and the main subject of this thesis.

### 3.2.2 Additional Order Quoting Phase

Once the project manager has decided to proceed with the additional order, the quoting phase can be started. The quoting phase has four main steps and the possible quotation revision step, which does not occur every time. The quoting phase process visualization can be seen in Figure 4 below. The different steps include checking what is needed for the quotation, calculating the price, making the quotation, possible revising of the quotation and receiving the purchase order from the customer.

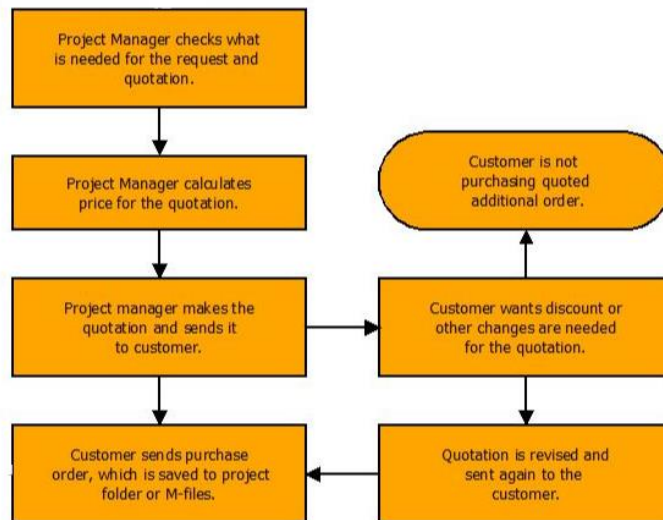


Figure 4. Quoting phase of the additional order process

As seen in Figure 4, the first step in the quoting phase is checking and defining what is needed for the additional order. This step can be roughly divided into two different types of additional orders and what is needed to fulfil them. The most common additional order requires standard materials and standard design work. Another type of additional order requires something that is not within the standard selection of materials and it requires special design work, which is usually mechanical design. In other words, something that does not exist needs to be created.

Fulfilling the standard additional orders usually consist of standard materials, layout design, electrical design, commissioning work, installation work and project documentation updates such as system manual. The additional order scopes vary between the delivery of a single item to big system updates including all the above-mentioned different work types and material deliveries. If a standard additional order requires design, installation or commissioning work and it is not only material, the project manager needs to check from the relevant stakeholders what is needed for the quotation. The most common stakeholders are project engineer and electrical engineer, but occasionally other departments or relevant authorities may need to be consulted. The project's delivery phase needs to be considered for example if all materials including electrical cabinets are already

delivered. In this case, electrical modifications need to be done during commissioning and this may affect commissioning schedules and materials. There are no guidelines or instructions available what needs to be taken in to account when defining work and materials for additional orders. This can be very challenging especially for new project managers without the needed experience.

The more challenging option for additional orders is when something special and non-standard is required. Depending on the request, this usually means that something new needs to be designed or standard system parts need to be modified. If the customer has indicated in the definition phase that they are willing to pay and wait for this type of additional order to be completed, the project manager needs to arrange it. One of the interviewees explained the special additional order situation in the following way:

“Customer has a demand, but there is not a solution available at the moment with the current goods. Then of course, the project manager needs to work a lot around the company, so that the right solution can be figured out before it is even possible to quote anything” (Data 1: Interviewee 6)

The above quote is a good example of how the interviewees generally felt about arranging the special additional orders. The different scenarios regarding the special additional orders are excluded from this thesis, because they go past the main topic.

Once the project manager has estimated what is needed for the quotation, it is possible to start calculating the price for the quotation. There is not any pricing tool available for the project managers, therefore each project manager has their own price calculation excels. Also, official guidelines for preferred gross margins are non-existent and pricing is mainly determined according to the previous gross margin percentages for each customer. Some bigger customers have pre-defined material and installation price lists.

According to the interviewees, the gross margin for materials is most often calculated on top of the transfer price. Transfer price is the cost which is added to the project from the materials ordered from the case company's production

facility. The transfer price already includes purchasing and production gross margins. There is not any transfer price list available for the project managers, therefore the prices need to be checked individually for each item from iScala. Design, installation and commissioning manhour costs are also added to the project costs. The gross margin for design hours is calculated on top of the internal hour cost, but installation and commissioning have different ways for pricing. Installation prices are often defined in the contracts. Commissioning prices are sometimes defined in the contracts and in case they are missing, the project manager uses after sales price or own price.

It appeared in the interviews that gross margin percentages vary radically between the customers and the project managers. Materials can be divided roughly into the case company manufactured materials and externally sourced materials. According to the interviewees, gross margins between 50% - 80% were used with the case company manufactured materials and gross margins between 17% - 50% with the externally sourced materials. These percentages do not apply always due to differences between the customers and order amounts, but it can be stated that the variation is too big. Design hours form a smaller part of the revenue in the additional orders; therefore, the interviewees did not highlight the used gross margins with them.

After the additional order price is calculated, the project manager makes the quotation. Quotations are made in word-templates and each project manager has their own type of template. A common quotation word-template is non-existent and this was mentioned by almost all interviewees. Also, there are no guidelines available regarding what to include and what not to include in the quotations. Normally quotations have a short description of what is included in the price and sometimes it is stated what is not included. In addition to the description there is a material list with some details of the items. The level of detail varies between the project managers and projects. Each project manager has their own way of naming the quotations and there is not any common way for the naming.



The quotations are not saved to any system where other employees could check what is quoted before the customer places the purchase order. This was seen as a positive and negative thing among the interviewees. The positive side is that if the customer is not purchasing the additional order, the project managers do not have to update it to any system. The negative aspect is the zero visibility towards other employees regarding the quoted additional orders.

When the project manager has finished the quotation, it will be sent to the customer in PDF-format. If the customer is satisfied with the price and quoted items, they will normally place a purchase order. Sometimes they may confirm only by email first if issuing of the official purchase order takes a long time and the quoted goods are needed quickly. If the customer is not satisfied with the price or the quoted items, they will send feedback to the project manager. Usually, the project manager may give some discount or revise the quotation regarding the items that the customer is satisfied. In most cases customers purchase the additional order after revising, but in some cases, customers end up rejecting the quotation and the additional order will be cancelled.

If a purchase order is received for the additional order, it will be saved to the M-files or to the project folder located in the network drive. Sometimes the project manager sends the additional order materials to the customer before receiving the purchase order. This happens quite often with long-time customers. After the purchase order is received, the project manager can proceed to the additional order execution phase.

### 3.2.3 Additional Order Execution Phase

The last phase of the additional order process is the execution phase. As seen in figure 5, the execution phase consists of 4 different steps. The steps include adding needed information to SOLE, actual execution, delivery to the customer and invoicing at the end. The execution phase can be simple for the project manager with standard orders, but special orders may require a great deal of attention during the execution.

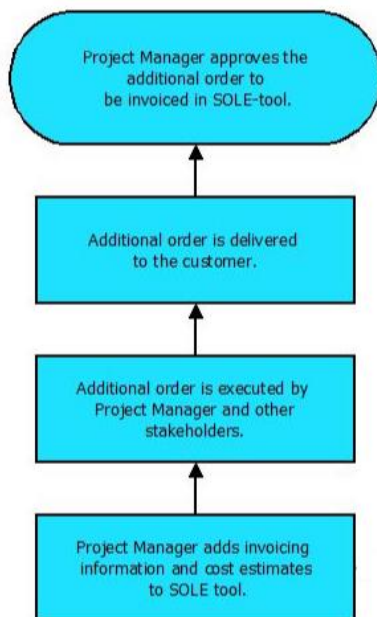


Figure 5. Execution phase of the additional order process

As seen in figure 5, the execution phase starts by adding the needed information to the SOLE. Normally, the customer purchase order has a desired delivery time for the additional order, therefore an invoicing milestone is added to SOLE according to that information. The invoicing date is usually set after the requested delivery time. Once the additional order is delivered, SOLE will remind the project manager regarding the invoicing. The invoicing date may have to be changed if the additional order delivery is postponed, because invoicing cannot be done before the delivery.

If the additional order is not very small or delivered immediately, cost estimates will be added to SOLE at this stage. In most cases, costs are calculated during the pricing, therefore adding them to SOLE is not an issue. If the costs are not calculated and customer specified list prices have been used, the costs must be calculated at this stage. The estimated costs may have to be adjusted before the delivery if there are delays or miscalculations with the costs. A customer purchase order number or other information is usually added to the costs in SOLE for future tracking purposes.

After all needed information is added to SOLE, the actual additional order execution can be started. It depends on the additional order what needs to be done, but the most common task for the project managers is to order the quoted materials from iScala. The needed materials have already been defined during the pricing and delivery information can usually be found from the customer's purchase order. Material and customer delivery information is inserted to iScala from where the case company's production gets the order information. After iScala order, production sends order confirmation to the project manager, who sends it to the customer. If there are delays in the delivery, production sends a revised order confirmation to the project manager, who forwards it again to the customer.

From the project manager's point of view, the rest of the additional order execution tasks are mainly performed by other personnel internally and externally. The project manager's role is to coordinate that all stakeholders have relevant information for the work. If needed, the project manager will attend internal and external meetings with the stakeholders to ensure that everyone has the needed information and the order execution goes as planned. Special additional orders require more attention from the project manager during the execution than the standard orders.

Once the additional order is completed, the additional order will be delivered to the customer. The deliverables usually include materials, but sometimes the deliverables can include only updated documentation. The project manager's responsibility is to keep the customer up to date with the delivery schedules and inform production if the delivery should be prioritized. Speeding up the production can be difficult for the project managers due to the fact that there is not much to be done with the delivery schedules. One of the interviewees stated that the project managers cannot influence the delivery schedules and one part of the problem is that some customers order on the very last second.

The last step with the additional order process is the invoicing. SOLE will give a reminder to the project manager regarding the additional order invoicing in the

pre-set date, which was entered to SOLE during the purchase order receipt. Once SOLE has given the invoicing reminder, the project manager can approve the invoicing milestone in SOLE that the additional order can be invoiced from the customer. Before invoicing the milestone approval, the project manager needs to check that the additional order is delivered and not postponed. The project manager does not send the invoice to the customer as it is sent by the shipping coordinator. Normally, there is not any issues with the invoicing if the customer has received what they have ordered. If the additional order invoice has not been paid, the project manager receives a reminder of the overdue invoice and the customer needs to be reminded of the payment.

### 3.2.4 Summary of the Additional Order Process Description

As can be seen from the additional order process description, most of the work for the project managers is during the quoting phase. The Definition phase is quick and straightforward with the standard additional orders while the special additional orders can be more time consuming. The execution phase has some actual work for the project managers especially with the material orders, but other tasks are executed by different personnel. Again, this does not apply to the special additional orders. The strengths and the weaknesses sections concentrate mainly on the quoting phase than the other two phases due to the fact that most work for the project managers takes place during the quoting phase.

## 3.3 Strengths of Current Additional Order Process

Besides the additional order process description, the interviewees were asked about the strengths of the additional order process. The strengths can be seen in Table 5, where the numbering does not mean the priority of the strength.

Table 5. Strengths of the current additional order process

<b>Strengths of the current additional order process</b>	
<b>#</b>	<b>Strength</b>
1	Takes the customer details into account. For example, history and solvency.
2	Increase the project profitability.
3	The project managers have full freedom to do the additional orders.
4	Pricing can be done case by case if the customer does not have specific pricing.
5	Gives empowerment and feeling of importance to the project managers.
6	Without guidelines, the project managers sales strengths are highlighted.
7	Good variation between other project management tasks.

As shown in Table 5, seven main strengths were identified from the interview data. The strengths are not concerning any actual tool used to work with the additional orders and they are more related to the way of working. Also, some mental strengths were mentioned by the interviewees. Strengths 1-4 are related to ways of working and strengths 5-7 are mental related.

Strengths one and four fall into the same category. The pricing history is important to know and the customer's solvency is good to be highlighted especially in the special additional orders. For example, offshore and navy customers are sometimes willing to pay for very expensive fully customised solutions, which could not be offered to standard projects. Therefore, by the customer knowledge, the pricing and what to offer can be tailored case by case. One of the interviewees stated as follows:

" Additional order is not quite the same as aftersales that it would be so mechanic. In aftersales, the customer has already committed to our system." (Data 1: Interviewee 7)

The above quote describes perfectly why the same guidelines cannot be used with all customers. Unsatisfied customers may select a different system to be used in the next project, therefore the customer details need to be considered when quoting the additional orders.

Strength number two was mutually seen positive among all interviewees. Due to increasing competition in the new build sales, the additional orders bring significant input to the project profitability.

Number three was seen as a double-edged sword by the interviewees, and it can be considered a strength and a weakness. Most interviewees liked the total freedom with the additional order pricing and quoting, but on the other hand, the absence of guidelines was seen as a disadvantage. A general opinion among the interviewees seemed to be that some guidelines should exist, but the project manager should still have the freedom regarding pricing and quoting.

Strengths 5-7 bring meaningfulness to the project manager's scope of work. Most of the project managers saw the additional orders as a positive part of the work. A general opinion regarding the question, are the project managers the correct persons to do the additional order quoting, was yes. Only one interviewee stated that the additional orders could be quoted by the sales department, while most of the interviewees were happy that sales can be consulted if needed.

### 3.4 Weaknesses of Current Additional Order Process

Besides the additional order process description and the process strengths, the interviewees were asked about the weaknesses of the additional order process. The weaknesses can be seen in Table 6, where the numbering does not mean the priority of the strength. The weaknesses in the list were selected from the quoting phase except weakness one, which concerns the whole process. There were many other weaknesses in the quoting phase and other phases, but the weaknesses in Table 6 were selected since those are the easiest to improve within this thesis. Many other weaknesses discovered from the interviews were involving other processes and departments within the case company.

Table 6. Weaknesses of the current additional order process

<b>Weaknesses of the current additional order process</b>	
<b>#</b>	<b>Weakness</b>
1	Non-existent process description.
2	No common quotation template, each project manager has their own template.
3	No guidelines for pricing in case the customer does not have existing pricelist.
4	No guidelines for defining what is needed for the additional order and what are the impacts on the project.
5	Price calculation is manual work, no common tool for pricing.
6	The customer specific price lists are not updated frequently.

As seen in Table 6, only six weaknesses were selected and they are all involved in the quoting phase except for weakness one, which is for the whole process. Weakness three was mentioned by all interviewees in some form and weakness two was mentioned by almost all. Weaknesses 3-6 were mentioned by at least 50% of the interviewees.

Weakness one was highlighted by only a couple of the interviewees, but a non-existent process description is one of the biggest problems in the additional orders process. It is vital to have a process description before any process improvements can be made.

Weakness two was already commonly known, and the interviews only highlighted this problem. The absence of a common quotation template was not the biggest weakness, but a general opinion among the interviewees was that the project managers should use the same quotation template. Now all the project managers are using different quotation templates.

Weakness three was seen as the biggest weakness within the quotation phase. If the customer does not have a pre-defined price list, there is not any official guideline for pricing or any price list. There are some unofficial rules for profit margins, but nothing official exists. Pricing is mainly based on the customer history and the profit margin variation between the customers and the project managers is significant. The situation is also challenging during the summer

holiday back-ups and for the new the project managers. Two interviewees described the situation as follows:

“In the eyes of the customer, [pricing] quality is varying. It is depending on the position of the moon what price is coming today.”  
(Data 1: Interviewee 8)

“You don’t have any price list, and then you just shake your hand and start to come up with a margin” (Data 1: Interviewee 9)

The above quotes are the worst-case scenarios, but sometimes the truth is not that far from those. Harmonizing the pricing would have a positive impact on the profits, because now for some customers the case company is selling for too low prices.

Weakness four was highlighted by many interviewees in different forms and contexts. Depending on the project manager’s experience, it can be very hard to determine what is needed to be taken into account when making the quotation. Most of the additional orders include only materials and a generic documentation update, but more complex cases have other factors as well. These can be commissioning, installation, special design or any other work that should be invoiced from the customer. Also, the project phase may change the quoting. If all electrical cabinets are delivered to the customer, the needed modifications need to be taken into account in commissioning. Now that PLCs are more common, it is not clear every time if reprogramming is needed. These and other factors may make quoting very challenging for the project managers.

Weakness five concerns directly the tools which are used for pricing. There is not any common pricing tool available, which would be suitable for the additional orders. Each project manager is using their own price calculation Excel. The case company has the Excel-tool which is used in the new build project sales available, but it is not suitable for the additional order sales due to its complexity.

Weakness six was mentioned by many interviewees as a big problem when it comes to the additional order profitability. The interviewees’ general opinion was



that the customer specific price lists are very positive, but they are not updated frequently enough by the sales department. In the worst-case scenario, prices are several years old, and the margins can be negative with some products due to internal price increases and inflation. The interviewees also mentioned variation in prices between the products in the price lists.

### 3.5 Summary of Current Additional Order Process Strengths & Weaknesses

The most important strengths and weaknesses were selected for the summary as seen in Table 7 below. Key strengths can be seen in green and key weaknesses in red.

Table 7. Summary of current additional order process strengths and weaknesses

<b>Summary of current the additional order process strengths and weaknesses</b>	
<b>#</b>	<b>Strengths or weakness</b>
1	Takes the customer details into account. For example, history and solvency.
2	Increase the project profitability.
3	The project managers have full freedom to do the additional orders.
4	Pricing can be done case by case if the customer does not have specific pricing.
5	Non-existent process description.
6	No common quotation template, each project manager has their own template.
7	No guidelines for pricing in case the customer does not have existing pricelist.
8	No guidelines for defining what is needed for the additional order and what are the impacts on the project.

As seen in Table 7, a total of four key strengths and a total of four key weaknesses were selected to the summary list. The strengths were selected based on the fact that projects generally benefit from the additional orders and in many cases, the freedom in quoting may benefit the customer and the case company. Strengths one, three and four can be seen as weaknesses as well, but they are also considered as strengths. Key weaknesses were selected because they are in the core of the additional order quoting phase and weakness five is a general problem within the whole additional order process. Key weaknesses 6-8 do not extend too

much to other processes or departments and are in the centre of the project manager's role in the additional order process.

The key weakness that was selected to be improved in this thesis is weakness five, which is non-existent process description. Weaknesses 6-8 go hand in hand and were too large and complex subject to be handled in detail in one thesis. Process description should be first in order before starting to improve single process steps. Weakness five was suitable for the improvement within the thesis and it benefits the whole process generally. Also, improvement ideas for other weaknesses can be implemented in a general level to the process description.

In the following Section 4, ideas for the improved additional order process are searched from the existing literature. The outcome is a conceptual framework for creating the improved additional order process.

## 4 Ideas on Improving Additional Order Process from Relevant Literature

This section describes the ideas gathered from the relevant literature to create the improved additional order process. Literature was studied regarding business process development and the outcome of this section is conceptual framework for the thesis. Section is divided to five different subsections. Subsection topics cover business process definition, business process modelling, business process management, business process improvement and finally conceptual framework.

### 4.1 Business Process Definition

According to Martinsuo and Blomqvist (2010), processes can be defined as chain of activities, which are utilizing resources to add value to the customer. In a basic process, there are four different elements which are chain of activities, resources, added value and the customer. Figure 6 illustrates a basic process model (Martinsuo and Blomqvist 2010: 5-6).

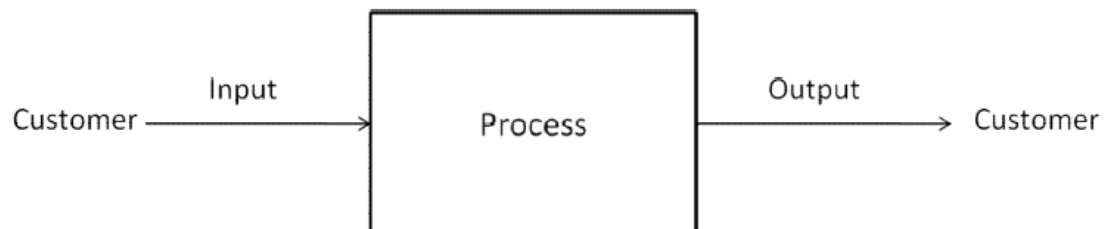


Figure 6. A basic process model (Martinsuo and Blomqvist 2010: 6)

As seen in Figure 6, process starts from the customer and ends to the customer, which makes it a customer-to-customer chain. The customer sets the requirements for the process and the customer can be internal, external or it is possible that the customer is not even known. Process is adding value to the input according to the customer's needs and expectations and the outcome is the output of the process. The output is the final product, service, solution or anything else that the customer has requested. To get the customer preferred output from the process, resources are needed to do that. Recourses can be raw materials,

labour, capacity, capital, tools or anything else that can be utilized to get the preferred output. The resources are limited and usually they cost money. Organizations can use internal resources or purchase the resources from outside suppliers (Martinsuo and Blomqvist 2010: 5-6).

Stated by Martinsuo and Blomqvist (2010), in business organizations processes can be divided in two different types, which are a process and a business process. The difference between the two is that a process does not have any definition regarding the process type, but business process makes economic profit. Processes can be core or support processes depending on the customer. Core processes have the external customers and support processes have the internal customers. Processes may have different levels which consist of main processes and sub-processes. Main processes are divided to sub-processes, which can be shown on different levels. The last major types of processes are current and target processes. Currently used processes are called current processes and processes as they should be or are intended to be are target processes. Process modification is needed when there are differences between the current and target process (Martinsuo and Blomqvist 2010: 6).

According to Martinsuo and Blomqvist (2010), process objectives and resources are usually connected to company's organizational structure, which makes the structure a matrix organization. Essential core processes may need resources from all the departments of the company and secondary processes may need resources only from some parts of the company. When an organization or a company has processes, they should be controlled and managed. The idea in process management is to measure and set targets for the processes, which are supporting company's objectives. This requires feedback from the process, which can be seen in Figure 7 (Martinsuo and Blomqvist 2010: 6-8).

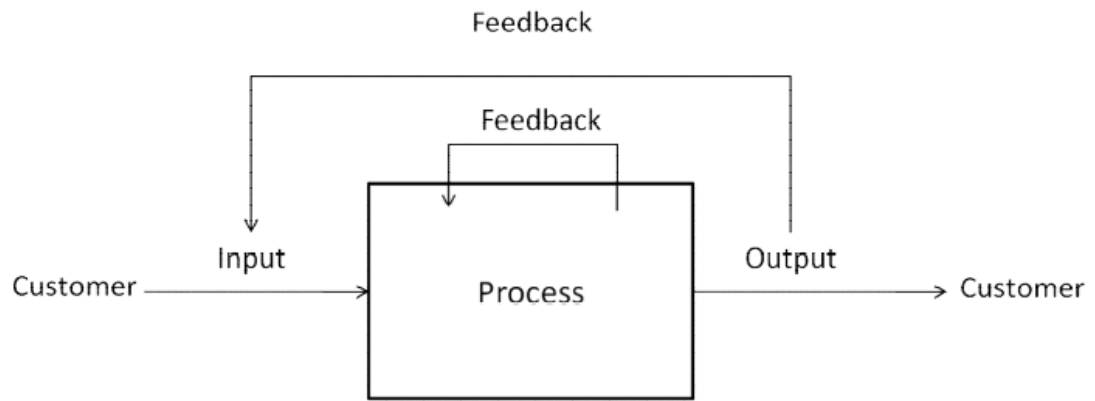


Figure 7. Feedback in a basic process model (Martinsuo and Blomqvist 2010: 8)

In Figure 7, two types of feedbacks can be seen. Feedback from the output refers where the output goal is fulfilled after input went through the process. Process internal feedback refers to the quality and proper functioning of the process. Feedbacks are for the process development and measuring (Martinsuo and Blomqvist 2010: 7).

With the above categorizations it is possible to define on a general level what kind of processes a company is having. It is important to know if the process is a business process and does it involve the external customers or not. In the process management, feedbacks are needed to develop and measure current processes. Without having the basic knowledge of what a process and related items are, it is impossible to make proper and grounded improvement to any process.

## 4.2 Process and Enterprise Maturity Model (PEMM)

Hammer (2007) has developed a model for companies to evaluate processes and process-based transformations. The model is called Process and Enterprise Maturity Model (PEMM). According to PEMM, companies need to verify that their processes are improving and maturing in order that the process performance would be higher. There are two different features that companies need to develop. Process enablers concern individual processes and enterprise

capabilities concern the entire company or enterprise (Hammer 2007: 2-3). PEMM-tool can be found from Appendix 2.

There are five different process enablers, which are design, performers, owner, infrastructure and metrics. Design is the specification for the project execution, performers are the employees working with the process, owner is preferably a Senior Manager with a responsibility of the process, infrastructure is the IT- and management systems supporting the process and metrics are the measures of process performance (Hammer 2007: 3). Enterprise capabilities were handled in this thesis as they concern the whole company. This thesis is only for a single process.

Hammer (2007) points out that the process design needs to be in a good order that the people working with the process know what to do and when to do. Without proper process design, it is not possible to execute it. To execute the process according to the design, process performers need to have sufficient knowledge of how to do it. Untrained employees cannot perform effectively. Every process needs an owner, who should preferably be a senior level manager with a complete responsibility over the process. Senior Manager is responsible that process delivers determined results. Company needs to have a proper infrastructure for the process execution. Without right IT and management tools for the process support, it is not possible to have a good process performance. Metrics are needed to develop and evaluate the process performance. If metrics are not in order, it is possible that the process is not giving the desired results (Hammer 2007: 3).

Hammer's PEMM model gives good tools for evaluating the process maturity and changes. It does not require special skills and can be executed by company's own employees, which is sometimes better option compared to external consultants. The tool can be used before and after company's process has been updated for the comparison between the before and after situations. From the process enablers it is easy to pick up five key points that processes need to have in order to have a good process performance.

### 4.3 Business Process Mapping

Kmetz (2012) provides a workflow mapping and analysis method called WFMA. WFMA is suitable for all kinds of process mapping and business model analysis. WFMA has two advantages compared to the majority of process mapping approaches. It does not require tacit knowledge or implicit knowledge and specific software is not required for process mapping or analysis. WFMA is designed to be a simple way to graphically display material and information flows to complete a system objective (Kmetz 2012: 45-52). Only workflow mapping of the WFMA method is used in this thesis and the analysis part has not been dealt with.

Kmetz (2012) underlines that process mapping symbols shouldn't be the main element of the process maps. WFMA uses basic well known flowchart symbols that can be used to describe any organizational process. Figure 8 shows the process mapping symbols used with the WFMA method (Kmetz 2012: 53-54).

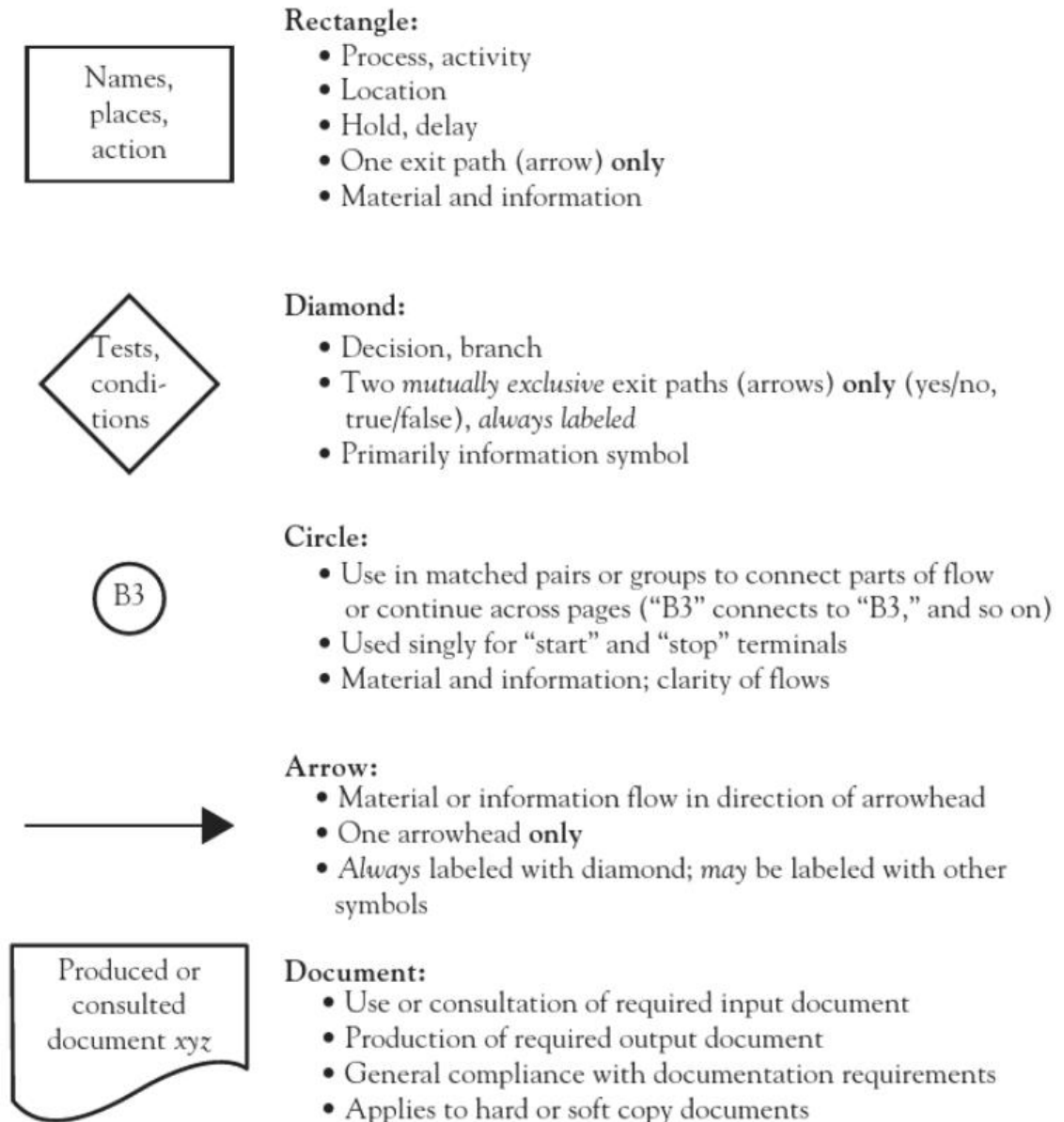


Figure 8. WFMA process mapping symbols (Kmetz 2012: 54)

As seen in Figure 8, WFMA process symbols are general, widely used symbols, which are easy to understand by anyone. These symbols suit well to describe the process of the thesis subject and they do not require any special software to do the process mapping.

Page (2012) states that process mapping is possible to do on high level or on a detailed level. The decision depends on the goals of the process map and is



eventually up to the drawer. Figure 9 shows some grounding for the process mapping detail level (Page 2012: 4b-4c).

Detailed Level	High Level
<p>Draw a detailed-level process map if the process:</p> <ul style="list-style-type: none"> <li>■ Is used often by many people.</li> <li>■ Experiences high turnover among process workers.</li> <li>■ Is a subprocess of another business process.</li> </ul>	<p>Draw a high-level process map if the process:</p> <ul style="list-style-type: none"> <li>■ Is undefined and little shared understanding exists in the organization of the end-to-end business process.</li> <li>■ Is a complex process.</li> <li>■ Is a highly variable process.</li> <li>■ Has many subprocesses.</li> </ul>

Figure 9. Different detail levels of process map (Page 2012: 4c)

As seen in Figure 9, there are different justifications for the detail level of a process map that needs to be considered when mapping a process. Biggest factors are the people who use the process map and process complexity. The level of detail can also be somewhere between the detailed and the high level.

#### 4.4 Business Process Management (BPM)

Zairi (1997) states that the business process management (BPM) is an organized way of constant improvement and analysis of company's basic functions such as manufacturing, communications, marketing and other activities. BPM is concentrating to the parts of business operations, which are having a great deal of added value and high leverage. For a successful BPM, main processes need to be well mapped and documented and process measures need to be in place for evaluating of each individual process. Also, constant process improvement needs to be in place (Zairi 1997: 64-65).

According to Brocke and Rosemann (2010), knowledge workers and their work have not been involved that much with processes or process analysis. Knowledge workers may see processes as a bureaucracy and they often feel that their

workdays are different every day, therefore processes cannot be applied. It is possible to apply processes for the knowledge workers but the approach needs to be designed according to the complexity of work and level of interdependence. As seen in figure 10, some categorization can be done on what type of work and workers there are when processes are designed (Brocke and Rosemann 2010: 19-20).

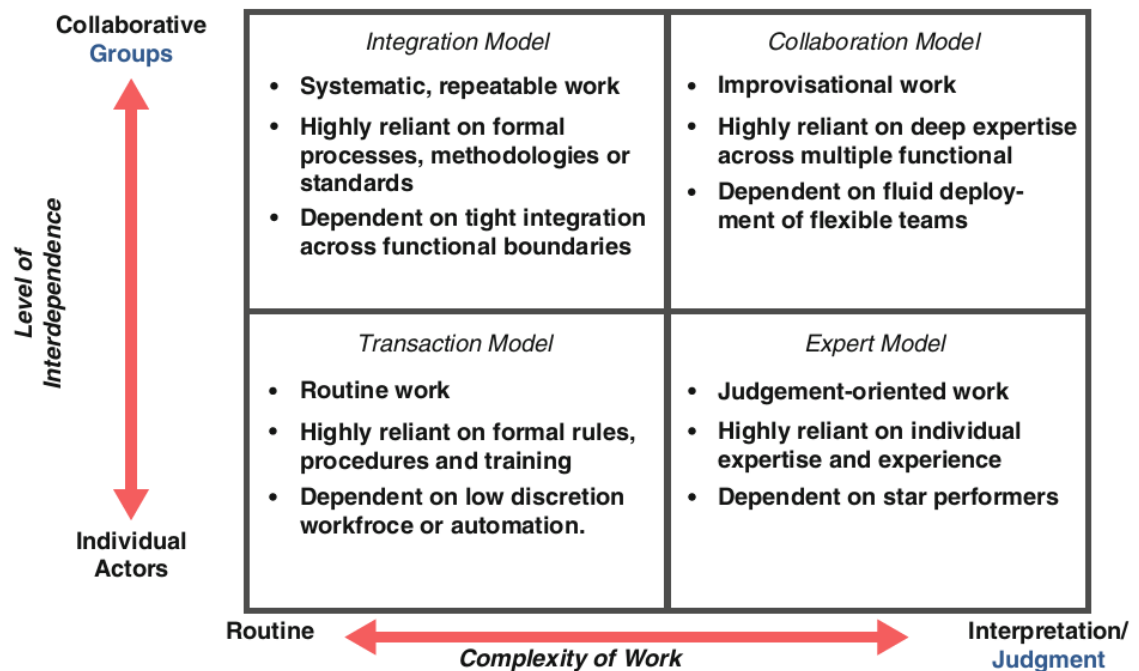


Figure 10. Four different models of knowledge work (Brocke and Rosemann 2010: 20)

In Figure 10, transaction model has the most routine, which makes it easier for the process approach. The collaboration model in the top right corner is the most difficult model for process management approach. The more complex and collaborative the work is, the more difficult is the process approach (Brocke and Rosemann 2010: 20).

Transactional workers do not use that much of instructions or other sources of information for their work. More important factor is to have the clear flow of the work and to have already the information to do the work. Processes can often be applied to the transactional workers computer applications, which measure the

process at the same time. So, for the transactional workers, processes are applicable. Integration workers have time and possibility to follow documentation and it is possible to apply process documentation. Expert type of work is challenging what comes to processes. Expert workers have autonomous work scopes and they are free to make many decisions regarding their work. The odds for expert workers to lean on detailed processes is highly unlikely and instead of processes, improvements should include guidelines, templates and sample outputs. Collaboration workers are the hardest to approach with any type of processes. Same challenges as with the expert workers apply to collaboration workers as well. Collaboration workers tend to use even less guidelines and templates than expert workers and needed information should be available from documents and repositories (Brocke and Rosemann 2010: 21).

Business process management cannot be applied directly to the additional order process. The current process is not mature and needs to be created before BPM could be applied in a higher level. The additional order process can be seen as a sub-process of project management process, which is also non-existent at the moment. As a work, marine new build project management falls to the expert category, therefore it cannot be fully transformed to the process work. Processes should be documented and used, but the main scope of work including the additional order process should rely more to guidelines, templates and general level processes.

#### 4.5 Business Process Improvement

Rohleder & Silver (1997) highlight the importance of business process improvement. They offer a simple framework for a process improvement, which is possible to apply in any organizations and for any process. Figure 11 shows the schematic of the framework (Rohleder and Silver 1997: 139-140).

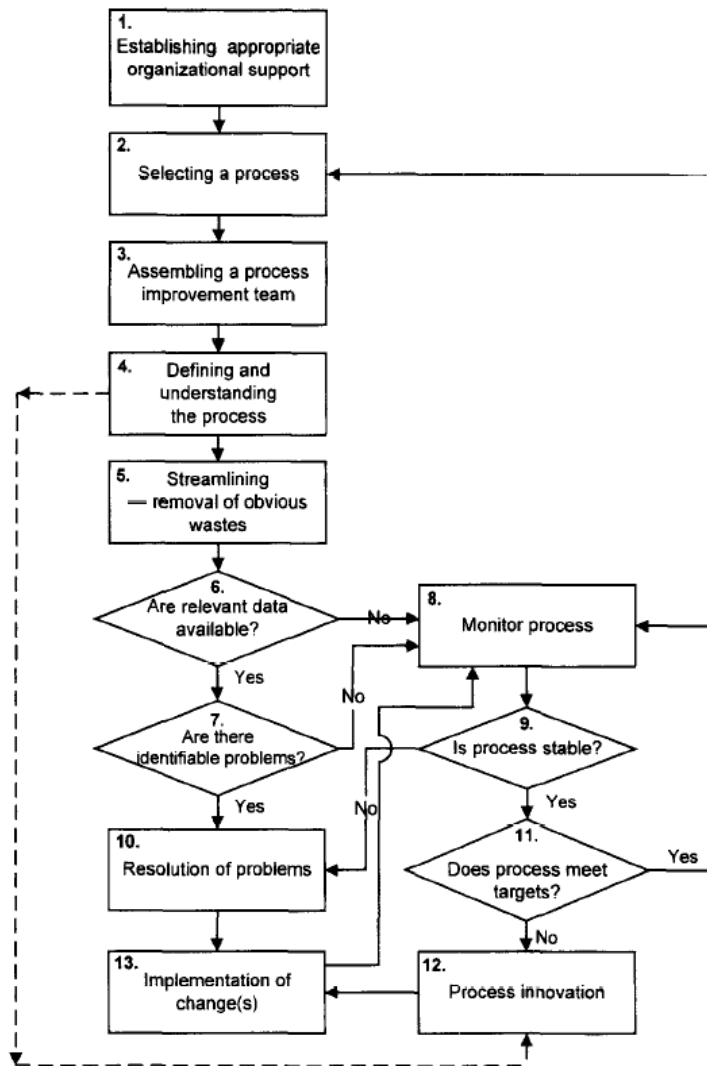


Figure 11. Schematic model for process improvement (Rohleder and Silver 1997: 141)

Rohleder and Silver (1997) claim that the framework in Figure 11 is to be used as a guideline. The sequence of the model is only for reference and sequence can be changed if needed. Innovation is an important part of the process improvement; therefore it is recommended that not all steps of the framework should be followed every time. It is possible to apply only some parts of the framework to get good results of the improvement process (Rohleder and Silver 1997: 140).

Framework starts with the step 1, which means getting preferably senior management's support to ensure needed resources for the process

improvement. The process to be improved is selected in step 2. In step 3, relevant team needs to be selected for the process improvement. The improvement team's first task is to define and understand the process and its performance thoroughly, which is the fourth step. Once the process is well defined and understood, streamlining needs to be conducted in step 5. This means the removal of waste, which does not add any customer value. In the sixth step, existing process performance data needs to be examined that the specific problems can be identified. If data exists, it is possible to move to step 7, where process problems can be identified. If there is not relevant process performance data available, it needs to be collected by monitoring the process in step 8. Steps 9, 11 and 12 are excluded from this thesis as they are not relevant to the thesis subject. So, after the process monitoring, it is only possible to move to step 7 for the problem identification. In step 10, solutions will be found out to the identified problems. The last step of the process is the implementation of solutions from step 10 (Rohleder and Silver 1997: 140-141).

With small adjustments, the business process improvement framework can be applied to the thesis subject. It is generic enough, but it includes all needed steps for improvement.

#### 4.6 Process Ownership

According to Hrabal and Tuček (2018), when organizations move towards the use of processes, process owners are needed. Process ownership is a managerial role and it is crucial to have in all process set organizations. Process owners should have certain set of skills to conduct process management. Besides the competencies, process owners need to manage and execute tasks related to managed processes. In Table 8, there are descriptions of the tasks and responsibilities that process owners should perform (Hrabal and Tuček 2018: 138-145). Process owner competencies are not dealt within this thesis due to the fact that it goes beyond the subject. Process owner's tasks are more relevant what comes to the thesis topic and the continuity of the additional order process development.

Table 8. Process owner's activities and responsibilities (Hrabal and Tuček 2018: 145)

Process owner's activities	Activity description
Cooperating on process strategy and governance	Together with top management defines BPM goals and strategy which then communicate in the organization. Identifies key processes and subprocesses. Together with his process team implements assigned process.
Setting and communicating process goals	Defines goals and key performance parameters of the process in connection to organizational strategy and customer requirements. After top management approval and with process team support he communicates goals to stakeholders.
Designing the process	Set inputs, outputs and procedures parameters incl. needed infrastructure. Identifies process interfaces, develops responsibility matrix and communicates the design within the organization. Process team cooperates on the design and creates process model which is then approved by the process owner.
Managing process performance and ensuring feedback	Leads process implementation together with the team and functional managers. Regularly monitors performance indicators and goals achievement, provides feedback to workers in the process. In case of problems he initiates resolution.
Managing and coordinating functional managers in the process	Convenes and leads (regular) meetings with functional managers in the process to solve issues connected to the process, its attributes and performance.
Rewarding process team	Is rewarded and rewards the team and workers according to process performance.
Sponsoring process improvement projects	Ensures the support for project managers and teams improving process performance.
Reporting to top management	Regularly reports to top management about process performance.
Ensuring and managing resources in the process (optional)	In case that process owner is executive manager, he or she sets, ensures and manages resources for the process incl. financial, material and human resources.

The tasks described in Table 8, are vital for the development and continuity of the processes. If there are any processes in the organization, there should be process owner for each process. Especially when it comes to the knowledge work, which was referred before, process owners are important to have if any processes are to be implemented or developed. Knowledge work is often possible to execute without any processes in place. If organizations want to implement processes for knowledge work, a dedicated person is needed for that. Otherwise, there is a major risk that the processes and guidelines will not be followed. Activities in Table 8, give a good overview of what process owners should do.

#### 4.7 Key Performance Indicators (KPIs)

According to Parmenter (2007), key performance indicators (KPIs) are often mixed up with key result indicators (KRIs). KRIs indicate how have you done in a perspective and indicators can be the customer satisfaction, net profit before tax, profitability of the customers, employee satisfaction and return on capital employed (ROCE). KRIs are formed as a result of different tasks and the main point is to show if company is going into right direction. KRIs main idea is to provide information to the executive level and not to the management level who

are working with the daily issues. KPIs are measures, which are crucial for the organizations' current and future performance. The list below has seven main features for KPI definition (Parmenter 2007: no pagination).

- measured with nonfinancial measures such as dollars or euros
- measured often
- reacted by senior management and CEO
- measure and corrective actions are understood by employees
- responsibility is bind to the teams and individuals
- significant impact on the core success
- positive impact on all performance measures.

Performance measures tend to align with financial information; therefore it is important to design the KPIs without financials. The list above can be used as a reference to the design of process KPIs. It is not mandatory to fulfil all definitions in the list with the KPIs, but it is important to design the KPIs that the process users, process improvement and the process outcome benefits from the KPIs. Irrelevant KPIs are not needed.

## 4.8 Conceptual Framework

This section illustrates the improvement ideas from the relevant literature for the additional order process. Improvement ideas were gathered according to the findings from the current state analysis and the ideas form the building blocks for the conceptual framework. The conceptual framework is shown in Figure 12.

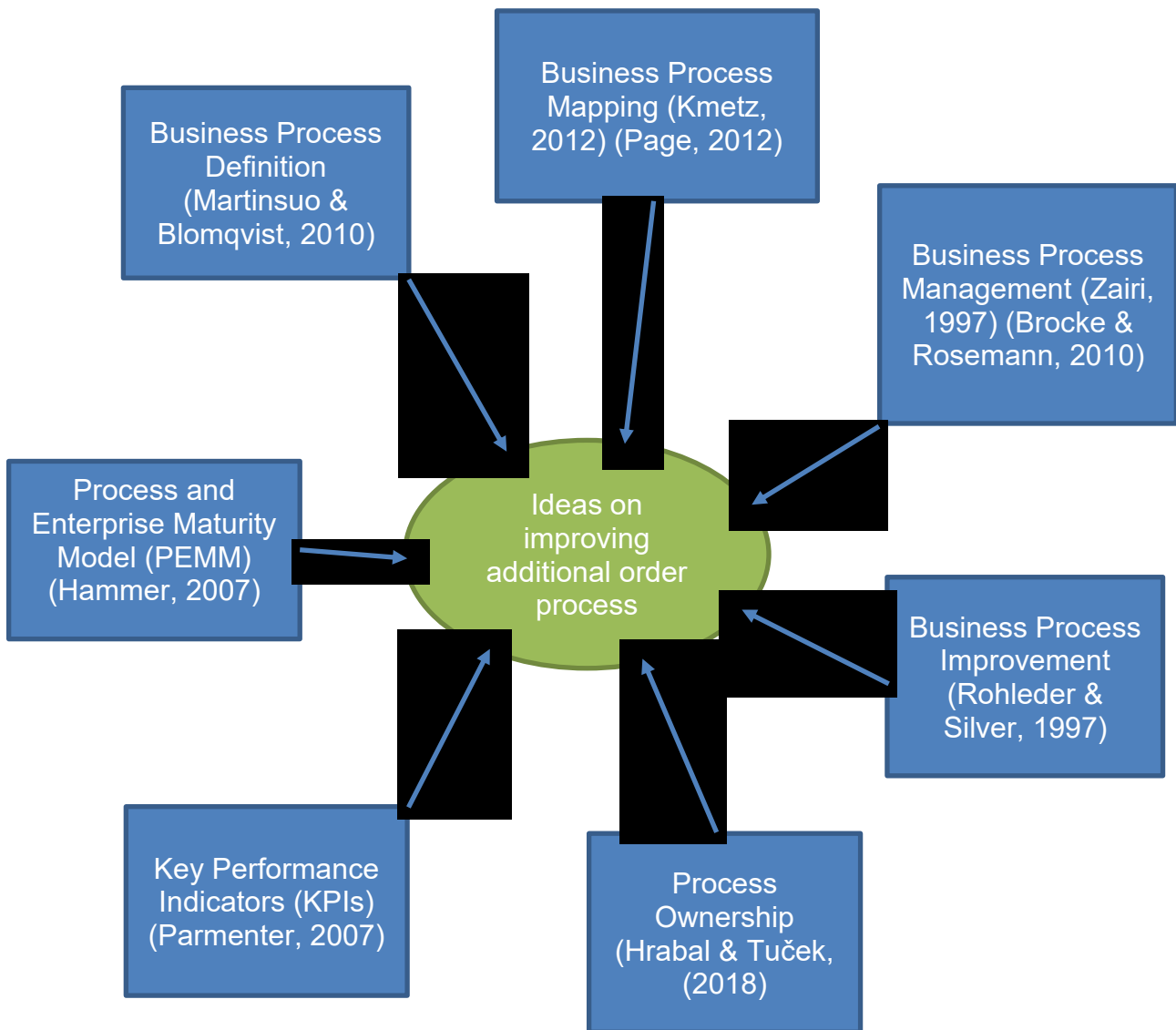


Figure 12. The conceptual framework of this study

As seen in Figure 12, the additional order process improvement ideas are divided in seven different topics. Main weakness of the additional order process was the non-existent process description; therefore, the improvement ideas are concerning business processes, process development, process mapping and a few ideas regarding the process management. The common process improvement tools such as six sigma, lean, kaizen, PDCA and so on were excluded from this framework, because currently the additional order work does not follow any process.



Business process definition includes the basic elements of the processes and business processes and it summarizes what business processes should include. The business process mapping provides basic elements for the illustrating of the processes and it helps to define the needed detail level of the process maps. The business process management explains business management and it provides a model for the process design according to the type of work and workers. The model in the business process improvement can be applied for any process improvement including the additional order process. Process ownership provides the tasks for process owners. KPIs define the metrics for the process measurement. PEMM highlights the importance of the process enablers and it provides a simple tool for process maturity measurement.

In Section 5, the conceptual framework will be used to create the initial proposal of the improved additional order process. The building blocks of the conceptual framework will help to build the process description including the improvement suggestions for each process step.

## 5 Improving Additional Order Process

Section 5 describes the initial proposal of the additional order process improvements. Findings from the current state analysis and the conceptual framework were implemented to the initial proposal creation. This section gives an overview of the improvement stage, illustration and description of initial proposal and finally a summary of the proposal.

### 5.1 Overview of Improving Stage

The objective of this thesis was to improve the current additional order process in marine & offshore newbuild projects. The current state analysis was conducted to map out the current additional order process, its strengths and its weaknesses. The CSA was conducted as interviews and the details can be found from Table 2, Data 1 collection. The outcome of the CSA was the first version of the additional order process description, the list of strengths and the list of weaknesses. The lack of additional order process description with general level improvement ideas was the weakness that was selected to be improved in this thesis.

After the CSA was conducted, the process description and the improvement ideas were searched from the relevant literature. The found references concerned business processes, process improvement, process mapping, process measuring, business process management, process ownership and key performance indicators. The outcome of the relevant references was the conceptual framework.

The building of the initial proposal was started with two workshops. The workshop participants were the same as in the CSA, but the attendee amount was limited to five persons per workshop. The attendees were the marine new build project managers and their supervisor Senior Manager, Projects. Workshop details can be found from Table 3, Data 2 collection.

The first phase of the workshop was to go through the additional order process map, which was created in the CSA. All steps of the process were discussed

thoroughly and the needed changes were decided in the workshop. Also, the detail level of the additional order process map was discussed. The second phase was to go through each process step and to suggest improvement ideas for them. The third phase was to define the additional order process owner and the owner's responsibilities and activities. The last phase of the workshop was to create the key performance indicators for the additional order process. Field notes were done from the workshop recordings.

Based on the CSA, the conceptual framework and workshops, updated process map with the descriptions was created with the improvement ideas to some of the process steps. Also, the process owner's role and KPIs were created based on the conceptual framework and workshops. The additional order process map was not changed radically from the CSA, but some important updates and simplifications were made. Improvement ideas were kept realistic and they can be used to solve weaknesses found from the CSA. The following chapters describe the updated process description, improvement ideas, process ownership and KPIs.

## 5.2 Building the Initial Proposal for the Improved Additional Order Process

The outcome of the initial proposal consists of four different parts. The first part is the verified additional order process, the second part is the improvement ideas, the third part concerns process ownership and the last part suggests possible KPIs for the process.

### 5.2.1 Illustration and Description of Verified Additional Order Process

The first part of the initial proposal was the verification of the current additional order process. The process created in the CSA was reviewed in the workshops and the verified additional order process map is shown in Figure 13.

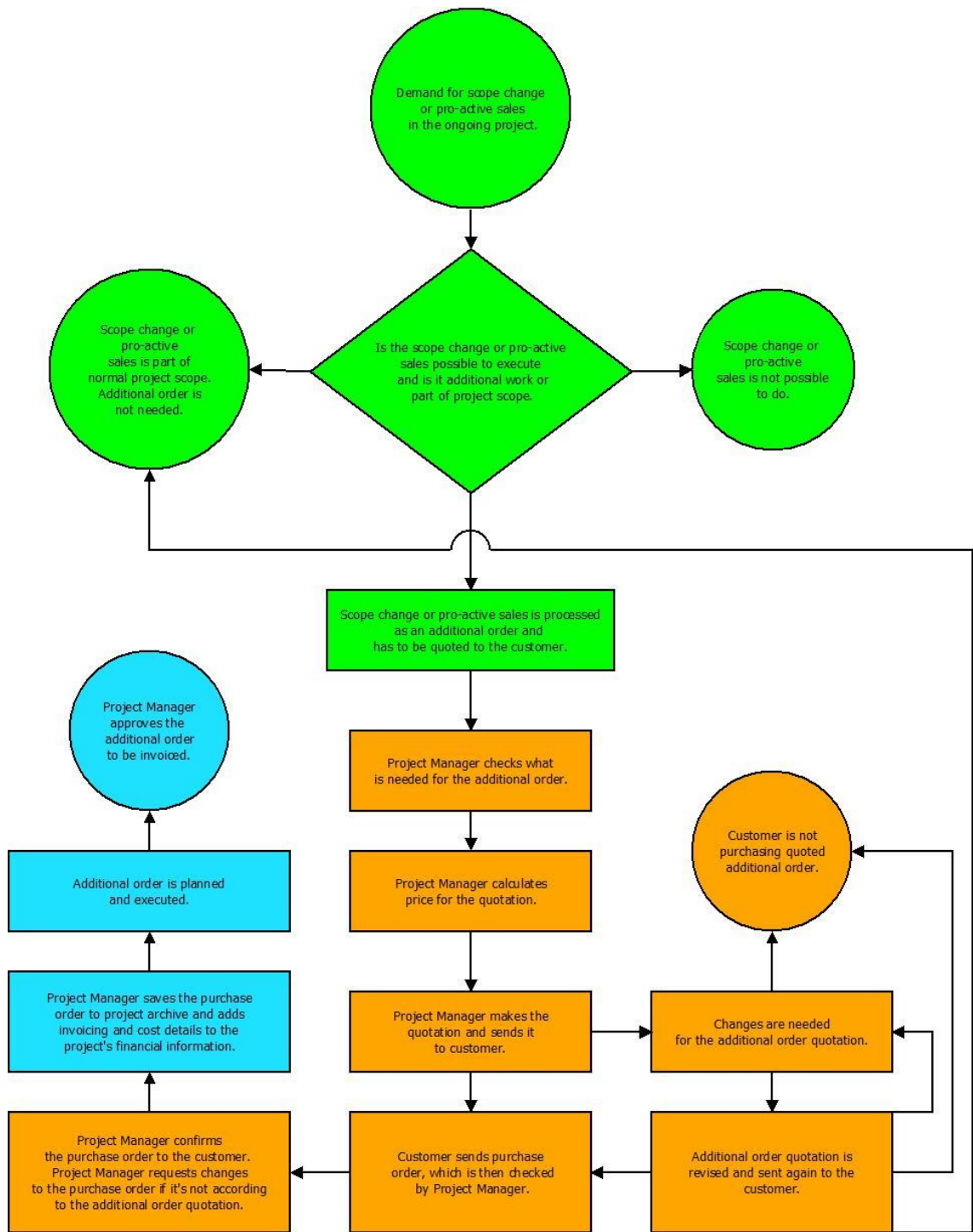


Figure 13. Verified Additional Order Process

As seen in Figure 13, the process map did not change radically from the first version created in the CSA. Some adjustments were made in the word choices and three flow arrows were added to the quotation revision step. The biggest changes were made to the quoting phase and execution phase. The applications

used by the case company were excluded of the process map, therefore it won't need to be updated if the applications change at some point. Most of the steps in the verified additional order process are explained in the CSA, therefore only the changed parts are explained below.

In the definition phase, the major change was to add pro-active sales in addition to the scope change. Pro-active sales is usually initiated by the project manager and not by the customer. It usually includes upgrades to the delivered system and it creates the additional order if the customer is interested about it. There were not any additional process steps added to the definition phase.

For the quoting phase, three process flow arrows were added to the quotation revision phase. After revising the quotation, it is possible that more revisions are needed, the customer will not purchase the quoted items after revising or the quoted items will be added to the normal project scope. One step was added for the purchase order confirmation to the customer. This varies between the customers and the purchase order confirmation may include everything from email confirmation to signing multiple pages of purchase order documentation. In the bigger additional orders, it is important that the project manager compares the quotation and the purchase order if there are any deviations. In case of deviations, the project manager needs to request a revised purchase order. This is an important step to do in case there will be any disputes in the future regarding the additional order.

The execution phase was simplified by removing the separate additional order delivery step. It was concluded in the workshops that the additional order delivery can be physical items or services and the execution is done by many different stakeholders in different departments. The delivery refers too much to the physical material deliveries. The project manager's role in the additional order execution is more coordinative and managing than actually executing the order. In addition, the project manager is responsible for ordering the needed materials from the ERP system, which is the main task besides coordinating and managing the execution.

The detail level and the amount of process steps were discussed in the workshops. The detail level was unanimously approved to be sufficient to keep the process map in a general level. More detailed descriptions would have been problematic due to the fact that there are too many variables and exceptions in many steps. It was suggested in the workshops that more process steps would be needed to describe the related processes as well. After discussions it was decided to keep the steps in the current amount to avoid too many references to other processes.

### 5.2.2 Improvement Suggestions for the Additional Order Process

After the additional order process steps were verified in the workshops, each step was discussed for improvements suggestions. The improvement suggestions were kept realistic that they would be possible to implement soon. Many different improvement ideas were discussed, but the implementation wouldn't be possible. Table 9 shows the improvement suggestions for certain process steps.

Table 9. Improvement suggestions for the additional order process

<b>IMPROVEMENT SUGGESTIONS FOR THE ADDITIONAL ORDER PROCESS</b>	
<b>Process Step</b>	<b>Improvement Suggestions</b>
Demand for scope change or pro-active sales in the ongoing project.	<ul style="list-style-type: none"> <li>• A List of items what can be sold pro-actively</li> <li>• Supporting documentation for pro-active sales</li> </ul>
The project manager checks what is needed for the additional order.	<ul style="list-style-type: none"> <li>• Instructions or checklist what needs to be considered when preparing quotation</li> </ul>
The project manager calculates price for the quotation.	<ul style="list-style-type: none"> <li>• Guidelines to use aftersales spare part price list for material price calculation</li> <li>• Guidelines for target margins</li> </ul>
The project manager makes the quotation and sends it to the customer.	<ul style="list-style-type: none"> <li>• An own tab to project finance tool for the quoted additional orders</li> <li>• A common quotation template</li> </ul>
The project manager saves the purchase order to project archive and adds invoicing and cost details to the project's financial information.	<ul style="list-style-type: none"> <li>• Functions to project finance tool for the additional order costs follow up</li> </ul>

As seen in Table 9, a total of five process steps have improvement suggestions. One step is from the definition phase, three from the quoting phase and one from the execution phase. The improvement suggestions concern mainly supportive documentation for the process steps and functions for SOLE. There were not reasonable suggestions for all process steps and a general opinion in the workshops was that it is not mandatory to improve everything. The improvement suggestions in Table 9 support the project manager's daily work, the possible profitability increase and the visibility of the quoted additional orders to the rest of the organization. The subsections below have explanations for the improvement suggestions.

The improvement suggestions for the first step of the additional order process concerns pro-active sales. Now it is not clear for the project managers what services and products can be sold pro-actively, therefore a list of items is needed. In addition to the list, supporting sales documentation is needed to highlight the importance of the proposed items to the customer. The list below contains items that were discussed in the workshops to be suitable for the pro-active sales.

- water treatment unit (WTU)
- machinery test valve assemblies
- junction boxes
- pre-action valves
- warranty extension
- crew training
- site supervision.

The WTU and the machinery test valves are often sold as upgrades after the new build project completion by the upgrade project team. From the customer's point of view, it would be reasonable to make the WTU and the test valve installations when the ship is built, therefore quoting them during the new build project would make sense. The junction boxes, pre-action valves, warranty extension and site supervision suit perfectly to be sold during the new build project as it is not possible to quote them after the ship is built. Crew training can be provided

anytime of the ship's lifecycle, but if the crew is not familiar with the case company's system, training would be beneficial just after the ship building is completed.

The second improvement suggestion is regarding the first step in the quoting phase. Now there are no guidelines available what needs to be considered when the project manager checks what is needed for the quotation. Instructions or checklist should be created, which includes at least items in the following list.

- information from who to ask and what
- explanations of what practically means from the quotation point of view to add a nozzle, valve etc. to the ongoing project
- impacts on the electrical designs and components such as cabinets, PLC programs etc.
- impacts on the installation if project is a turnkey
- impacts on the commissioning
- impacts on the classification.

The items above with detailed explanations would help the new the project managers to consider all aspects when making the quotations. If these things are not taken into account, it is possible that extra costs will appear in the additional order execution phase and they are not paid by the customer. The extra costs can be avoided if the project manager knows all impacts in different project phases.

The price calculation step was one of the major issues discussed in the CSA interviews and the initial proposal workshops. Currently there are no official guidelines for pricing and there is a great deal of fluctuation with margins between the customers and the project managers. It was concluded in the workshops that the aftersales spare part price list will be implemented to the additional order material price calculation. This requires instructions or guidelines for the target margins because prices in the aftersales list are too high to be used in the new build projects directly. Target margins can be applied to the projects where there are not pre-defined price lists for materials available. Also, the project managers



should still have full authority over the price calculation according to the customer. In addition to the material pricing guidelines, there should be target margins for quoted design work. This includes for example electrical design and project design.

The first improvement found in the workshops for the quotation making and sending process step is the additional order information in SOLE. Now there is not any information available regarding the value and amount of the quoted additional orders. Only the project managers are aware of their own quoted additional orders and there is not any visibility to the rest of the case company. This could be solved by adding an own tab or sheet for the quoted additional orders to SOLE. When the project manager sends a quotation to the customer, quotation information could be added to the own tab in SOLE. If the customer sends a purchase order, then the quotation could be marked as ordered and it can be added to the project's invoicing information. This would make the additional order pipeline transparent to everyone who needs the information. Also, there would be record for the project managers regarding the quoted additional orders.

The second improvement for the quotation making and sending process step is a common quotation template. As stated in the CSA, currently all the project managers are using their own additional order quotation templates. The unanimous opinion in the workshops was that a common quotation template is needed and it has to be created. The details of the new quotation template weren't discussed in detail and it was concluded that it will require additional workshop outside the scope of this study. A common quotation template would give a better picture of the case company towards the customers and it would make quotation easier for the new the project managers.

The last improvement suggestion concerns the additional order costs and their follow-up in SOLE. Currently there is not any separation between the normal project costs and the additional order costs. Because of this, the actual profitability of the additional orders is not known. To fix this issue, functions to

SOLE should be added to follow-up the additional order project costs. This would include the additional order material costs and labour costs. It appeared in the workshops that the cost follow-up may cause a great deal of extra work for the project managers and the rest of the project team. The cost follow-up in SOLE could be tested as a pilot project to see the amount of extra work before making a wider implementation. The cost follow-up would give valuable information regarding the additional order profitability and it could be used to develop pricing.

### 5.2.3 Additional Order Process Ownership

As stated in the conceptual framework, a process needs an owner. It was decided in the workshops that Senior Manager, Projects is suitable person for the additional order process ownership. Table 10 shows the process owner's activities.

Table 10. Additional order process ownership activities

<b>ADDITIONAL ORDER PROCESS OWNERSHIP ACTIVITIES</b>	
<b>Process owner's activities</b>	<b>Activity description</b>
Process development	<ul style="list-style-type: none"> <li>• Process development together with top management and according to the feedback from the project managers.</li> </ul>
Target margin definition	<ul style="list-style-type: none"> <li>• Set target margins for the additional order sales where applicable.</li> </ul>
Follow-up the additional order sales and costs	<ul style="list-style-type: none"> <li>• Follow-up the additional order sales and profitability are according to the targets where applicable.</li> </ul>
Gather the information related to the additional orders	<ul style="list-style-type: none"> <li>• Gather and distribute relevant information to the project managers.</li> </ul>
Communication with the sales department	<ul style="list-style-type: none"> <li>• Define what should be quoted in the new build quotation and what in the additional orders.</li> </ul>

As seen in Table 10, total of five activities were concluded in the workshops. The additional order process improvements need to be implemented before the process owner can properly perform the activities described in Table 10. More detailed descriptions of the activities are in the paragraphs below.

The process development can be started by agreeing the improvement suggestions with the top management, which is in this case Director, Marine Business. Once all the improvements are agreed, they can be implemented in co-operation with the project management team. The future improvements should be done according to the feedback from the project managers and possibly from the other stakeholders.

The target margins can be defined with the price calculation guidelines and they should be updated accordingly once there is more data available regarding the additional order profitability. The target margins cannot be applied to all customers because some customers have pre-defined price lists. Also, the customer's price level history needs to be considered if the prices will be significantly increased. The target margins can be easily applied for the customers without pre-defined price lists and with a history of relatively high margin levels. Even with the target margins applied, the project managers should have full authority and consideration over the margins as they have the best knowledge of the customers.

The follow-up of the additional order sales and profitability requires the modifications to SOLE before the follow-up can be done properly. If the additional orders and their costs would be available in SOLE, it would help to set the target margins. Also, the project managers could develop the quoting if it is found out that costs were higher than expected in the quoting phase.

Gathering and distributing relevant information regarding the additional orders would be beneficial for the project managers. Currently the project managers do not know much about the additional orders or price levels of each other, which is an issue for example during the backup situations. This is not an easy activity to do and it would require a system where everyone could see the additional order sales prices and margins.

Communication with the sales department could start with agreeing the ground rules what is quoted in the new build quotations and what is quoted during the

project. Now there is not any rules established and there has been a few issues regarding the pricing because the new build prices usually differ from the additional order prices. This concerns mainly pro-actively sold items, which were mentioned in the process improvement suggestions.

#### 5.2.4 Additional Order Process KPIs

General opinion during the workshops was that it is not easy to come up with KPIs, which are not involving any financial information. In the end, the additional order process is a sales process. Anyhow, in addition to the financial metrics, a few KPIs were concluded in the workshops. KPIs are shown in Table 11.

Table 11. Additional order process KPIs

<b>ADDITIONAL ORDER PROCESS KPIs</b>	
<b>KPI</b>	<b>KPI description</b>
The customer satisfaction	<ul style="list-style-type: none"> <li>• Include the additional order sales during the project to the customer satisfaction survey.</li> </ul>
Quotation hit rate	<ul style="list-style-type: none"> <li>• Analyze the hit rate percentage of the additional order quotations.</li> </ul>
Process and Enterprise Maturity Model (PEMM)	<ul style="list-style-type: none"> <li>• Analyze the process with PEMM-tool.</li> </ul>
The project managers opinion	<ul style="list-style-type: none"> <li>• After process development, the project managers opinions regarding the changes can be analyzed.</li> </ul>

In Table 11, total of four KPIs can be used to measure the additional order process. All of them require development in the additional order process and they cannot be applied immediately. After the suggested improvements have been implemented, it is possible to start to measure the process at least in some extension.

The first KPI concerns the customer satisfaction. Currently, the case company has not involved the additional order sales to the customer satisfaction survey. Adding a question regarding the additional orders to the survey could be one metric for the additional order process. It wouldn't give direct measurement for

the process development, but it would give some input of how the customers feel about the sales during project.

A quotation hit rate would give valuable information for analysing the reasons why the customers have not ordered certain quotation. Normally, the customers order almost all quoted additional orders because the need comes from the customers. In case of pro-active sales, it is more common that the customers do not make the order. The quotation hit rate would be perfect for analysing the quotations regarding the pro-active sales or otherwise special quotations. To calculate hit rates, SOLE would need functions for the additional order follow-up, so currently calculation is not possible.

Process and Enterprise Maturity model (PEMM) could be used to evaluate the additional order process. In addition to process the maturity evaluation, it is possible to evaluate process-based transformations. The additional order process could be evaluated now and after the improvements have been implemented to see if there are any positive changes. PEMM-tool can be found from Appendix 2.

The last KPI is to gather information from the project managers regarding the additional order process improvements. This could be a workshop, team meeting or any other form where implemented improvements can be evaluated. Subjects for discussion could involve questions shown in the list below.

- Are the improvements making the additional order work faster?
- Are the new ways of working easier than the ways before?
- Is there anything to change with the new tools or old tools?

The main point in the opinion is to keep the process development constant. If the opinions are not considered, the process development may have negative effects in the end.

### 5.3 Summary of the Initial Proposal

Collaboration in the initial proposal workshops was successful and findings in the current state analysis were covered. The additional order process was verified and developed by the stakeholders, improvements were concluded, process ownership was established and a few KPIs were decided. Section 6 describes the validation of the initial proposal.

## 6 Validation of the Initial Proposal

This section describes how the initial proposal was reviewed by the case organization's management team. The first part is the overview of the proposal validation stage, the second part is the management feedback to the initial proposal and the last part is the final proposal based on the feedback.

### 6.1 Overview of the Proposal Validation Stage

The initial proposal was presented to the Senior Manager, Projects and to the Director, Marine Business. The presentation was done in a face-to-face meeting and all parts of the initial proposal were reviewed. The discussion concentrated on the improvement suggestions for the additional order process and the other parts of the initial proposal were dealt with lighter detail. The meeting was recorded and field notes were done based on the meeting recording. This generated Data 3 for this study.

The Data 3 field notes were analysed in the following feedback chapter. Based on the feedback, the initial proposal was updated where necessary and final proposal was generated. The updates for the proposal were quite minor and generally most of the suggestions were accepted.

### 6.2 Feedback to the Initial Proposal

The proposal validation meeting was started by quickly presenting the thesis on a general level. The feedback was good and the thesis subject was kept important by the management. All meeting attendees agreed that the additional order process needs more attention from the case company and the thesis gives a good idea of what needs to be done. One feedback for the conceptual framework was the lack of theory regarding the sales during the project execution phase. The author did not find any suitable theory for that.

The additional order process map was not checked that thoroughly because it concerns more the project managers than the senior and director level

management. Also, the process map was already updated in the initial proposal phase. Therefore, no changes to the process map were made.

The improvement suggestions for the additional order process were the biggest discussion topic in the meeting. Especially the subject regarding the system where the information of the quoted additional orders should be located raised much discussion.

It was highlighted that the sales and the project departments should have a clear understanding of what pro-active sales items can be quoted and when they should be quoted. Practically this means, should the items be quoted in the new build quotation, during the project or by the aftersales after the project completion. This requires more co-operation between the sales and the project departments as currently the situation is not that clear. Other highlighted item was that the quality of the quotations should be equal and everything should be taken into account. This can be tackled if there would be guidelines what needs to be considered for the quotations.

It was approved that the aftersales spare part price list can be implemented for the additional order use. One default pricing structure should be established for general use and the customer specific pricing should be done together with the sales department. It was discussed that the sales should be more involved in the pricing than they are now.

The main debate was concerning the location for the quoted additional order information. The initial proposal was to establish an own tab or sheet for the additional orders in SOLE, but this was not unanimously accepted. It was suggested that the quoted additional order information should be saved to iScala. This improvement suggestion was not closed and it requires further discussion. Saving the quoted additional order information was concluded to be one of the top priorities in the improvement suggestions. Updating the functions to SOLE for the additional order cost follow up was briefly discussed. If functions are easily



modified, it was concluded that piloting the cost follow-up would be a good starting point.

The additional order process ownership activities were discussed briefly in the meeting. Gathering and distributing the information was concluded to be important especially regarding the holiday back-ups and when personnel is changing. Communication with the sales department was seen important and there should be more information exchanged between the sales and the project departments. The communication is essential when planning the new pricing.

It was concluded that one item needs to be added and one item to be removed from the additional order process KPIs. The conclusion was that there is no need for a separate customer opinion regarding the additional order sales. This could lead to negative feedback from the customers and may give them image that everything is not included in the project scope. Also, the additional order sales can be seen as extra costs by the customers. One KPI to be added was the information is the quotation pro-active sales or not. With this information it is possible to follow-up how much pro-active sales is done and to set pro-active sales targets.

### 6.3 Final Proposal

A total of six items were modified in the improvement suggestions, the process ownership and the KPIs. All recommendations for the additional order improvements were gathered in Table 12 below. The additional order process map is not shown here because there were not any changes for that in the proposal validation.

Table 12. Final recommendations for the additional order process

<b>IMPROVEMENT SUGGESTIONS FOR THE ADDITIONAL ORDER PROCESS</b>	
<b>Process Step</b>	<b>Improvement Suggestions</b>
Demand for scope change or pro-active sales in the ongoing project	<ul style="list-style-type: none"> <li>• A List of items what can be sold pro-actively and on what stage of the project they can be sold</li> <li>• Supporting documentation for pro-active sales</li> </ul>
The project manager checks what is needed for the additional order	<ul style="list-style-type: none"> <li>• Instructions or checklist what needs to be considered when preparing quotation</li> </ul>
The project manager calculates price for the quotation	<ul style="list-style-type: none"> <li>• Default pricing structure based on aftersales spare part price list</li> <li>• Common understanding of acceptable margins, discounts and the customers</li> <li>• Co-operation with the sales department regarding the pricing</li> </ul>
The project manager makes the quotation and sends it to the customer	<ul style="list-style-type: none"> <li>• An own tab to project finance tool for the quoted additional orders or the use of ERP</li> <li>• A common quotation template</li> </ul>
The project manager saves the purchase order to project archive and adds invoicing and cost details to the project's financial information	<ul style="list-style-type: none"> <li>• Functions to project finance tool for the additional order costs follow up</li> </ul>
<b>THE ADDITIONAL ORDER PROCESS OWNERSHIP ACTIVITIES</b>	
<b>Process owner's activities</b>	<b>Activity description</b>
Process development	<ul style="list-style-type: none"> <li>• Process development together with top management and according to the feedback from the project managers</li> </ul>
Target margin definition	<ul style="list-style-type: none"> <li>• Set target margins for the additional order sales where applicable</li> </ul>
Follow-up the additional order sales and costs	<ul style="list-style-type: none"> <li>• Follow-up the additional order sales and profitability are according to the targets where applicable</li> </ul>
Gather the information related to the additional orders	<ul style="list-style-type: none"> <li>• Gather and distribute relevant information to the project managers</li> </ul>
Communication with the sales department	<ul style="list-style-type: none"> <li>• Define what should be quoted in the new build quotation and what in the additional orders</li> <li>• Define the additional order pricing</li> </ul>
<b>THE ADDITIONAL ORDER PROCESS KPIS</b>	
<b>KPI</b>	<b>KPI description</b>
The additional order demand from the customer or pro-active sales	<ul style="list-style-type: none"> <li>• Information is the quotation pro-active sales or not</li> </ul>
Quotation hit rate	<ul style="list-style-type: none"> <li>• Analyze the hit rate percentage of the additional order quotations</li> </ul>
Process and Enterprise Maturity Model (PEMM)	<ul style="list-style-type: none"> <li>• Analyze the process with PEMM-tool.</li> </ul>
The project managers opinion	<ul style="list-style-type: none"> <li>• After process development, The project managers opinions regarding the changes can be analyzed.</li> </ul>

As shown on Table 12, the changes for the recommendations according to the proposal validation are not big. Three modifications were done to the improvement suggestions. The project stage information was added to the first item in the list. The price calculation step suggestions were rewritten with added suggestions according to the feedback. The last modification for improvement suggestions was adding the ERP in the fourth item in the list.

There was only one minor modification for the process owner activities. For the communications with the sales department, activity for defining the additional order pricing was added.

For the KPIs, one KPI was removed and one added. The KPI regarding the additional order customer feedback was removed according to the validation meeting outcome. The KPI regarding the information, is the additional order quotation pro-active sales or not, was added. The seventh section of the thesis consists of executive summary, practical next step recommendations to the management and self-evaluation of the thesis.

## 7 Discussion & Conclusions

The last section of this thesis consists of executive summary, practical next step recommendations and self-evaluation of the thesis project credibility.

### 7.1 Executive Summary

The objective of this thesis was to improve the additional order process in the case company's marine & offshore projects. The additional order sales are done during the project execution phase by the project managers. The additional orders form a significant part of the case company's marine business revenue and the process has several defects, which needed improving. The research question for this thesis was to find out the defects and improve them in the current additional order process.

The selected research approach for this thesis was design research, which suits well for business process improvement. Qualitative methods were used for data collection. The thesis included four main stages. The first stage was the current state analysis of the additional order process and the outcome from that was the strengths and the weaknesses of the process. The second stage was to find improvement ideas to the additional order process from the relevant literature to form the conceptual framework. The third step was to create the initial proposal for the improved additional order process based on the ideas from the conceptual framework. The fourth step was to validate the initial proposal with the management to get feedback for the final proposal.

The current state analysis was conducted by arranging Teams interviews with the relevant stakeholders. The interview findings were analysed to map the current additional order process and to gather the strengths and the weaknesses of the process. In addition to the process map, each step of the process was described in detail. The strengths and the weaknesses were summarized and lack of process description was the weakness, which was selected to be improved. The improvement ideas regarding process improvement, process description and

business process development were searched from the relevant literature. The ideas were formed the conceptual framework of the thesis.

The initial proposal for the improved additional order process was co-created in two workshops with the same stakeholders as the current state analysis interviews. The workshops included analysis of the additional order process map, defining improvements for different process steps, defining process owner's activities and discussion of the process KPIs. The workshop conversations were analysed and an initial proposal was created. The initial proposal included updated process map, process improvement recommendations, process owner's activities and KPIs.

The additional order process map was not changed radically after the initial workshop analysis. The changes were updated to process steps where applicable and the changes were also described in detail. The detail level of the map was kept on a general level to avoid complexity. Improvement suggestions were created for five different additional order process steps. The suggestions were kept on a reasonable level and unrealistic suggestions were excluded. The suggestions included improvements for pro-active sales, pricing, guidelines for quoting, quotation template and the additional order financial follow-up. Pricing and financial follow-up were the most important improvement suggestions.

A total of five process owner's activities were generated in the workshops. Activities involved the additional order process development, target margin setting, the additional order sales follow-up, gathering and distributing information and communication with the sales department. A total of four additional order process KPIs originated from the workshops. The KPIs were the customer satisfaction, quotation hit rate, use of Process and Enterprise Maturity Model and the project manager's opinion.

The initial proposal was validated in a meeting with the management. The meeting included general presentation of the thesis and its improvement suggestions, process owner's activities and the KPIs were discussed. The

process map was not analysed as it is not that relevant for the management. Feedback from the management was generally positive and only few adjustments were made to the initial proposal. Three small adjustments were made to improvement suggestions, the additional order pricing definition was added to process owner's activities, the customer feedback KPI was removed and information regarding the quotation's pro-active sales was added.

The final proposal has useful improvement suggestions, which can be implemented quite easily. Once those are in place, process owner's activities and KPIs can be fully implemented. The process map is useful for new employees and it can be easily modified to some other form if needed. The additional order process map, improvement suggestions, process owner's activities and KPIs give a good starting point for further process development.

## 7.2 Practical Next Step Recommendations

The implementations of recommendations should be started from the improvement suggestions. Many items in the process ownership activities and KPIs require that functions in SOLE or iScala are implemented. Also, the improvement suggestions are the most important items regarding the priority of the implementation.

Implementation of the improvement suggestions can be started from the creation of the default pricing structure. That does not require investments and the effects can be seen immediately. This would help the project managers with the pricing and it should have positive impact on the additional order profitability. The second implementation should be the creation of common quotation template. This should be an easy task to do and it does not require investments. Workshops with correct stakeholders should be enough to decide the contents of new quotation template.

The third step should be starting the conversation should SOLE or ERP be used for the additional order quotation information. This is the starting point for all follow-up and pipeline creations with the additional orders. The fourth

implementation should be the list of items and information for pro-active sales. This should have a positive impact on the additional order sales and the current situation requires clarification.

Besides the four improvements described in the previous paragraph, it is not reasonable to recommend more prioritization for the additional order process improvements. If the four suggestions are implemented, it is already a huge improvement compared to the current situation.

### 7.3 Evaluation of the Thesis

The evaluation of the thesis is dealt with in the following paragraphs. The first item is the comparison between the outcome and the objective and how well they match. The second item discusses the reliability and validity of the thesis.

#### 7.3.1 Outcome vs. Objective

The objective of this thesis was to improve the current additional order process in marine & offshore projects. It was based on the commonly known fact within the case company that there are things to improve in the additional order process. The current state analysis was conducted by interviewing the stakeholders and the outcome from the interviews verified that there is plenty of room for improvement. As process improvement is a wide subject, it was not immediately clear after the CSA on which weakness or weaknesses to improve. It was decided with the thesis supervisor that the additional order process needs a process description and at the same time improvement suggestions can be made to the rest of the weaknesses. The additional order process improvements were to be kept on a general level rather than going deeply to a single weakness detail.

The outcome of this thesis was the additional order process description with a process map, improvement suggestions, process owner's activities and KPIs. The basic ideas for the four different outcome elements were gathered from the academic literature, which formed the conceptual framework. The conceptual framework ideas were discussed in the workshops with the stakeholders and the

outcome from that was the initial proposal. The initial proposal was validated and slightly changed in the meeting with the management forming the final proposal of this thesis.

The outcome of the thesis meets well with the objective of the thesis. The final proposal includes the process description, which was the main thing to improve and it also includes the improvement suggestions to the other issues found in the CSA. The challenge after the thesis completion will be the implementation of the final proposal in the case company.

### 7.3.2 Reliability and Validity

A design research approach was selected to this thesis, because it supports the practical nature of the business problem and it aims to improve business operations. It appeared that there was not any documentation available regarding the additional order process, therefore only qualitative methods for data collection were used in this thesis. In this case qualitative methods were interviews, workshops and one meeting. The author has seven years of experience working in the case company in various positions and at the time of this thesis, less than two years of experience in working as a project manager. The thesis was made without preconceptions and it is based on the interview data and not to the author's opinions or experience.

All relevant stakeholders were interviewed in Data 1 to make sure that everyone's personal point of view would be considered in the CSA. This way it was possible to define the current additional order process, its strengths and its weaknesses in a reliable way. The customers were deliberately excluded from the thesis information sources because of the big differences between them. The customers are global and each of them have their own specific way of dealing with the additional orders. The literature sources for the conceptual framework were taken from reliable sources to give a solid ground to form the initial proposal. The lack of reference related directly to the additional order sales can be seen as a defect.



Data 2 workshops to make the initial proposal were held with lesser number of attendants than the CSA interviews. It was not possible to get all nine people to attend at the same time to the workshops, therefore it was reasoned decision to limit the attendant amount. All parts of the conceptual framework were discussed in the workshops and based on the workshop fieldnotes, the CSA and the conceptual framework; initial proposal was created. Data 2 together with the conceptual framework are forming reliable base for the created initial proposal.

Data 3 was done in the validation phase of the initial proposal. A meeting was conducted with the management and they gave approval and development ideas for the initial proposal. The meeting was slightly too short, but all the main points were thoroughly discussed. The final proposal was made according to the field notes from Data 3.

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**Data 1 Interview Questions**




1. Describe the additional order process in marine projects from beginning to the end and what happens between?
2. What weaknesses there are in the additional order process?
3. What strengths there are in the additional order process?
4. What would you improve in the additional order process?
5. What would you definitely not change in the additional order process?
6. Free comments regarding the additional order process?

## The Process and Enterprise Maturity Model (Hammer, 2007)

To be used in conjunction with "The Process Audit" by Michael Hammer (HBR April 2007, Reprint R0704H).			
How Mature Are Your PROCESSES?		You can evaluate the maturity of a business process and determine how to improve its performance by using this table. Decide how the statements defining the strength levels, from P-1 to P-4, for each enabler apply to the process that you	
		P-1	P-2
<b>Design</b>	Purpose	The process has not been designed on an end-to-end basis. Functional managers use the legacy design primarily as a context for functional performance improvement.	The process has been redesigned from end to end in order to optimize its performance.
	Context	The process's inputs, outputs, suppliers, and customers have been identified.	The needs of the process's customers are known and agreed upon.
	Documentation	The documentation of the process is primarily functional, but it identifies the interconnections among the organizations involved in executing the process.	There is end-to-end documentation of the process design.
<b>Performers</b>	Knowledge	Performers can name the process they execute and identify the key metrics of its performance.	Performers can describe the process's overall flow; how their work affects customers, other employees in the process, and the process's performance; and the required and actual performance levels.
	Skills	Performers are skilled in problem solving and process improvement techniques.	Performers are skilled in teamwork and self-management.
	Behavior	Performers have some allegiance to the process, but owe primary allegiance to their function.	Performers try to follow the process design, perform it correctly, and work in ways that will enable other people who execute the process to do their work effectively.
<b>Owner</b>	Identity	The process owner is an individual or a group informally charged with improving the process's performance.	Enterprise leadership has created an official process owner role and has filled the position with a senior manager who has clout and credibility.
	Activities	The process owner identifies and documents the process, communicates it to all the performers, and sponsors small-scale change projects.	The process owner articulates the process's performance goals and a vision of its future; sponsors redesign and improvement efforts; plans their implementation; and ensures compliance with the process design.
	Authority	The process owner lobbies for the process but can only encourage functional managers to make changes.	The process owner can convene a process redesign team and implement the new design and has some control over the technology budget for the process.
<b>Infrastructure</b>	Information Systems	Fragmented legacy IT systems support the process.	An IT system constructed from functional components supports the process.
	Human Resource Systems	Functional managers reward the attainment of functional excellence and the resolution of functional problems in a process context.	The process's design drives role definitions, job descriptions, and competency profiles. Job training is based on process documentation.
<b>Metrics</b>	Definition	The process has some basic cost and quality metrics.	The process has end-to-end process metrics derived from customer requirements.
	Uses	Managers use the process's metrics to track its performance, identify root causes of faulty performance, and drive functional improvements.	Managers use the process's metrics to compare its performance to benchmarks, best-in-class performance, and customer needs and to set performance targets.

<p>are assessing. If a statement is largely true (at least 80% correct), color the cell green; if it is somewhat true (between 20% and 80% correct), shade the cell yellow; and if it is largely untrue (less than 20% correct), mark the cell red.</p>						
		 <b>GREEN:</b> largely true	 <b>YELLOW:</b> somewhat true	 <b>RED:</b> largely untrue		
<b>P-3</b>	<b>P-4</b>	<b>P-1</b>	<b>P-2</b>	<b>P-3</b>	<b>P-4</b>	
The process has been designed to fit with other enterprise processes and with the enterprise's IT systems in order to optimize the enterprise's performance.	The process has been designed to fit with customer and supplier processes in order to optimize interenterprise performance.					
The process owner and the owners of the other processes with which the process interfaces have established mutual performance expectations.	The process owner and the owners of customer and supplier processes with which the process interfaces have established mutual performance expectations.					
The process documentation describes the process's interfaces with, and expectations of, other processes and links the process to the enterprise's system and data architecture.	An electronic representation of the process design supports its performance and management and allows analysis of environmental changes and process reconfigurations.					
Performers are familiar both with fundamental business concepts and with the drivers of enterprise performance and can describe how their work affects other processes and the enterprise's performance.	Performers are familiar with the enterprise's industry and its trends and can describe how their work affects interenterprise performance.					
Performers are skilled at business decision making.	Performers are skilled at change management and change implementation.					
Performers strive to ensure that the process delivers the results needed to achieve the enterprise's goals.	Performers look for signs that the process should change, and they propose improvements to the process.					
The process comes first for the owner in terms of time allocation, mind share, and personal goals.	The process owner is a member of the enterprise's seniormost decision-making body.					
The process owner works with other process owners to integrate processes to achieve the enterprise's goals.	The process owner develops a rolling strategic plan for the process, participates in enterprise-level strategic planning, and collaborates with his or her counterparts working for customers and suppliers to sponsor interenterprise process-redesign initiatives.					
The process owner controls the IT systems that support the process and any projects that change the process and has some influence over personnel assignments and evaluations as well as the process's budget.	The process owner controls the process's budget and exerts strong influence over personnel assignments and evaluations.					
An integrated IT system, designed with the process in mind and adhering to enterprise standards, supports the process.	An IT system with a modular architecture that adheres to industry standards for interenterprise communication supports the process.					
Hiring, development, reward, and recognition systems emphasize the process's needs and results and balance them against the enterprise's needs.	Hiring, development, reward, and recognition systems reinforce the importance of intra- and interenterprise collaboration, personal learning, and organizational change.					
The process's metrics as well as cross-process metrics have been derived from the enterprise's strategic goals.	The process's metrics have been derived from interenterprise goals.					
Managers present the metrics to process performers for awareness and motivation. They use dashboards based on the metrics for day-to-day management of the process.	Managers regularly review and refresh the process's metrics and targets and use them in strategic planning.					

To be used in conjunction with "The Process Audit" by Michael Hammer (HBR April 2007, Reprint R0704H).			
How Mature Is Your ENTERPRISE?		To determine if your organization is ready to support a process-based transformation, evaluate the statements in this table. They show the strength levels, from E-1 to E-4, of the capabilities that enterprises need in order to develop their busi-	
		E-1	E-2
<b>Leadership</b>	Awareness	The enterprise's senior executive team recognizes the need to improve operational performance but has only a limited understanding of the power of business processes.	At least one senior executive deeply understands the business process concept, how the enterprise can use it to improve performance, and what is involved in implementing it.
	Alignment	The leadership of the process program lies in the middle management ranks.	A senior executive has taken leadership of, and responsibility for, the process program.
	Behavior	A senior executive endorses and invests in operational improvement.	A senior executive has publicly set stretch performance goals in customer terms and is prepared to commit resources, make deep changes, and remove roadblocks in order to achieve those goals.
	Style	The senior executive team has started shifting from a top-down, hierarchical style to an open, collaborative style.	The senior executive team leading the process program is passionate about the need to change and about process as the key tool for change.
<b>Culture</b>	Teamwork	Teamwork is project focused, occasional, and atypical.	The enterprise commonly uses cross-functional project teams for improvement efforts.
	Customer Focus	There is a widespread belief that customer focus is important, but there is limited appreciation of what that means. There is also uncertainty and conflict about how to meet customers' needs.	Employees realize that the purpose of their work is to deliver extraordinary customer value.
	Responsibility	Accountability for results rests with managers.	Frontline personnel begin to take ownership of results.
	Attitude Toward Change	There is growing acceptance in the enterprise about the need to make modest change.	Employees are prepared for significant change in how work is performed.
<b>Expertise</b>	People	A small group of people has a deep appreciation for the power of processes.	A cadre of experts has skills in process redesign and implementation, project management, communications, and change management.
	Methodology	The enterprise uses one or more methodologies for solving execution problems and making incremental process improvements.	Process redesign teams have access to a basic methodology for process redesign.
<b>Governance</b>	Process Model	The enterprise has identified some business processes.	The enterprise has developed a complete enterprise process model, and the senior executive team has accepted it.
	Accountability	Functional managers are responsible for performance, project managers for improvement projects.	Process owners have accountability for individual processes, and a steering committee is responsible for the enterprise's overall progress with processes.
	Integration	One or more groups advocate and support possibly distinct operational improvement techniques.	An informal coordinating body provides needed program management while a steering committee allocates resources for process redesign projects.

<p>ness processes. If a statement is at least 80% correct, color the cell green; if it is between 20% and 80% correct, shade it yellow; and if it is less than 20% correct, make it red.</p>					
		GREEN: largely true	YELLOW: somewhat true	RED: largely untrue	
E-3	E-4	E-1	E-2	E-3	E-4
The senior executive team views the enterprise in process terms and has developed a vision of the enterprise and its processes.	The senior executive team sees its own work in process terms and perceives process management not as a project but as a way of managing the business.				
There is strong alignment in the senior executive team regarding the process program. There is also a network of people throughout the enterprise helping to promote process efforts.	People throughout the enterprise exhibit enthusiasm for process management and play leadership roles in process efforts.				
Senior executives operate as a team, manage the enterprise through its processes, and are actively engaged in the process program.	The members of the senior executive team perform their own work as processes, center strategic planning on processes, and develop new business opportunities based on high-performance processes.				
The senior executive team has delegated control and authority to process owners and process performers.	The senior executive team exercises leadership through vision and influence rather than command and control.				
Teamwork is the norm among process performers and is commonplace among managers.	Teamwork with customers and suppliers is commonplace.				
Employees understand that customers demand uniform excellence and a seamless experience.	Employees focus on collaborating with trading partners to meet the needs of final customers.				
Employees feel accountable for enterprise results.	Employees feel a sense of mission in serving customers and achieving ever-better performance.				
Employees are ready for major multidimensional change.	Employees recognize change as inevitable and embrace it as a regular phenomenon.				
A cadre of experts has skills in large-scale change management and enterprise transformation.	Substantial numbers of people with skills in process redesign and implementation, project management, program management, and change management are present across the enterprise. A formal process for developing and maintaining that skill base is also in place.				
The enterprise has developed and standardized a formal process for process redesign and has integrated it with a standard process for process improvement.	Process management and redesign have become core competencies and are embedded in a formal system that includes environment scanning, change planning, implementation, and process-centered innovation.				
The enterprise process model has been communicated throughout the enterprise, is used to drive project prioritization, and is linked to enterprise-level technologies and data architectures.	The enterprise has extended its process model to connect with those of customers and suppliers. It also uses the model in strategy development.				
Process owners share accountability for the enterprise's performance.	A process council operates as the seniormost management body; performers share accountability for enterprise performance; and the enterprise has established steering committees with customers and suppliers to drive interenterprise process change.				
A formal program management office, headed by a chief process officer, coordinates and integrates all process projects, and a process council manages interprocess integration issues. The enterprise manages and deploys all process improvement techniques and tools in an integrated manner.	Process owners work with their counterparts in customer and supplier enterprises to drive interenterprise process integration.				