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Improving Sales Through Sales Process Development

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The best time of my life is right now. This is the last page written, not the last page but the page written last. In my preface I would like to thank the whole class of 2014. They made my academic year a ride that I enjoyed so much. The class had so much potential from day one, and the potential is cashing in on the last days when most of us are returning their Thesis.

The starting point of this Thesis was to design a portal to support calibration business processes. During the current state analysis it became clear that a tool for a process that has not yet been defined clear enough is not possible. So a process had to be developed first. When thinking about a process, many things come to mind. The modelling of business processes is not so simple and straightforward as one could imagine. But the actual presentation of the process is the hardest one. The modelling of sales process is difficult enough, but when it is a really different than the normal sales process, I found it my biggest learning from this project how to present it so that it would be clear enough. Luckily, my case company has great experts who were eager to share their experience so I received help from them to shape this common vision.

The best thing about this whole project was the support from both case company and my supervisor, Dr Juha Haimala. I would like to thank him for this patience and insightful suggestions that helped to find the right way.

I must add an additional thank you to my future wife who I am engaged to in November. She has supported me at home in the way nobody could.

Jari Lindgren
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This Thesis explores the possibilities to improve the sales process, including selling, offering and final delivery processes. The current sales process is based on a conventional phone call or e-mail offering, so that contacting customers on time starts becoming a challenge, since no process is in place. Therefore, the purpose of this thesis is to define a new sales process for the case company's department of In-Site calibration of testing machine that would enable the improvement for selling and contacting the customers.

This Thesis applies a case study as its research approach. It is qualified as a case study since this Thesis focusses on a contemporary phenomenon that corresponds to the inquiry about the processes of operation in the case company, in the context of the In-Site calibration of Testing Machines department. This approach allows bringing together various types of data coming from multiple sources such as interviews, customer surveys, personal observations, and other types of data. During this study, the researcher interviewed two service technicians, three managers, held a group meeting, and met and discussed with six handpicked customers. The additional data source was benchmarking. For this study, the researcher benchmarked six companies, from which two were operating in different area of services and four are direct or indirect competitors.

The outcome of this Thesis is a proposal of a new process for the case company department of calibration. The current state analysis revealed that the current processes were never defined or designed, instead they were just moulded by time. Thus, this Thesis fulfils this shortage by proposing a process that includes all the necessary parts that are important for the sales process such as improved visibility of customer data, suggested point where to make additional sales propositions, and) and the parts that enable additional selling and effective value proposition suggestions to customers.

Keywords	Calibration, Verification, Business Process Management

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1 Introduction

This Thesis explores the possibilities to improve and facilitate selling, offering and final delivery processes of the case company services. The current sales process is based on a conventional phone call or e-mail offering, so that contacting customers on time has started becoming a challenge, since a well-designed process is missing. Yet some of the activities are mandatory for the customers to fulfill due to legislative requirements, both in commercial business and in fulfilling technical requirements, and thus necessary to maintain equipment accreditation. Therefore, a well-defined sales process is needed to sell and simultaneously handle customer schedules and contacts.

1.1 Case Company of the Study

The case company of this study is a Finnish government owned services company VTT Expert Services Ltd. It operates mainly in domestic service business, but has some small portion of the business coming from Europe. The company's main services are expert consulting services, testing services, certification services, and calibration services. The case company operates as part of VTT Group and is a strait subsidiary of VTT Technical Research Centre of Finland Ltd.

The Thesis focuses on one product range, namely its In-site calibration of testing machines (later Calibration department), which is involved in the process of selling and contacting customers, up-keeping customer catalogue and delivering end-results to customers. Calibration department is a department that offers calibration of force, different length measurement gauges, hardness measuring machines, and charpy-impact hammers. All calibration services are accredited by Finnish Accreditation Service FINAS with an accreditation number K024.

1.2 Business Problem

Currently, the case company admits that all problems in Calibration department derive from one specific problem. The problem is that there is no systematic sales process for selling services, contacting customers, and up-keeping the customer catalogue. The calibration/service intervals, although set by the customer, are followed throughout the

time really strictly and are one point of inspection of department customers when they audit they own operations. Moreover, the process that calibration department follows currently when giving certificates is time consuming and therefore expensive.

There is still another problem to mention. It is a side problem that the reader has to keep in mind during study. It is differentiation among other service providers. All current service providers in this field basically have a competing offer of the same services, and delivered in the same way, with no meaningful differences towards customers. Thus, ideally, the case company's solution should differentiate among other providers.

1.3 Objective and Outcome

The aim of this study is to explore possible solutions for creating an improved process for sales, communication and interaction with customers. This exploration is done by first analysing how selling and value proposition are currently done, and then identifying what changes can be made to offer customers more value at the reduced cost, and improve ties to selling activities.

The objective of this Thesis is to propose an ideal sales process that would cover sales, timetable control, resource management and facilitate communication with the customer, so that the case company can benefit from it. If the proposed sales process is found useful and utilized, the case company can start searching for the best suited technical solution to support it (for example, a web-portal). In such a solution, the case company can select and take up the best suitable process items from the aspects proposed in this Thesis. Thus, the eventual goal is to improve the sales process by developing a solution for a better process implementation and tools.

The outcome of this Thesis is a proposal of an ideal sales process that would improve interaction with the customer, selling of both requested services and also additional services, handling customer annual calibration intervals, and result distribution. The draft model for a possible solution includes signals in the case company sales process that start the sales activities, which in practice means the knowledge that calibration technicians have to have in hand during the sales preparations, and the information that would facilitate additional sales. The proposed solutions are examined against customer wishes from earlier customer feedbacks according to customer segmentation, and requirements for operations based on formal instructions in legislative acts, in

standards, in the case company Terms of contract in the current contracts, and requirements for the case company customers of calibration.

1.4 Scope and Structure of the Study

In this Thesis, the emphasis is placed on: a) improving the sales activities in the currently offered services, b) analysis of the current sales and operation processes of the case company, c) requirements and wishes for services from customers and from other sources such as legislation, standards etc., and d) exploration of building well-defined business management processes. The investigation of these four focus areas results in the proposal of a new sales process that includes sub-processes for sales, customer interaction, schedule handling, result and certificate distribution, and ultimately a better defined customer value proposition.

The proposal includes a sales process diagram that covers the whole process from the initial contact point up to invoicing. The software or the tool to achieve this is not discussed in this Thesis. Additionally, discussion on the sourcing of the portal is also left out form the scope of the Thesis. The proposal was validated at the end of this study. The proposal was accepted as a foundation for development of tools and implementation plan.

This Thesis is written in 7 sections. First section is the introduction. Section 2 describes methods and materials used in this study. Section 3 discusses the results of the current state analysis of calibration in the case company. Section 4 presents the existing knowledge on calibration specific requirements, service design, value creation, and business process management. Section 5 presents the proposal for the sales process for the case company and an action plan for the case company to act on, and the results of the validation by the stakeholder in the department. Section 6 contains the summary of the study, practical implications for the case company, and Thesis evaluation.

2 Method and Material

This section describes the research approach, methods of data collection and analysis methods applied in this Thesis. At the end of this section, it presents the reliability and validity plan.

2.1 Research Approach

This Thesis utilizes a case study as its research approach. A case study is an approach that investigates contemporary phenomenon within its actual context in real life by an experimental inquiry (Yin 2003: 13). In this Thesis, the study of a present circumstance coincides to the inquiry about the processes of operation in the case company and particularly in the In-Site calibration of Testing Machines department. A Case study always relies itself on multiple sources of data jointed in a triangulating fashion (Yin 2003: 14). This approach allows bringing together both qualitative and quantitative data from multiple sources such as interviews, customer surveys, personal observations, and other types of data.

Another definition, a broader one, is given by Gerring 2004. In his work he defines that if a researcher refers to his/her work as a case study, then on of the following object must fulfil: (a) that its method is qualitative, (b) that the research is ethnographic, clinical, participant-observation, or otherwise “in the field” (c) that the research is characterized by process-tracing (d) that the research investigates the properties of a single or (e) that the research investigates a single phenomenon, instance, or example. (Gerring 2004: 341-342)

One of the measures to strengthen validity and reliability of the case study research is to point to research code for steering researchers on their studies from the research question to conclusions. (Yin 2003: 105) This approach is frequently used in the research practices, where research design act as an instruction tools for researchers. Using research design as a tool also helps researchers to strengthen their work and to make research more rigours and not to be overwhelmed with the amount of data that is available.

2.2 Research Design

The research design of this study has six stages. The stages are business problem identification, current state analysis, researching best practices, building the proposals, collecting feedback, and building final propositions. Figure 1 illustrates how the research process has progressed and what are outcomes of different stages.

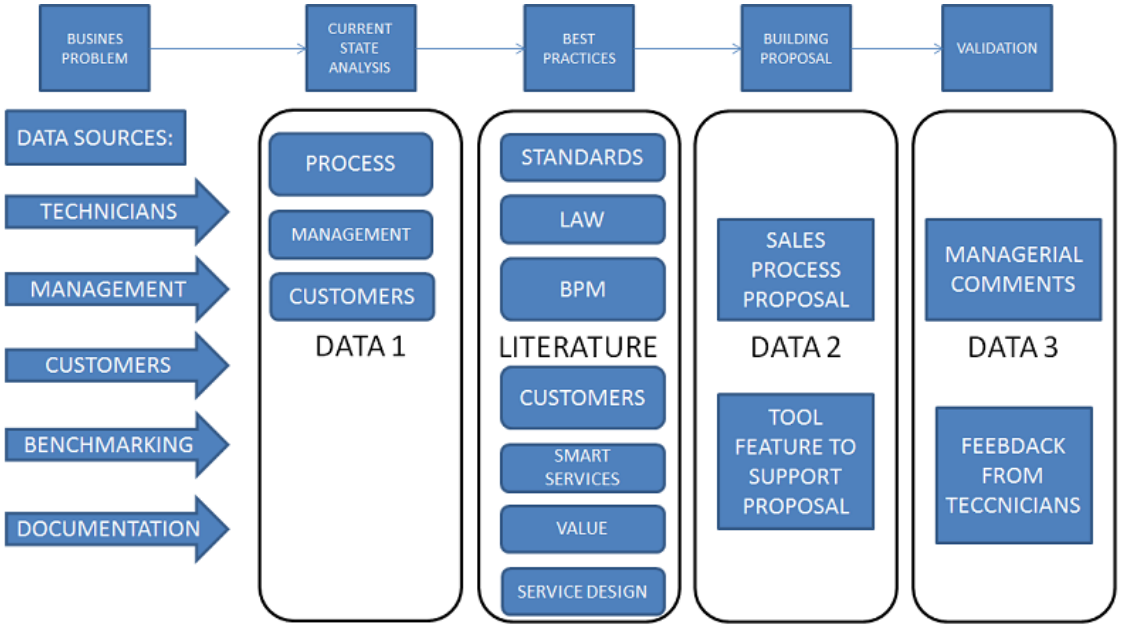


Figure 1. Research design in this study.

As seen from Figure 1, the research starts with business problem identification. This is done by collecting data by customer reviews, employee and managerial interviews, and by benchmarking the competition. In the second stage, current stage analysis, research focuses on making a thorough analysis of the current operating processes, the case company documentation, and interviews with employees. The outcome of the current state analysis is the pros and cons of current processes, the CSA. In the third stage, the researcher focuses on examining current literate to uncover the best practice that are in use and to select the most suitable ones to use in formulating the proposal that would help to improve the sales process of the case company.

The outcome of the third stage is the conceptual framework which is applied when building the proposals. In the fourth stage, the researcher builds a proposal. This first proposal is built by taking into account the information gathered from best practice and benchmarking, as well as the customer and employee suggestions. The proposal also

includes an action plan for the case company how to put the proposed sales process into implementation.

The fourth and final stage is proposal validation, where researcher presents the proposal to case company representative in order to get feedback. This was done on two stages with the managerial presentation separate to the presentation to the technicians.

2.3 Data Collection and Analysis Methods

In order to propose a new sales process that would eventually result in functioning internet based portal, this study collected data in three iterations.

Data collection 1

First, the internal requirements for the proposed model were researched. It was done by examining the data (secondary) from a series of questionnaires conducted in the case company with a selected stakeholders, from meeting minutes that had a recognized a need, and by having a picked interviews with a few department employees. Second, both external and internal needs were researched by examining the results of the interviews conducted both in the case company and with selected customers. In addition to that, more data was gathered by browsing through open questions in the customer reviews.

Thirdly, the case company documentation was examined in the quality manual that regulates every step that all service projects have in common, and in the company official guidelines documentation. In addition to that, the calibration department has their own guidelines, where service specific guidelines are demonstrated. Fourthly, the requirements were examined by conducting interviews with the case company executive officers, and line managers. From them, the researcher gained a focus on the specific problems to be solved, and both specification and financial boundaries. This data collection was focused on identifying how the case company operates know, what are the internal needs for a process development, and what are the customer needs that this research project could address.

Data collection 1 included the following data sources.

A. *Case Company Meetings*

For collecting the business requirements, the researcher firstly examined all meeting minutes that had a need for a either automated service portal that supports customers own business or a portal that would make calibration upkeep and control easier recognized. In the case company, these needs are recorded in a strict matter in meeting minutes data, and in this study they become an initial reference of the need that is to be addressed. Then the case company organized a small both a questionnaire for suitable people and a few interviews with the selected professionals that were thought to have more insight on the matter. The questionnaire had in all together 5 categories and a total of 25 questions (in Appendix X). It was directed to employees who work in direct contact with customers and offer services that are repetitive; even they were not calibration services. The detailed analysis of this data by the researcher became a starting point for building the proposals.

Additionally, the case company held short initial interviews for handpicked professionals that had knowledge of the matter. These interviews are listed in Table 1 below.

Table 1. Case company interviews in collecting secondary data.

Person	Position	Topics	Dates
1	Product manager, services	-what was done in their project -What were the problems they tried to answer -how did it work	- June 2014
2	Development manager, services	- What are the possibilities -What have been used before -what are the pros and cons of different solutions.	- July 2014 - September 2014
3	Infrastructure responsible person, IT	- How can IT help - How do they become involved and in what stage of the project - IT-departments role in competitive bidding	- August 2014 - September 2014 - November 2014

The interviews shown in Table 1 offered a great deal of initial data of what other departments had done, what were the technical solutions in their projects, and can the same solutions be transferred to the case department.

B. Customer Reviews and Interviews

The case company has a fixed process a gathering constant customer feedback and gathering those answers on a yearly based result tables. The feedbacks also consist of open questions that customers can answer whatever they might think is important in when they buy or receive services. These open questions are stored in a database that has all the answers, and can be accessed separately. To gather data researcher skimmed through this data looking for themes other than price related. The details of the interviews are shown in Table 2 below.

Table 2. Interviews had with customers in collecting secondary data.

Customer	Location	Area of business	Duration	Date
1	Turku, Western-Finland	Testing services	2 hours	26.11.2014
2	Turenki, Central-Finland	Casting of Bronze	1 h 30 min	3.12.2014
3	Salo, Southern-Finland	Casting	1 hours	7.1.2015
4	Tikkakoski, Central-Finland	Manufacturing	2 hours	21.1.2015
5	Lohja, Southern-Finland	Manufacturing of Construction materials	2 hours	17.2.2015
6	Läyliäinen, Southern-Finland	Concrete	1 hours	24.2.2015

The data shown in Table 2 includes a series of interviews conducted to handpicked customers. The customers were selected by picking those ones that had answered to the open questions in the normal customer feedback process done after each service. From these interviews, the researcher gained information on customers need, but also on willingness in paying for the internet based portal and different other needs that the customers have concerning the user interface for customers.

C. Case Company Documentation

For examining the current operating model, the researcher examined all the case company and the case department documentation regarding the key elements and of sales, quoting, communication, reporting, and invoicing. As additional documents, the re-

searcher also examined the guides to ERP-System, Traveling system, need identification, and selling. Table 3 overviews the case company documentation used in the study.

Table 3. Case company documentation analysed in the study.

doc. No.	Name of the document	Amount	Describtion
1	VTT Corporate Governance	14 pages	Guidelines of good governance.
2	VTT Expert Services Oy:n toiminnankuvaus	14 pages	Description of VTT Expert Services business idea and industry.
3	HYVÄKSYMISOIKEUDET VTT Expert Services OY:ssä	7 pages	Guideline defining signing of documents, and other approval procedures in VTT Expert Services Ltd.
4	HINNOITTELU 2015	3 pages	Guideline on pricing in VTT Expert Services Ltd.
5	GENERAL TERMS OF CONTRACT	2 pages	General Terms of Contract in VTT Expert Services Ltd.
6	Customer Relationship documentation	13 Documents / 18 pages	All documentation concerning guidelines of how to handle customer case.

D. Interviews and Discussions

The data also includes a series of interviews and discussions in the case company. It includes interviews and discussion with Head of customer relations, Business manager of the case department, Services technicians together and one-to-one, and with Vice president. The interviews and/or discussions included such topics as sales process and costs, communication proactivity, quality systems requirements contra independence, internal needs, possible investment budget, and current competitor situation. Details of the interviews and discussions are shown in Table 4 below.

Table 4. Interviews and discussions with personnel in this study

No.	Company	Dates
1	Head of customer relations	October 2014 January 2015
2	Business manager	December 2014 February 2015
3	Services technicians, group meeting	October 2014
4	Service technician 1	November 2014
5	Service technician 2	November 2014 January 2015
6	Vice President	January 2015 March 2015

In addition to providing data for this research, all the meetings and interviews gave valuable contact point to discuss with stakeholders about the sales, process of the department and how it would be done the best.

Data collection 2 and 3

After this, the next step was to benchmark the existing competition, utilize the improvement suggestions (also collected and separated as Data 2 from the previous data sources), and build and discuss a solution.

E. Benchmark

In this round of the study, it also included benchmarking as a data source. Benchmarking was done by investigating what kind of internet based offering the competition has in the European region. Although not all of the benchmarked companies are direct competitors, they do offer same or similar services within their own region, and so were viewed as suitable for benchmarking. In addition to benchmarking the competition, there were also picked out three companies that have internet based functions that do not operate in the same area of services as the case company does. This was due to gaining information of what is done in the field in a broader point of view. Benchmarking also included a benchmarking the previous development project at the case company. This previous project was well documented and it had a lot of observations done during the project. Details of the companies are shown in Table 5 below.

Table 5. Benchmarked companies used in this study.

No	Company	Area of business	Duration	Date
1	Kern & Sohn GmbH	Calibration of non-automatic scales	2 hours	January 2051
2	DR. JOHANNES HEIDENHAIN GmbH	Calibration of length gauges	1 h 30 min	January 2051
3	PTW Freiburg GmbH	Calibration services, multiple offering	3 hours	January 2051
4	Testo industrial services Gmb	Calibration services, multiple offering	3 hours	January 2051
5	Inspecta Tarkastus Oy	Calibration of force and length gauges	2 hours	January 2051
6	Schaeffler Technologies AG & Co. KG	Industrial services	2 hours	January 2051
7	Siemens AG	Industrial services	2 hours	January 2051

As seen from Table 5, altogether seven companies were benchmarked which were distributed into the chosen five categories. Five of the companies were competitors, although not local, and two other companies were selected for benchmarking across the field, as operating in different area of services. The categories chosen were service productization level, technical wideness of offering, general visibility on-line, report delivery, and possibility to order or ask for a quote on-line.

Additionally, the previous project was benchmarked to get idea of pits and falls at the case company. It gave a lot valuable information on pass both failures and successes.

F. Validation and Study Results Discussion

The proposal was presented to the case company. It was done in two phases. Firstly it was presented to Vice President and Business manager of the focus department. After their feedback, it was presented to case companies departments service technicians. Details of the interviews are shown in Table 6 below.

Table 6. Study result presentation interviews.

Presentation	Participants	Date
1	Vice President, Business Manager	27.4.2015
2	Department technicians	13.5.2015

The proposal for the new sales process was approved by the case company management in two validation session specified above in Table 6.

2.4 Validity and Reliability Plan

In qualitative research there are two main notion to consider; validity and reliability. Validity relates to the research outcome which should answer the research question set in the start of the research project. (Quinton and Smallbone 2006: 127) To ascertain validity researcher must take certain step. Firstly, data must be accurate. Secondly, interpretation of the data should take into account various perspectives of participants in the project. Thirdly, researcher must scrutinize substitute hypothesis existing in the literature and/or given be relevant research participants in order to avoid bias in his own account. These all combine reassure valid outcome of a research. (Maxwell 1996: 109)

Reliability of the study is derived from the results of the research. Reliability means that if the same research were done by some other researcher, the outcome would be the same, even if it were be done at a different point of time. (LeCompte and Goetz 1982: 32) To strengthen reliability of a study, data should be collected from various data sources, by using different methods, and by following a well-documented researcher procedure. The collected data and literature analysis in this study will follow these validity and reliability requirements.

From the validity point of view, the study would require multiple discussions and interviews with relevant personnel of the case company. This is to ensure that researcher obtains enough information about the case company and its operations and practices related to the study. For example, the business requirements for a sales process altering technical solution need to be collected internally with the help of a study. An analysis of the current operational model, as well as current practices and guidelines, as well as face-to-face interviews and discussions with all the parties involved. Additionally, a feedback from all the key stakeholders, managers and technicians, needs to be taken for the evaluation of the proposition.

To ensure reliability, the main data needs to be assembled from at least three sources. Assembling data from three sources ensures triangulation requirements of the data collection methods. (Dan et al. 2002: 4) These sources may include company documentation, interviews and discussions with relevant participants, benchmarking, and other data collecting methods.

Case study as a research approach requires that to ensure both valid and reliable outcome, theoretical and best practices findings have to be thoroughly analysed in order to ground the proposal. The fulfilment of these requirements will give a good foundation for the proposition.

These requirements were taken into account when planning for the validity and reliability procedures in this study. The following section describes the results of the current state analysis of the case company. It was done with special emphasis to meet the validity and reliability requirements discussed earlier in this section.

3 Current State Analysis

This section discusses the current case company situation, processes and the case department selling, pricing and operating processes.

3.1 VTT Expert Services Ltd.

The case company of this study is a services company VTT Expert Services Ltd. That is a subsidiary of VTT Technical Research Centre of Finland Ltd. It operates mainly in domestic service business, but has some small portion of the business coming from Europe. The company's main services are expert consulting services, testing services, certification services, and calibration services. Previously, VTT Expert Services Ltd. was a part of VTT Technical Research Centre of Finland Ltd, then only VTT, and was taken apart and incorporated in 2009. The whole thought behind incorporating was that all of the services that VTT Expert Services offers are also freely offered and under completion. The idea was that it should not operate under government owned, and partly funded, bureau, but rather go on its own. Currently, the case company operates as part of VTT Group and is a strait subsidiary of VTT Technical Research Centre of Finland Ltd.

VTT Expert Services Ltd has offices in four locations. Espoo is where it has main office, and other locations are Tampere, Jyväskylä, and Oulu. VTT Expert Services has roughly 186 employees including the management that is ten employees strong. In VTT Expert Services Ltd.'s organizational map, there are only three layers. This means that any employee is close to high ranking boss that is a member of management team. The first years of the case company where challenging in both business and organizationally. Know that case company operates its 6th year it is starting to perform better financially and seems to handle processes and organization well. This means also that there is a great deal of eagerness for investing into new service products, and improving current processes.

The idea for this study came from an earlier one that led to the development of service portal at the field of personnel certification. The success that company have had in cost reduction and process efficiency in personnel certification is hoped for when and if study shows that similar simple processes can be adopted to calibration departments services and processes.

3.2 In-Site Calibration of Testing Machines

This section includes plain introduction of the department, its' services and operation model.

3.2.1 Calibration Services

Case department offers calibration services in area of force, length measurement, hardness measurement and toughness. All areas are tight to each other by customers who use these physical attributes in their quality testing and research and development testing. All offered services are accredited by Finnish Accreditation Service FINAS and are offered to all customers. All calibrations, excluding a few exceptions, are performed in customers' location and laboratories. All offered services require a great deal of different measuring instruments and a wide "No-How" of machines, related test standards and different attributes that may affect the final product and/or financial of the product. This requires department employees to have a wide understanding of different attributes that affect the needs of customers and also what drives customers' decision making.

Department has been offering its services since the foundation of VTT in 1942, although the organization in which department operates has changed a multiply times during years. This long history gives department an edge against competition on know-how but has been discussed whether it slows down progress as all calibrations are done the way all has been instead of seeing calibrations end function more clearly and focusing on that.

The solid base for functioning is that all department personnel offer same services but Handel their own designated customers. This means that all communication between customers is done by the same service technician that is providing the physical service. Personal interaction with personal service technician is seen as really good thing among customers as it makes it easier to change its service to either wider or narrower and creates flexibility, or a vision of flexibility, to services when customers can agree directly with the service technician of coming service visits. Customer reviews mentioned in Section 2.3.2 show that the case company is really good in this area and most customers mention the expertise of service personals having a great workmanship and understanding of customers' needs.

Department has 6 employees from which one operates as product manager and one assists as technical responsibility technician. The organization can be seen in Figure 2.

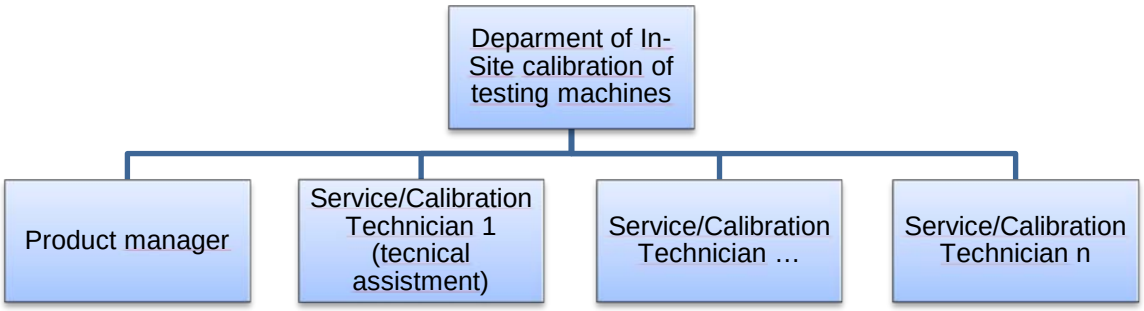


Figure 2. The organizational map of In-Site calibration of testing machines department in VTT Expert Services Ltd.

As seen from the figure above, there is no department manager in place. This is due to VTT Expert Services Ltds' low organizational structure. This has been seen as giving flexibility on developing new services, and lowering costs. The department product manager is responsible for services upkeep, technical capabilities, all employees training, pricing, all marketing, and general customer communication. The nearest personal manager is the Services Manager who organizationally is located right after company CEO.

When offering services it is not always clear what is the whole need of the customer. When calibrating a testing machine designed to produce tension to test subjects there are multiple variables to be considered before a quote can be made. Figure 3 show the variables of a single calibrations for a tension machine.

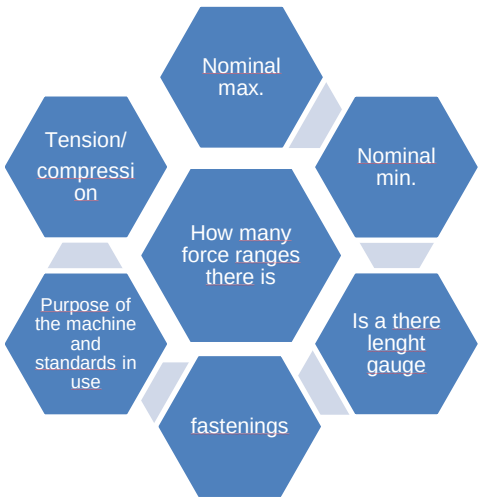


Figure 3. Example of questions to be answered to clarify customers' needs.

As seen from Figure 3, there are as many outputs here as there are machines and uses of the machine. These variables of different calibration configurations make service planning very demanding and more time consuming then it is thought to be. The customer satisfaction also highly depends on service technicians' capability to ask all the right questions before making a final quote. These questions in figure 3 are just examples and final quantity of questions depends on the machine and situation customer is using it and the whole purpose of the machine.

In addition to these services, the case department offers all kind of special measurements that can be made with existing instruments. One example is weighting services that include the definition of geometric centre of weighted piece. These additional services might be important in some years, but in the long term they only cover les then 5% on departments' turnover. More additional services are offered when quoting on calibration of full laboratory equipment.

In addition to tension/compression machine, services include the calibration of callipers and scales. This is something that the department offers free of charge to make quotes more attractive. When considering the free of charge services, they are limited to the calibration services that customers do not necessary need but when done properly are benefiting of. This means that this is one point that VTT Expert Services Ltds' calibration department is trying to differ themselves from competition, and to justify a bit larger quotes.

Since the field of calibration is heavily competed and making profit, it is becoming more difficult over the years. In VTT Expert Services, there is a thought that making a bit more turnover is more important than claiming all the customers having needs. This is true at calibration department also. They try to service the customers that are the most lucrative, but try not to forget the long term effect of customer relations. Customer satisfaction has been one of the constant bonus criteria's in VTT Expert Services, as it is thought that the more satisfied the customers are the more likely they are choosing VTT Expert Services the next time they need similar services. The completion in calibration services is although hard, but mostly focused on a narrower segment and/or area of calibration them VTT Expert Services Ltd is.

According to listings of accredited calibration services in same areas of calibrations than the case company, the case company is offering the widest range of calibration

concerning measured values of force and/or extension. This broadness of offering is seen as an advantage against competition, when competitors with narrower offering cannot take part of all the possible Competitive biddings, but a disadvantage concerning high upkeep costs. This is a conscious decision to offer services to almost all the needs and not narrowing the possible customer pool too much, or to operate an o narrow pool to “scrape the creams off” by lowest prices made possible by lowest costs. This business choice is officially registered in VTT Expert Services and it is written in departments’ business plan.

Thus, the current competitive position is rather good, when even severe economic situation in all of customers it does not affect at too high of a percentage to overthrow whole department out of business.

3.2.2 Pricing Methods

Presently, all services of In-Site calibration department are productized as far as it has seen to be helpful for selling and offering service products. The prizing leans on the smallest part of service that can be performed at calibration that is modification point when making a quote. These parts are called “osatuote” in Finnish and in English it would be translated to “partproduct”. This segmentation enables service technicians, after making all the right questions from customers, to pick all the required partproducts to make a final quote. This kind of service dividing is rather basic part of Productization and is done in almost all products in VTT Expert Services as in calibration department.

In other words, when making a quote, calibration technician asks all the demand related questions from the customer and picks a combination of parts that is always called In-Site calibration on testing machines. Using the same service name for all the customers makes is more clear that the service is always the same in general and that the tailoring done is to satisfy customers need in full. Table 7 presents the list of services for tension machine.

Table 7. The list on partproducts in VTT Expert Services In-Site calibration on testing machines department.

Service Product	Partproduct	Price
In-Site calibration on testing machines	Calibration of force with one transducer	- €
In-Site calibration on testing machines	Calibration of force with two transducer	- €
In-Site calibration on testing machines	Calibration of force with one transducer, additional ranges	- €
In-Site calibration on testing machines	Calibration of force with two transducer, additional ranges	- €
In-Site calibration on testing machines	Calibration of extensometer	- €
In-Site calibration on testing machines	Calibration of extensometer, additional ranges	- €
In-Site calibration on testing machines	Calibration of beam movement	- €

The services presented in Table 7 are not self-explanatory but need service technicians' know-how to use them; nevertheless they give a glimpse of the system in use.

This kind of pricing method allows both tailored quotes to be made with quite easily and the reporting of different parts that may require different resources to be identified. This is the only method used in standard services where customer, even though thinks he/she has individual needs, can be serviced with standard parts of service with standard processes. For customers that actually have so individual needs that they cannot be services with standard processes there is a process to calculate the final quote that still uses standard partproducts, but then the partproducts are more like hours of work and recourse needed. This includes the price for instruments in use and hourly prices for different parts of work.

3.2.3 Productization

Services that cover more than 95% on annual turnover have been productized to a form that pricing and processes allow. VTT Expert Services Department of In-Site calibration of testing machines has a own process for productization when planning new service products. There steps that make sure that service is possible to offer to customers according to their needs and with competitive pricing. First step when a decision of a product development has been made is to recognize different parts of a technical process. Then these parts are divided to parts that are always the same and parts that will need tailoring according to customer needs.

Second step is to recognize costs of different parts. These costs are then put to parts price. These parts are the called Osatuote, as explained in pricing methods, and are presented to service technicians. This is a simplified process of productization in VTT Expert Services Ltds' In-Site Calibration of Testing Machines department.

3.2.4 Sales Process

VTT Expert Services department of In-Site Calibration of Testing Machines has no down written sales process. All sales are done by individual service technicians who have assigned the responsibility of a certain customer. This serves two goals that are wanted to be the advantages when making purchases with VTT Expert Services. Firstly communicating with the same technician that comes and performs the calibration gives customers a feeling of receiving a tailored not so standard service, even this is impossible due to really strict processes guided by national technical standards.

Secondly it gives the said service technician room to plan his/her self-calendar to personal liking. This has been a point of employee satisfaction that has been thanked yearly in employee satisfaction inquiries. When an employee has more power of his/her doings, they have been even more productive than employees in departments that do not offer this advantage to department employees.

Basic sales process starts with a signal from customer system that next calibration service is due. This system is necessarily not an official system, or an IT-System. Then the service technician contacts customer according to customers stored technic of communication. That may be E-Mail, a call, a text message, or any other form of com-

munication. During this contact service technician asks all the important questions to be able to make a quote, and then proceeds to form it in VTT Expert Services Ltds' ERP-System.

During the communication usually technician must obtain four basic pieces of information. First piece of information needed is that does the customer still operate the testing machine, or machines, the same way they operated prior to last calibration. This allows the technician to know whether the need still is the same and includes the same part products. Second piece of information is that are there any changes in physical ranges to be calibrated. Even customer still uses the machine, or machines, the same way there may be a new product that has physical properties that go out of prior calibrated range.

Third piece of information is the timeline where machine has to be calibrated and what is the timeline where customer wants it to be calibrated and is there any moving ground there. This is also important; cause even though the next calibration almost always happens at roughly the same date as the previous one there might be other reasons why it should be done earlier or later. Fourth information is that is the order going thought formal bidding contest or does the customer just need a quote.

Combining all these pieces of information the service technician can make a quote that should satisfy customers' needs. These pieces also give an opportunity to dig into possible other machines that require calibration, and is the customer interested of buying calibration for them from VTT Expert Services Ltd. This is a notable effort to increase turnover by gaining more revenue per invoice. This is one of the things VTT Expert Services Ltd sees important and is pointed as one of bonus defining aspects.

3.2.5 Reporting

After the calibration follows the last phase of actual service, reporting. All calibrations have to be presented to customer by official calibration certificate. The certificate varies depending on what were the machine and calibration performed and all of the customer information's inquired before the calibration. Standards which by the calibrations are performed dictate strictly what certificates must include and what they can include. Other source of demands is from Finnish accreditation service FINAs during auditing. The accreditation body inspects and approves all used certificates under accreditation and makes demands on them.

Final report is the actual physical proof of calibration that customers can use in their own operations when trying to market their products or to convince their own customers of their quality assurance systems, or to inspectors inspecting quality standards. Report also allows invoicing to be made. In the report service technician puts all made work, possible classifications, and used instruments. This report or reports are then send to customer in paper. All reports must be signed by least the service technician him/herself, or in by some cases also by an employee positioned higher in organizational chart. All reports must be printed in consistently the same colour and form. This takes a lot of time, and is location bound. It cannot be done in the road, or in the hotel. Since invoicing is so tightly bound to reporting it is seen as an obstacle to tackle.

3.2.6 Invoicing

After the calibration service has been delivered and the report has been written, signed and sent to the customer, service technician makes summary of all the performed services and a summary of traveling expenses. These summaries with the signed order will be then sent to company secretary who composes an invoice from the company ERP-System and sends it to the customer. Invoicing is done the last, and is the Achilles heel at the department. The invoicing delay can go up to 10-15% of annual revenue, and is sometimes hurting the result. The sooner performed services can be turned in to money the better. This is one of the reasons of this project.

3.2.7 Future Needs form Legislation and Standards

Future is always hard to predict, but from legislation and standardization point of view it is really easy to see 2-5 years ahead. All legislation comes through the whole process of hearings and open preparations. This gives us a good head start what is about to come, but this is true concerning our competition also. So having a clear view of legislation does not give you an advantage but having not is a disadvantage. Standardization is initially prepared and done in International Organization for Standardization ISO. These ISO standards are the distributed around the different national standardization bodies. In Finland the national body is Suomen Standardisoimisliitto SFS ry that abbreviates its' name SFS. These bodies control the upcoming standards and their timetable.

VTT Expert Services Ltd has an employee positioned in SFS's group that controls the standards that calibration department abides. He has access to all project phase standards in ISO and a right to make Adjustment proposals to them. This gives a certain competitive advantage, although anybody can apply for this position the competition has decided not to. It is a large cost, but seen as important due the possibility to earlier preparations for future changes.

One recognized need for future is to turn VTT Expert Services Ltd to paperless office. This is achieved by developing service methods such as proposing in this very Thesis. The distribution and handling of all the documents that are possible by way of an automated computer program and/or interface gives VTT Expert Services a possibility to getting closer to the target of paperless office.

3.2.8 Customer Reviews

The case company gather customer feedbacks in a regular process. Once a service has been invoiced, financial secretary send a customer feedback questionnaire to the customer. Customers do not have any compulsion on answering to these questionnaires, but they are an important channel to communicate that process has some development issues to answer for.

General response rate concerning services produced by calibration department is around 30%. The answers paint a picture of extremely satisfied customers. The mean for questions of service satisfaction is 6.4, when the numeral range is from one to seven. The Net Promoter Score (NPS) has been between +42 and +66 since it was taken to use. NPS was only taken to use in the beginning of 2014, so it does not yet give accurate results but more like Indicative results. But be indicative or not, having a NPS value of over +50 is excellent.

Most interesting point on customer reviews was open questions. The questionnaire sent to customers includes a couple of open questions for customers to answer. These answers included mostly more applause to the technician, or complaint about price. But however there were numeral answers requesting a more easily used process of defining and following calibration intervals. This was said in least 20 to even 50 percent of answers containing written answer.

3.3 Key Findings from the Current State Analysis (Data Collection 1)

The findings from the current state of the sales process and service operations revealed many interesting things. Firstly, the calibration departments' sales process is not defined in detail. In addition, there is no system to facilitate the first sales communication or regular visits to customers, nor there is any system to support communication other than e-mail. The only system that the case company has is ERP. Since this study does not focus on ERP, it is not subjected to scrutiny. The department has functioned years with no defined sales process and that has led process development to each technicians personal hands. Practical development over the years has made the sales practices quite varied to each other when comparing the employees to other employee.

The second finding is that the case company department that this study concerns has a high level of productization and a simple pricing method. Both of these are important if the services are to be offered in internet so that customers could get a strait price for their desired services. The more difficult the pricing is, and the more tailoring the service requires, the harder it is to fit them into an internet based offering and catalogue.

The third finding is that the reports which are written and then sent to customers require physical presence of least one, and in some cases, two representatives of the case company. This means that after the services has been delivered, it now has to be reported to the customer through physical presence, which does not support financial target approach. Having a system that would allow results and certificate distribution and signing documents digitally would enable a more rapid reporting, less expenses, and will also reduce invoicing delays.

Fourth, it was found that there is eagerness in the management team to develop the sales processes by offering support systems to the employees that would make routine parts of work so easy that the employees could concentrate on the difficult parts more. Even eager, the whole management team sees that the development should and will be done carefully to ensure valid and reliable outcomes.

Fifth, there is a need for the system that would involve the customers as well. What customers need is system that would support their functions as manufacturing companies that test their own products and therefore have to upkeep calibrations to their test-

ing machines. There are a lot of available systems offered, but mostly they are quite expensive for a single company that only has one testing laboratory with one or maybe two testing machines. This need is important when making decision about investing into the case company support systems.

Sixth, since predictability of the demand for calibration is quite high, the case company has a clear view of the future. One possible approach to predict the upcoming changes in operating environment is to follow the standards and regulatory acts all the time, which are tightening their approach to written reports and results distribution, and tend to require more environmentally-friendly direction. Otherwise, the general development of requirements in standards happens little by little. Presently, since these standards give many advise on both quality and regulations for calibration laboratories, such a system maybe the most significant response to these tightening requirements. Therefore, it is the right time to start developing a system that incorporates or enables these functions right now rather than later.

Seventh, similar systems are not in use in any other company competing in the same area of services. This would give VTT Expert Services the edge of being the first in its industry, and a possibility to increase revenue by consulting the companies that do not operate in the same geographical business area. The only systems that were identified are those that are used for simpler services, with little variation in them, and are always conducted in the provider's facilities.

The eight, and final, finding is that even though calibration department has excellent customer feedback data, the customers are starting to demand both easier and better service integration to their own systems, as well as demand the whole system from their service subcontractor. This has to be taken seriously so that is has to be recognized as yet another main reason to start developing own systems to offer more. Competition is very tight already and it will get harder; therefore, being able to compete in more ways than just the price is the only point to ensure survival. Table 8 summarizes the findings from the current state analysis.

Table 8. Findings from the current state analysis.

No	Finding/Challenge	Description/ Consequence
	Findings related to process	
1	No well-defined sales process	Each actor works according to individual procedures (no standardised process)
2	High level of productization and simple pricing	This support an easy system. Service products are easy to import to other systems when they are productized well, and the pricing is simple
3	Result reporting takes time and is felt to be too much location bound	Interactive systems are capable of having reporting functions that supports resource usage
	Findings related to management support	
4	Eagerness to development from management	New developments projects are easy to start and get funded
	Findings related to customer relationship and competitive position	
5	Customers have expressed wishes for service development	This means that any new thing will have fewer opposition when change is already a wishes thing
6	Future predictions support chosen development	This change is still to come in standards and guidelines, but when it does come it is better to be ahead rather than behind on meeting demands
7	Case company would be the first one to offer such service	Being first would give the case company a lead when developing services and would cause loyalty among customers
8	Customers have expressed wishes for better system integration	This may be too much to ask for, but it is possible to include import and export features but actual integration would bound too much to one technical solution that is too expensive

The findings presented in Table 8 show that there it is clear demands for development of the current sales process from many point of views: from the stakeholders, customers, competition, regulation, etc., and that direction for development is quite clear.The current state analysis was done so that all the requirements of validity and reliability would be fulfilled. The whole process was done as meticulously as possible, with registering and reporting from the data and following a non-biased approach; the case company expressed satisfaction with the quality of this research process and the findings from it (discussed later in Data 3). These findings also pointed to the directions for search in best practice and literature and suggestions to build an improvement proposal for the case department (Data 2).

4 Background Knowledge of Calibration as Service

This section discusses the existing knowledge related to calibration as a specific area in services. First, the researcher demonstrates the legislative requirements and other reasons for calibrations. Secondly, the researcher shows the business process requirement for this service such as ISO standards and competences from the calibrating laboratories. This information is necessity to present before discussing how to make improvements to the business process of the current calibration as a service.

4.1 Calibration as a Service and Its Requirements

Calibration being a service, the need and requirements for it are set rather strictly and explained below to open up why customers should calibrate their machines in regular intervals, and what makes the requirements and environment for this service.

The formal definition of calibration by the International Bureau of Weights and Measures is the following:

> *"Operation that, under specified conditions, in a first step, establishes a relation between the quantity values with measurement uncertainties provided by measurement standards and corresponding indications with associated measurement uncertainties (of the calibrated instrument or secondary standard) and, in a second step, uses this information to establish a relation for obtaining a measurement result from an indication." (Joint Committee for Guides in Metrology 2008: 28)*

Calibration that the case company (VTT Expert Services calibration department) offers is the force calibration according to standard SFS-EN ISO 7500-1 and according to standard SFS-EN 12390-4. These standards demand a calibration interval of maximum of 12 moths. This, however, makes only one calibration standards requirement. The quality standard or other directives add a lot of other regulations and requirements on top of this.

ISO 9001 defines calibration as a set of operations required to ensure that measuring equipment conforms to the requirements for its intended use. Advanced Instruments, Inc. defines it as a comparison between measurements – one of known magnitude or

correctness made or a set with one device and another measurement made in as similar a way as possible with a second device. (ISO 9000 2005: 45)

Specific requirements for calibration as service are described in more detail below.

4.2 Reliability of Test Results

Reliability is one of the most important elements of test quality. There are certain characterical features that are linked to the concept of reliability in testing. These features are consistency, and reproducibility. This means for example that a test for on attribute of tensile strength is not dependable to the factor of time or place, but gives same results if executed in the same manner a year later. (Professional Testing Inc. 2006) There are many factors that contribute to reliability in product testing. These factors are for example human factors, accommodation and environmental factors, test and calibration methods, method validation, equipment, measurement traceability, sampling and the handling of test items. To which extent these all contribute to the uncertainty of a test result differs between types of test and/or calibrations. (SFS-EN ISO/IEC 17025 2005: 31)

4.3 CE-mark on Building Parts

The CE mark is a mandatory conformity marking for certain products sold within the European Economic Area (EEA). The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives. CE marking signifies that the product conforms with all EU directives or EU regulations that apply to it. There may be many different directives and regulations that a product may have to conform. (The Directorate-General (DG) for Internal Market, Industry, Entrepreneurship and SMEs 2015)

European regulation dictates that all building parts must be approved in a notified body before they can be marketed in EE-area. This means that they have to conform to the standards and directives. One point is that EU-directives require that all manufactures test their product and have a calibrated testing machine in their laboratory. (The Directorate-General (DG) for Internal Market, Industry, Entrepreneurship and SMEs 2015)

4.4 Requirements for Structural Design and Verification

In addition to the type of construction and the method of construction there are multiple variables that designers have to take account when designing products, product parts, and/or whole structures. Some of these are action of forces that influence the structure, what kinds of effect does said force have, are there any variable action that alter in the course on time, seismic actions, geotechnical actions, free and fixed actions of force, and both dynamic and static actions. All these have to be able to proof by a set of documents, one which is declaration on conformity. (SFS-EN 1990 2006: 33-39)

A basic requirement for any part of the design is to sustain all actions and influences likely to occur for a structure or a structural element. A structure shall be designed to have adequate structural resistance to actions but also serviceability and durability to its designed lifetime. The reliability required for structures is achieved by quality management measures. When making a design there are assumptions made. These assumptions concern the actions that affect the structure. These assumptions create requirements to the structure. In order to reliable confirm that structure meets these requirements and appropriate quality management system has to in place and it has to contain a metrological measurement part to confirm that physical attributes are as designed. (SFS-EN 1990 2006: 45-51)

4.5 ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories

The main reason for having an own standard from which to operate according to is that testing and calibration results between countries should be fully facilitated if laboratories comply with ISO 17025. In addition calibration laboratories are expected to acquire accreditation themselves from national body of accreditation. This reason is although a current one and has started from the growth of management systems in general. The need for an own standard is also due the fact that both testing and calibration differs from the conventional industrial services in regard of precision and conformity requirement. Those requirements of ISO 9001 that are relevant to the scope of testing and calibration services covered by the laboratory's management system are included also in ISO 17025. Testing and calibration laboratories that comply with ISO 17025 International Standard will therefore also operate in accordance with ISO 9001. (SFS-EN ISO/IEC 17025 2005: 11)

When applying to ISO 17025 there are some changes when comparing to conventional service organization. First differences are in the management system. It requires that the laboratory itself is an entity that holds legal responsibility. Also it requires that the whole responsibility of the laboratory to carry out its testing and calibration activities. Then the laboratory has identify and upkeep a list of potential conflicts of interest. This is to prove independence to ensure test- and calibration results. It is also needs to have managerial and technical personnel who have the authority and recourses needed to carry out their duties, including duties implementing managerial systems. (SFS-EN ISO/IEC 17025 2005: 15)

As mentioned before, ISO 17025 contains the requirements of ISO 9001 but is has much more into detail requirements of the whole operations. It includes a written requirement of management system, document control, document changes, document issuing and approving, review of requests, tenders and contracts, subcontracting, purchasing, service to the customer, handling complaints, control of nonconforming testing and/or calibration work, corrective action, cause analysis, selection and implementation of corrective actions, monitoring of corrective actions, and technical records for a short example. (SFS-EN ISO/IEC 17025 2005: 15)

4.6 Summary

To summarise, calibration services are mandatory services for most manufacturing, importing, and selling organizations that test their own products must upkeep the calibration of said testing machine in order to fulfil the requirements for test result reliability and quality standards. Customer segment that is required to test their products includes all organizations that sell, install, manufacture or import products that are mentioned in CE-mark law acts. They are required to test their products and thus to prove test result reliability by calibration.

In order to sell and perform calibration tasks, case company have to have its services accredited. This means that requirements are more deeply infiltrated in to departments processes. Thus the process must oblige to requirements from quality standards, measurements standards, and specific calibration standards, that all influence on the way selling can and have to be operated.

Both these set of requirements to either customers but also to case company itself impose certain aspects to process design and thus affect the proposition.

5 Best practice of Business Process Management

This section overviews the features of services and explores the existing best practice in business process management which is relevant to improving the business process of sales.

5.1 Services and Service Offering

Based on the current perspectives gained from the literature, there are four distinctive characteristics that makes service a service. Firstly, they are intangible. Service is always more of an action than an object that could be used in any physical way. Secondly, they are heterogeneous. It means that their quality is not constant but more like constantly changing due to service being delivered by people to people. Thirdly, they show simultaneity of production and consumption. Service products, or services, are normally both produced and consumed at the same time and neither one of these, production or consumption, can be detached from each other. Services can only be produced at the time on consumption. Fourthly, they are perishable. With simultaneity comes the fact that they cannot be stored or put aside for later consumption. Neither they can be returned or sold forward. (Aurich et al. 2010: 136-137)

Services lice-cycle, as a single service, consists only of two phases. These phases are service design and realization. This life cycle is also called production. This means that the realization phase is the phase where interaction with the customer happens, were service design phase happens before that. The design phase includes planning, conception, and preparation for realization phase. In this contest planning has a different meaning to service offering planning, which is in this contest called service engineering. Service planning includes identification, definition and selection of service ideas. Conception includes determination of different service components in detail and the needed qualifications of service technicians. Preparation may also include recourse definition, as in definition of service technicians, but not necessarily. Necessarily it does include the preparations of service production, may this mean location preparations or anything else, and preparation for interaction with the customer. The result of service design phase is seen as the willingness and capability to produce the service required by customers. (Aurich et al. 2010: 137)

Development in the industrial business area is that services are becoming ever more important for organizations to master in order to survive in competitive environment of today. Additionally service products have a shorter life span and a requirement of more rapid innovative regeneration of services. This means that if a service organization does not come up with something new annually, they face a risk of slowly estranging customers. This however does not concern all businesses and management has to be careful not to be too innovative, ahead of their time as the saying goes. Constant innovation is also one way of differentiating yourself from competition. Services are offered all around the world and now days even long distances are easily overcomed. Innovation in services also has the potential to enable flexibly individualizing and higher customer loyalty that both lead to higher profit margins. (Aurich et al. 2010: 137)

5.2 Value Creation and Co-Creation in Services

The concept of value and its creation makes services strikingly different from products. In physical products, value is an easier concept. The main difference with services is that customers are always co-creators of value. This concept of co-creation is based on a notion that customer is the one who experiences value, and value is created in use. This value-in-use concept is one of the first concepts that try to clarify the concept of value and value creation in services. (Grönroos & Ravald 2011)

Value Co-Creation firstly raised when in marketing practitioners started to talk about S-D logic, or Service-Dominant logic of operating organizations. In C-D Logic, the customer is put as co-creator of value, in oppose to G-D logics co-producer of goods. Value-In-Use concept states that value for customers is created during consumption of products and services. If value is co-created, it takes place in an interactive usage of resources where the customer is the resources' user and the provider simply puts resources in place where they are open to use. In other words, providers could be called resource facilitators or integrators. Value thus depends on the customers' ability to use services or products to him/her benefit. (Grönroos & Ravald 2011)

A joint value creation seems to be happening in customer interaction (Grönroos & Voima 2013), the interaction where, even though customers are the main subject, it is carried on together. In and during this interaction, the provider can reconfigurate his role to a value facilitator. During the interaction, the provider can strongly influence the customer's experience and therefore become a co-creator of value. In addition, if you look

interaction in the providers' point of view, it offers a great opportunity to enter and contribute to co-creation. This opportunity gives providers even more reason to arrange the interaction platform by themselves so that they have more choices on influence on the content of interaction. (Grönroos & Ravald 2011) It has to noted that even though both participants are creating value during interaction, it is only during interactions that providers can be co-creators of value, and without interaction the only creator is the customer.

5.3 Service Design and Service Systems

In services, designing a service it also is often referred as service engineering. The term separates it from the design phase of a single service. Service engineering is the same as in physical products. There are requirements that need to fulfil and there is a marketplace for offering said service. Definition of Service engineering is simply all action to define, and plan the resources, pricing, and other aspects of a service. Other aspects may be offering logic, location, productization, and technical specifications. To summarize, service engineering aim is to intensifying, improving, and developing the whole service framework. (Aurich et al. 2010: 137)

One way of approaching service design is through Product-Service systems. The goal of a Product-Service system is to regulate consumption by offering alternative ways of use simultaneously to increasing recourse productivity and dematerialization. Product-Service system can be defined by integrated product and services function that delivers value-in-use. Other definition is that product being a physical or tangible component that provides technical or mechanical function to the customer, service part is to offer product insurance, product usability enhancements, and product availability to the customer. (Aurich et al. 2010: 139-140)

Product-Service systems are a case where services as related to technical products. This raises the requirement of establishing relationships between the technical product data and the blueprints. Service blueprint is built around the main stages of the service. These stages are the key process steps as seen by the customer. Every step has its own unique service standard and guidelines which are tightly related to required level of performance of the service. (Kundu et al. 2007: 167-169)

Product-Service systems are a natural next step to rise of S-D logic in the field on marketing. S-D logic has its foundation in the idea that a service would bring competitive advantages. Before this new logic, service was considered as type of product. Currently it is seen as the main offering, and not a by-product for marketing physical products. In S-D logic services are considered in higher hierarchy the physical products. Additionally, customers are seen as a resource, collaborative partner, or a co-creator. In S-D logic, price is replaced with value proposition created by both sides. (Lusch et al. 2007: 6-10)

Summing up, these views are also applicable to calibration as a service. This is a service that the customers use long after interacting with the company, and the interaction can lead to better utilization of services, as well as may influence the customer to consume even more calibrations services. Finally, calibration makes the service which is built around the technical products. Therefore, the systems to facilitate and structure the consumption are also highly relevant to the calibration service. Next, the principles of business process management are discussed so that effective improvement can be suggested to business processes.

5.4 Concept of Business Process Management

In a general sense, business process management (BPM) is the art of defining processes. It is a structured approach to analysing and improving business activities. Activities that BPM focuses on improving are the key elements of business, marketing, communication, sales, and of course invoicing. Business process can be defined as a set of functions in time that have definable inputs, a logical linear order of operations, clearly defined tasks, and a predictable or desired outcome. (Zairi 1997: 64)

Zairi (1997) suggests seven rules that business process management is governed by. The first rule is that all major activities have to be properly mapped. The second rule is creating customers focus through horizontal linkages between key activities. Thirdly, it relies on well documented procedures to ensure discipline, consistency, and repeatability of quality performance. Fourthly, all activities have to be measured to assess the performance of each individual process, set targets, and outputs which can meet the corporate objectives. The fifth point is to ground process management in continuous approach of optimization through problem solving and gaining extra benefits. Sixth rule is to be inspired by best practices to ensure competitiveness. Lastly, it is an approach

for cultural change and does not result simply through having good systems and the right structures in place. (Zairi 1997; 65)

Business process management is not only management of processes. It is also about moving from a functional organization to a process-based one. It makes process guidance and ownership possible. The goal is that managers are responsible of processes, not of departments. Process management is also more about the team than the individual. This approach may feel frightening to some, but it is a way to better efficiency of functions and lower costs. The key to success is to know your processes and define them well. (Armistead 1996)

5.4.1 Guidelines for Business Process Modelling

Different management systems such as lean management, activity-based costing, total quality management, business process re-engineering, process innovation, workflow management and supply chain management have two main attributes to business process modelling and model requirements. (Van der Aalst et al. 2000; 30–31)

First, the variety and number of both the users of models and the model designers has spread vastly. Especially, users and designers from various departments that have different bases such as technical departments and financial departments who necessarily are not experts on modelling are involved in business process modelling and design. Consequences of business process modelling becoming more common is the growing importance of understandability of process models. (Van der Aalst et al. 2000; 30–31)

Secondly, the quantity and variety of different purposes for process models is growing. In addition to traditional uses within software engineering these models are more and more used for organizational purposes like process reorganization or human resource planning. (Van der Aalst et al. 2000; 30–31)

While process modelling is supposed to be an instrument, a tool, for coping with the complexity of process planning and control, existing models show as well considerable complexity within themselves. For this reason the design of process models often turns out to be problematic. The complexity has direct influences on the economic efficiency of the process related project. Firstly, the model design requires personnel resources

and may require the purchase of software tool or tools. Secondly, there is a risk that the process model, referring to their purpose, is not sufficient. The possible mistakes are either semantic mistakes or the mistake of disregarding of relevant aspect. Both mistakes can lead to possibly expensive misjudgement. For these reason, the design of models is always an economical risk and should not be taken as only a modelling exercise. (Van der Aalst et al. 2000; 30–31)

Aim of modelling guidelines is the specific design recommendations in order to increase the quality of process models. The term used is GoM, and is has been chosen as an analogy to the Generally Accepted Accounting Principles. Firstly, GoM results form a selection of relevant aspects for information modelling. Secondly, it adapts elements from the existing approaches for the evaluation of information models. The Guidelines of Modelling contain six guidelines to ameliorate the quality on process models. These guidelines are the principle of correctness, relevance, economic efficiency, clarity, comparability, and systematic design.

According to Van der Aalst et al. (2000), the principles for what?? fall down into two categories. The first category is the principles that are necessary preconditions for the quality of a model. The first category includes the principle of correctness relevance and economic efficiency. The second category is the principles that have an optional character. The second category includes the principles of clarity, comparability and systematic design. The GoM-framework includes in addition to the six general guidelines (level 1) the recommendations for different views (level 2) and for different modelling techniques (level 3). (Van der Aalst et al. 2000; 30–32) The guidelines are illustrated in Figure 4.

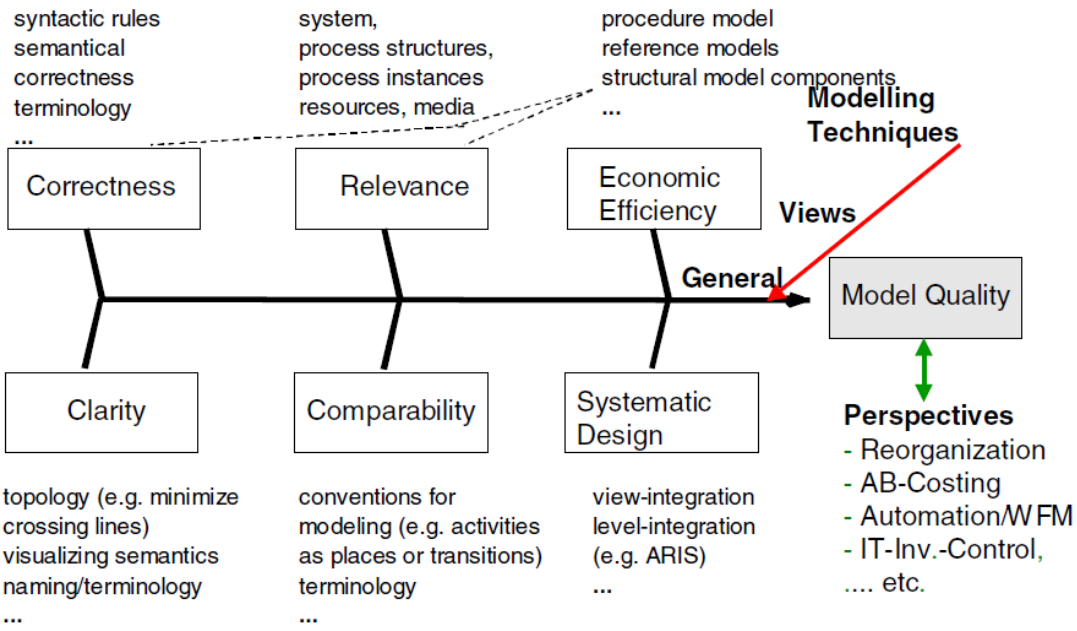


Figure 4. The framework of the guidelines for process modelling. (Van der Aalst et al. 2000: 32).

As seen from Figure 4, the guideline for correctness has two sides to it, the syntactic and the semantic sides. A model is syntactic correct, if it is consistent and complete against the meta-model the model is based on. A model is semantically correct if the structure and the behaviour of the model is consistent with the real world. The guideline of relevance includes criteria that the model is compared against to determine relevance. The criterion is that all elements of the model ought to be relevant to the model user. Relevance means that an element can be taken out of the model without loss of meaning to the model user. The Economic efficiency guideline is a constraint to all other guidelines. Economic efficiency is comparable to the term feasibility and it restricts the correctness or the clarity of a model. Economic efficiency is supported by reference models, appropriate tools, and/or the re-use of models. (Van der Aalst et al. 2000; 30–32)

The guideline of clarity consists with the notion that without a readable, understandable and useful model all other efforts become obsolete. The guideline of clarity is really subjective and supposes that the model is understood completely by the model user. The guideline of comparability demands that all guidelines that are used are used consistently throughout the modelling project. This guideline corresponds with the comparability principle in GAAP. The comparability principle includes a demand to have all naming and layouting agreed in a joint convention. The guideline of systematic design

assumes well-defined relationships between models that belong to different view, for example information and data views. (Van der Aalst et al. 2000; 30–32)

5.4.2 Modelling Processes by Business Rules

The approach of modelling processes and workflows by business rules is an approach that provides a uniform modelling approach at different abstraction levels. Modelling by rules is to transform a rule-based description of a business process such as sales or invoicing into a rule based workflow specification. The rules are initially described in natural language. (Van der Aalst et al. 2000; 16) In subsequent steps the rules are refined in a structured manner. This results in a set of rules that represent business processes in different abstraction levels.

Rules have two kinds of relationships towards each other. First is the relationship at the same abstraction level. This establishes the control flow between the components that are defined in the same level. Second relationship is a hierarchical relationship between the higher level rules and the lower level rules. The process of modelling always consist the same rules and the same basic construction, which might be changed or altered depending on the level of abstraction. (Van der Aalst et al. 2000; 17)

The modelling by business rules serves as an integration platform for different process modelling techniques and different target systems that implement the workflow or parts of them. The representation of the rules bases on definition of events, conditions, actions, and the selection construct. The resulting construct is enhanced with different constructs that represent static components of business process, for example organizational units or actors. (Van der Aalst et al. 2000; 17)

Organizations contain a lot of knowledge and many of the existing rules to prescribe and/or restrict the way in which goals are achieved. Some of these rules exist in formal manner, in a company handbook for example. Others are not documented and exist only informally. Some of the formal rules are so precisely defined that they can be automated in the company systems others allow the decision of a human nature. Business rules were originally defined in connection with constraints resulting from the cardinalities of entity-relationships. (Van der Aalst et al. 2000; 17-18)

Business rules do not cover data integrity but usually restrict organizational behaviour. Business rules can be defined as a statement about how the business is done in respect to states and processes in an organization. (Van der Aalst et al. 2000; 18) ‘

To summarize, business processes and guidelines are as important to take into account when designing new processes so that the process would full fill requirements for organizational success to meet the business goals set by the management of the company.

5.5 Workflow Management

Workflow management and workflow-based applications are the primary target for economic efficient development. It requires a well-constructed planning and implementation system, and additionally demands an efficient design of workflow models. At their best, workflow models function as communication platform for those who work on the project in all project stages. Workflow management systems all have their own distinct modelling technique. This implies that when a certain management system is chosen for the organization, the modelling technique has to change too. (Van der Aalst et al. 2000; 35–42)

The existing knowledge implies that the number of business process models transformed into workflow models is rather small. It is usual that within used 100 or more business process models only two or three may be used for workflow modelling. In Addition, only a part of business process models can be controlled workflow-based. Thus, to gain economic efficiency manual revision of workflow models is often used rather than use of interfaces. The interfaces do provide some syntactical translation, but do not breach the gap between business process models and workflow models. (Van der Aalst et al. 2000; 35–42)

Workflow models include a lot on actions, or functions that a required to reach certain targets set by the organization. All activities have at least a weak relationship to business processes and thus business process models and workflow models have certain relationship. Workflow models usually include a lot of manual functions; this is due to their characteristics. This is noted to be avoided, but some workflows depend on them so according to principle of relevance from chapter 5.5.2 all the functions that are relevant or even mandatory have to be included in the model. In addition the amount of

functions rises simultaneously to the amount of organizational units and systems involved within the modelled workflow. (Van der Aalst et al. 2000; 35–42)

Generally it can be stated that granularity of the functions in workflow model is determined by change in organizational unit and/or system. Figure 5 presents a system on how changes of involvement of organizational units and/or application system a new function has to be introduced. In addition the workflow management systems generally do not accept function reuse so a redundant function specification is mandatory. (Van der Aalst et al. 2000; 35–42) Figure 5 shows how new organizational parts, apartments, are taken into account when designing processes.

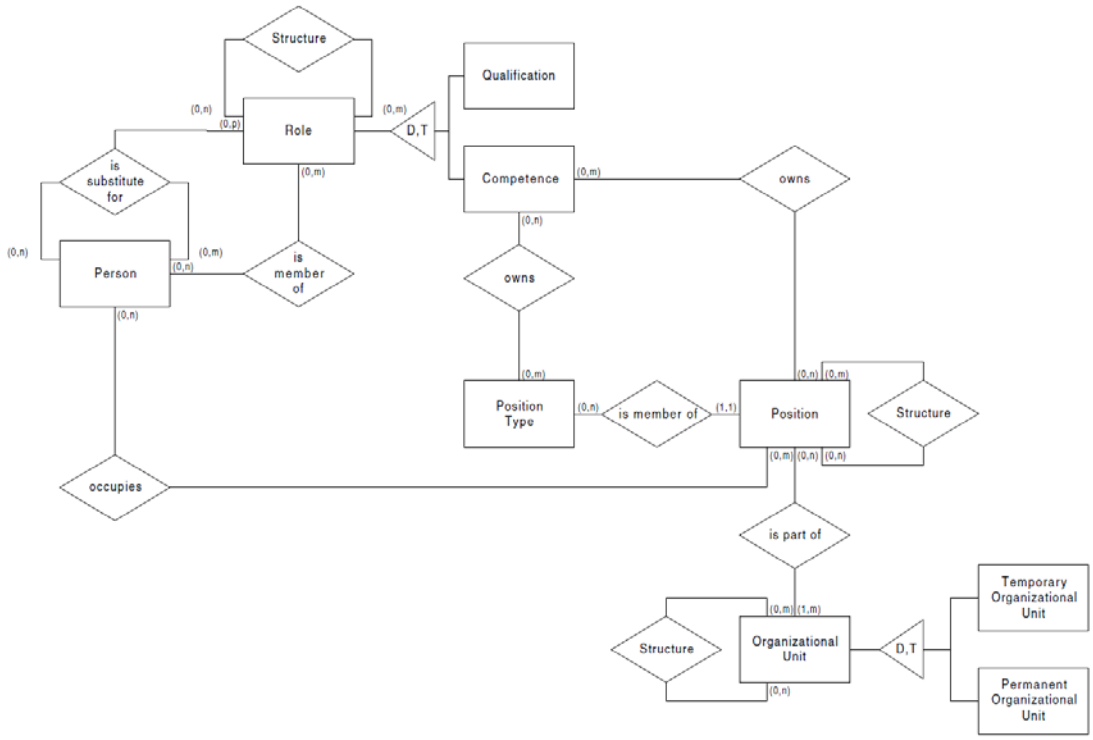


Figure 5. A reference model for the organizational constructs within workflow models (Van der Aalst et al. 2000; 37).

As seen from Figure 5, organizational units have a lot of common to participants inside the units. Thus the same principle can be used to design processes in units own premises where every participant has a certain know-how and certain attributes to give.

The basic rule is that every function has to have start and end conditions precisely determined. In addition, starting options is also important, whether the function starts au-

tomatically after the previous or requires a manual start. Optionally deadlines for every function can be declared. Exceeding the deadline can be determined as a signalling point to higher authority, process owner or higher management in organization. (Van der Aalst et al. 2000; 35–42)

For the design of a functional executable model all attributes of all functions have to be specified. A workflow model, unlike a pure business process model, requires the description of the mandatory input and output data to be described. The rule is that only critical data is specified in the first round of modelling. The next phase is to complete the data view with information of the data type used in the function and the data location. Data location might be databases of the organization or product datasheet for example. Additionally to data being specified, the data flow have to be described. Within dataflow description it is determined the function that produces the data to the function that uses the data. (Van der Aalst et al. 2000; 35–42)

To summarize the business process management is to think why and what aspects of it should the proposition include and what should be taken into account. The first is that the principles of process management have to reflect to the final proposition. The idea is that the process design and modelling is done also to make future developments possible.

The second is the guidelines of business rules. The sales process is a prime example of a process guided by business rules and thus should be designing accordingly. Sales process applies well into workflow management, the idea of including capabilities and other aspects into a process are vital for a successful design.

5.6 Conceptual Framework for This Thesis

In this study, the main elements for new sales process to facilitate selling, offering and final delivery processes have been identified and discussed with the case company's service technicians, business managers, and Vice-President of customer service operations reflected in Section 3, Current State Analysis. Based on the findings from existing knowledge and best practice the identified elements of the process, are summarized into the conceptual framework intended for the creation of the proposal for the case company. The conceptual framework (see Figure 6) of this study is built around

the functions and their described data needs and data outcomes to suite standard services and the service types. Figure 6 shows the conceptual framework in this study.

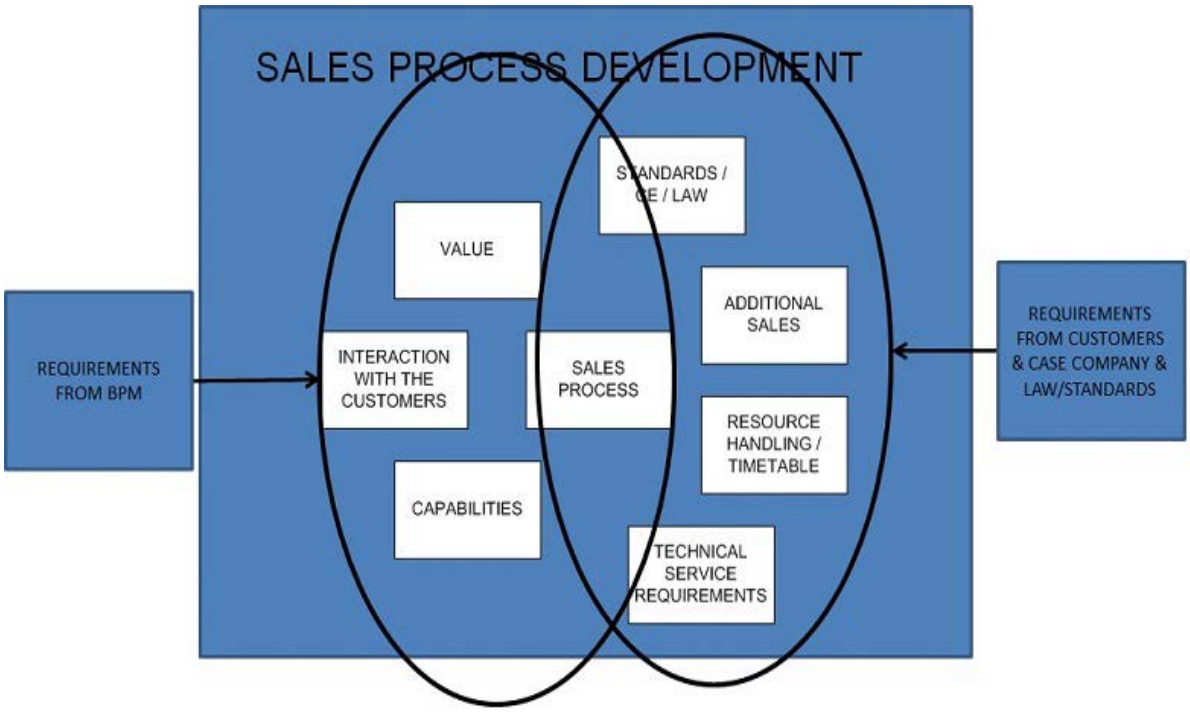


Figure 6. The conceptual framework in this study.

As seen from Figure 6, the conceptual framework of this study combines a number of core topics indicated in boxes. Each one of these boxes represents a requirement or a feature that a sales process should either include or satisfy. These requirements come both from the existing literature and the current state analysis.

6 Building a Proposal for the Case Company

This section builds the proposal for the case company by merging the results of the current state analysis and the conceptual framework and further developing them based on stakeholder discussions.

6.1 Overview of Findings of Data Collections 1 and 2

The first round of findings came from Data collection 1 from the current state analysis.

Table 9. Findings from the current state analysis.

Strong / weak	Finding/Challenge	Description/ Consequence
	Findings related to *the sales process*	
-	No well-defined sales process	Each actor works according to individual procedures (no standardised process)
+	High level of productization and simple pricing methods	This support an easy system. Service products are easy to import to other systems when they are productized well, and the pricing is simple
-	Result reporting takes time and is felt to be too much location bound	Interactive systems are capable of having reporting functions that supports resource usage
	Findings related to customer relationship and competitive position	
-	Customers have expressed wishes for service development	This means that any new thing will have fewer opposition when change is already a wishes thing
-	Customers have expressed wishes for better integration to their systems	This may be too much to ask for, but it is possible to include import and export features but actual integration would bound too much to one technical solution that is too expensive

The first finding was the one that set the course of this project. You cannot succeed without control of your selling efforts, and you cannot control efforts without totally knowing the whole process. The second finding relates to how easy it is to develop and integrate the current system to a supporting tool. The third finding set a feature to a tool. One of the most important findings is that customers are already asking for improved system that would offer more support to their way of working.

As seen form Table 9, most findings contribute as a requirement. These cannot be separated in categories or groups so easily, but the requirements are similar in most cases. The different requirements, enriched with suggestions from Data 2 how to improve them in the new sales process, are presented in Table 10.

Table 10. Requirements from the CSA findings, enriched with suggestions from Data 2.

Finding	Requirement(s)
1. No sales process has been defined accurate enough	- Business sales process has to be defined with acceptable accuracy - The sales process has to be validated by the case company management
4. High level of productization and simple pricing	- Sales process has to take advantage of the high level of productization and Simple pricing, making process parts simple would lower costs. - In solution that support the upcoming new process there should be feature that guides customers through and variables - A feature that lets customers their selves to configure the service within the limits of requirements for approval and verification
6. Result reporting is seen as difficult and time consuming	- A feature that automates result distribution in a not-location-binding way.
8. Customers are asking for an easier and more organized system to support their business	- Automated messages that notice both the customer and the service technician - Strict timetable assistance - Simple to use - A reporting feature for past and present

The suggestions shown in Table 10 include a list of items that have to be a part of a step in the new sales process. These suggestions were collected as Data 2 from the discussions with stakeholders.

The list *shown* in Table 11 presents these additions as the items that are essential for the new service and customer satisfaction and therefore need to be included in the new sales process.

Table 11. List of additional items to be included in the new sales process features (from Data 2).

Item	Outcome
1. Interval signal	Based on stored interval and previous calibration data
2. Customer Data	General information of customer location and contact person.
3. Customer machine data	What are the required calibration quantity, range and last results?
4. Timetable	What is the customers' timetable definition? When was the last calibration? How does it suite to technicians own timetable?
5. Prices	Does the customer have a contract? Did he/she receive a discount last time? Any other price aspects to know before quoting?

As seen from Table 11, these are the items that need to be included when making the new sales process which specify when, how and how much information to the customer.

6.2 First Proposal

The first proposal includes two sections. First section is a new process for sales in the case company. The process is defined as crisply as it can. It is also defined so loose that it suites if not all than almost all cases. The second section is an action plan, which is given to the case company managers with the proposal, which includes the proposal of a tool that would support the process defined before. The definition includes a list of technical requirements and features that the tool should have in order to support the whole process. Both proposals are presented in more detail below.

6.2.1 Proposed Sales Process

The proposed sales process includes the best practices from literature and requirements identified in the current state analysis, as well as suggestions from Data collection 2. The process abides a formula of actions that either create a factor in the whole process or lets the service technician to move to next step with added knowledge. There are two different sales transactions that differ by starting point, or by very nature of contact. First, the sales transaction where the customer is the so-called “old customer” who has been visited before and who the case company has a very good knowledge of. Second, the sales transaction where the customer is previously unknown to the case company and the customer is the one who makes the first contact.

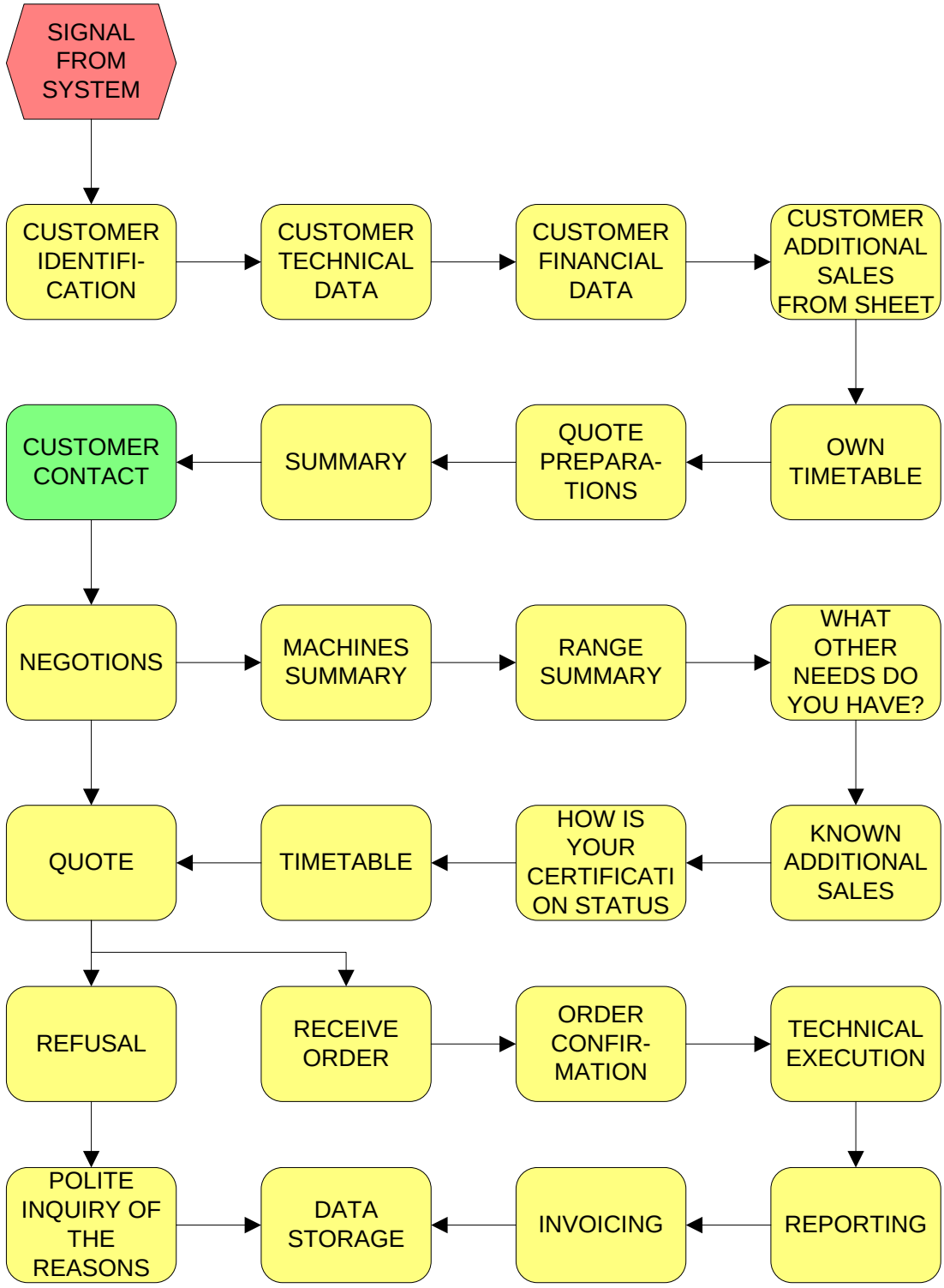
The first sales transaction is a process which starts with signal from the case company’s own system that customers own defined time interval is going to end and that their machine or machines need calibration. The steps are presented in Figure 7. The first step is customer identification where services technician identifies customer by name on location. The second step is to identify the customers’ machines with its special requirements. The third step is to check the customers’ financial data whether customer receives discounts or is on the black list and needs to pay in front before the technical execution.

The fourth step is to check from additional sales sheet the items that customer needs or could need and items that customers is known to purchase elsewhere. The fifth step for service technician to check the customers’ timetable requirements and his/her own timetable. Sixth step is to prepare the quote draft version and seventh to summarise all to him/her-self. Eighth step is to start negotiations with the customer.

Next, there are two possible routes to step number fifteen. Steps number 9 to 14 is for the customers that need negotiations and/or are in a different situations then the last time around. In these steps, a service technician confirms from the customer that all needed services are quoted and all the technical aspects are in order. Step 15 is when service technician delivers a quote for the agreed services. After the quote, there is a possibility of refusal. This is step number 16, Case B. In Case B, a customer refuses the quote and buys the services elsewhere. After step 16 B, comes 16 C where the service technician kindly inquiries for the reason for refusal and then goes to step 21 to store the transaction and the reason to data storage. In step 16 A, the customer orders

the quoted services and step from 16 to step 21 are just order fulfilment including the most important step of invoicing. After service fulfilment the last step is to store the transaction and service information to data storage.

Figure 7. The proposed sales process for the first transaction case.



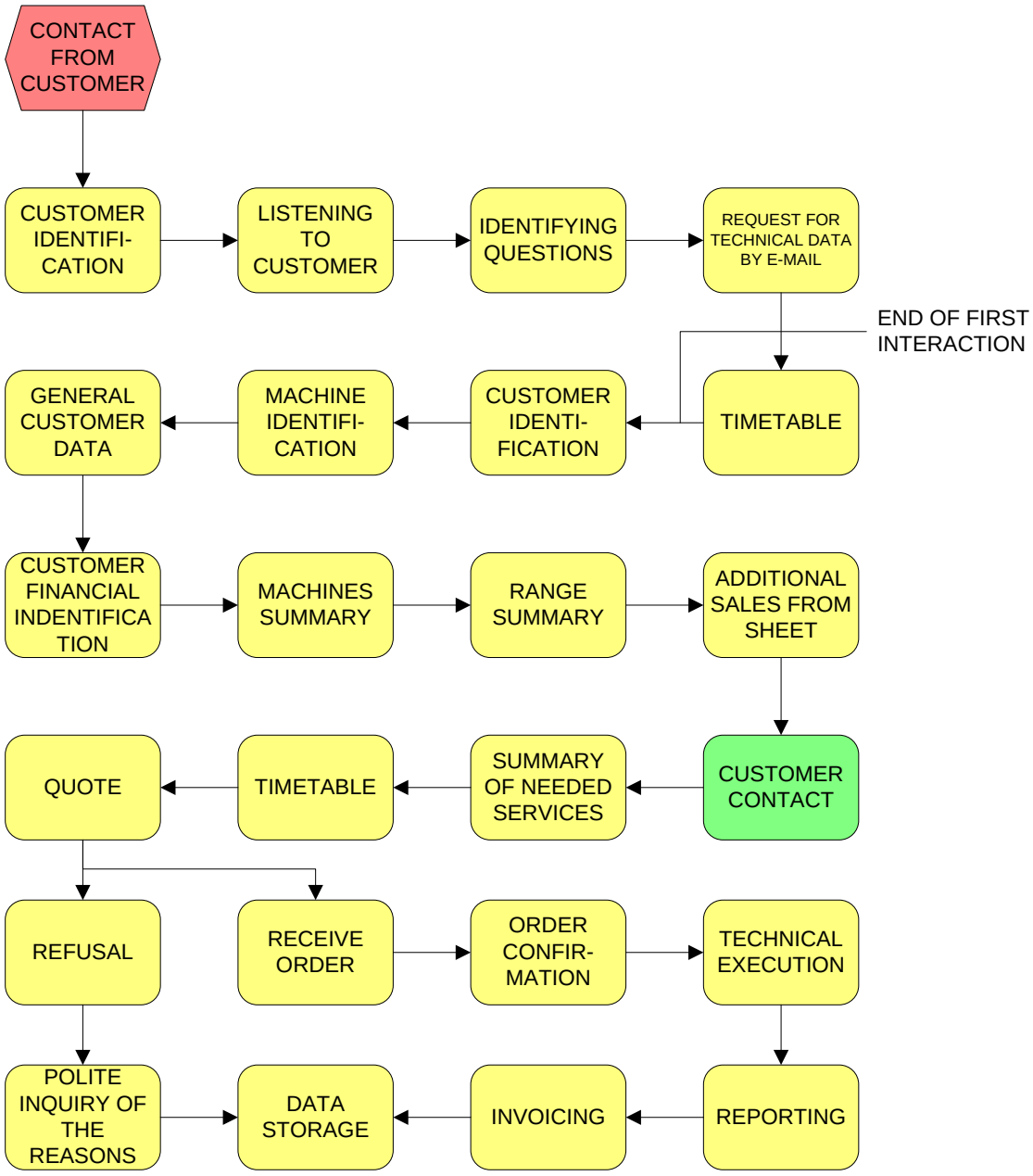
The first sales transaction is a process which starts with customer contact. The steps are presented in Figure 8. The process differs from previous only in the beginning. The step from step number sixteen onwards are same as in the previous process. First step is to identify the customer.

Second step is to listen to the customer, what he/she has to say and how he/she points out the needs and how he/she reasons the made decisions. Listening is really important, and it is also important to listen to what a customer is not saying. Step three is where technician asks the identifying questions like machine size, questions that delimit the service. Fourth step is to ask for customer to send all technical data by e-mail. Fifth step is to palpate the timetable requests from the customer. After step five, the first customer interaction closes.

Sixth step is to re-identify the customer, but this time to identify customers industry and business. Seventh step is to identify customers' machine. Eighth step is the general customer data. Who is he/she using on certification, what kind of different products does customer offer to their own customers, and other meaningful information? Ninth step is to sort out customer financials. Tenth step is the machine summary. Eleventh step is the range summary.

Twelfth step is the additional sales from sales sheet. After step eleven service technician contacts the customer. Step thirteen is to summarise the needed services to customer. Fourteenth step is the confirm timetable requirements from the customer. Fifteenth step is to make an official quote. After this step the remaining steps are the same as in previous transaction.

Figure 8. The proposed sales process for the second transaction case.



The proposed process is seen as ideal for the following reasons. It takes account all the factors of data that appear in all of regular calibration tasks. It takes account the stored data that has to be in use for the technician. It identifies the need for a signal of upcoming tasks. It defines the timetable requirements. It defines the window for interaction, and possible additional selling.

6.2.2 Features of the Future Sales Tool

This study proposed a sales process to improve sales activities in the case company. It concerns only one department due to its unique services that are unlike other services offered by the case company. The proposed sales process offers a detailed sales process description. In addition, to facility the proposed process, the study also suggests the features for the tool(s) to make the proposed sales process possible via internet. The new sales process tool needs a set of features that would enable the functions suggested in the new sales process above. The features for this tool are summarized in Table 12.

Table 12. The features for a tool or tools to support the proposed sales process.

Feature	Description
Calibration interval control	Tool has to have a data entry for last calibration and calibration interval. It uses these entries for signaling of upcoming tasks.
Machine range control	Tool has to have data entry for range and quantity of last calibration, and additional information for how it was derived
Customer data	Customer name, visiting address, contact name, contact information, and special conditions.
Customer invoicing data	Info on invoicing, discounts given, and additional sales
Reporting	Feature for reporting and distribution of reports. Digital signature from workflow.
Additional information	Data storage for pictures, files or anything that customer has unique or worth telling for to next calibrator.
Reporting Function	Report of any performed quantity. Additional feature of predictions for next year from interval control and previous invoicing information.
Easy to use interface	All customers must feel at ease to use the tools customers interface. It must be so easy to use that even customers that are most foreign to smart services can handle it.
Controllability	There has to be a possibility to turn of signals. When not liked it may alienate customers.
Additional sales proposals	There should be a segment for marketing services that customers do not usually gain but might consider if sold in addition to regular service.
Short video teachings	Feature that allows for the case company to input advices and teachings in short videos.

The features listed in Table 14 are the features derived from both the requirements for the process and from the existing knowledge from successful smart services. The most important feature is the interfaces usability. The tool must be so convenient to use that it seems to be an improvement even with those customers who oppose all evolution. In addition, the case company must make sure that all customers know how to use the interface and how to make those configuration decisions on their services. Short videos are a great tool to use for educating customers. Teachings could be on as simple as how to use the interface, or on the difficult part like defining your machines extensometers range.

When the tool development is in the stage of final features written down, the third step is to choose a subcontractor that will manufacture the tools IT-parts. The case company has an It- subcontractor for this kind of cases that is preselected by public bidding contest as a provider for chosen period. They do not have to use the subcontractor, but they can put it to public bidding as a whole project. When the features are ready the subcontractor should be involved already. In ideal development project the subcontractor is taking inside the features development for expert advice on possibilities and for commenting on solutions.

6.3 Validation with the Company Stakeholders

The next step is additional feedback and refining the proposal before tool development and process implementation with the tool.

The initial proposal was presented to company managers, and got an instant approval to proceed to the development to the second stage. The second stage means that the process will be equipped with a tool that will be developed to support the proposed sales process. The evaluator considered this approach as logic and useful, since designing a tool without a streamlined process may bring additional challenges; therefore, all features must be specified in advance.

The tool features were presented to the company employees, service technicians to be accurate, and it was discussed thoroughly. Technicians gave a lot of feedback that will be taken into account when designing the next version of the process. In most process phases, the employees were satisfied with the proposed steps and the future tool features, but some were suggested to be changed. Firstly it was agreed that the custom-

ers' financial data will be collected to a sheet as information, and the service technician will check it out in the first phase when recognizing the customer.

In the validation session, it was decided that the new process will be sent to an IT-subscriber to evaluation and then a meeting will be called to discuss the development of the tool that would the support the process. This was agreed to happen during the summer 2015, but no accurate timetable has specified. The one important learning from the previous projects was that the final time table should not be set too early to the developers before all the requirements are established and all the participants are heard.

Summing up, the first step that the case company management is to do is to once again thoroughly study the process proposed in this Thesis and to validate it with decisions on the tool development and good rigorous instructions on how the case company wants its sales activities to be handled from its implementation. Second, the case company needs to involve the whole department to the new process by asking them to participate in developing the tool further and refining the process based on the team work. The final proposal should seek a full approval from all parties. The next stage of the project will thus include more stakeholders, and the project will expand to a tool development project to enable the new process.

6.4 Final Proposal

There were some modifications that emerged from the validation phase. The first is that customers financial data should be gathered together somewhere, and all employees should be able to reach that data. It is vital that it is made easy to reach and usable.

The second modification is that additional selling will be made even easier by changing pricing in such a way that it enables discounts in additional services if the agreed conditions are met. The conditions required are that the additional service offered would bring less actual costs to company when done together with the prime service and that service technician is able to do it with moderate equipment additions. The idea is that is a services technician is already in the customers facilities and is not able to service another customer in the same day, the extra hours could be sold in a cheaper price. Otherwise, the final proposal keep the same content as shown in Figure 7 and 8 ad Table 12.

7 Discussion and Conclusions

This section contains the summary of the study, practical implications for the proposed operational model and next possible steps for the future development. It also contains the evaluation of the study by comparing the outcome with the initial research objective. Finally, validity and reliability of the study are discussed.

7.1 Summary

The original goal of this Thesis was to make a proposal of a tool used to enhance sales efforts and to make communication more interactive. The current state analysis proved a problem that has to be solved before a tool design can be started. The discovered problem led to main goal of this Thesis, improvement of the current sales proposes. The goal after the discoveries in the current state analysis was to create a new sales process for the case company department of In-Site calibration of testing machines. The proposed process targets to improve the business agility and cost efficiency of the case company.

The current state analysis pointed out that the case company had no defined sales processes introduced. This means that all the department employees have created their own way of working. The current state analysis also revealed that the case company has a high level of productization and simple pricing methods, customers have expressed desires to improved system of any kind, result reporting and distribution takes time and is unnecessarily bound to location, and that predictions are that physical distribution of reports will be changed in the future for a better process. Based on the current state analysis, the focus of this Thesis was to create a new sales process for the case company department of In-site calibration of testing machines.

The search for existing knowledge and best practice was done as a two phased process. The first phase was to search for existing knowledge to study the reasons for the customers to buy calibration services. The second phase was to study the business demands for smart- and self-services, service design, business process management and value creation in services. The theory section was focused on the sales process modelling which was reflected in the conceptual framework constructed after literature review.

For building the proposal tailored to the case company, the business requirements revealed in the current state analysis were analysed against the findings from the literature review and enriched with the suggestions for the new sales process from the company stakeholders. The proposal contains, first, the map of the new sales process and, second, a list of features that a tool that should have to support the sales process created this Thesis. The tool is designed to help service technicians to be able to fully follow the sales process.

The outcome of this Thesis is a proposal of a new sales process. The proposal for the process for sales in the case company is also supported by the outline of the online tool by listing the features for such a tool that would support the proposed sales process. They both have to be adopted together, because the new process was developed so that it would not work without the supporting tools. The proposed new process requires some practical changes to be made before it can be totally adopted. The first one is that all data obtained with the help of the new tool could be reached by all relevant employees in the department. This does not happen currently, and this needs to be in-built in the tool. The second practical change is that customers should be brought into the process sooner than before. This requires all functions to be transparent to both sides of the interaction, ideally as an easy-to-reach online tool, which was therefore proposed in this study. This transparency will create more convenience to customers, and for the case company will results in more satisfied, loyal customers and will enable additional sales and more service co-creation with customers.

The proposal for the new sales process and tool features were approved by the case company management in a validation session. By fully implementing the proposed process and the tool, the case company will also come into the position to save time for further service development rather than just saving costs. The world around is developing fast in every sector of business, and it is important to be on the front as providing the latest services according to latest demands and needs.

7.2 Practical Implications

This study gives the case company management the keys for developing calibration department to better achieve company targets and to get a possible boost in sales. The process is done so detailed as it was seen fit to be able to implement it to actual working environment.

PI-1. The next step for the management is support wider feedback from all the stakeholders in the case company and, if necessary, to further refine the proposals. After refining the features for a tool, or tools, are to be handed over to It-subcontractor for evaluation and development. This development takes time but has to be done right for the first time.

PI-2. The implementation should be done in two phases. The first phase, after the tool or tools are developed and tested, is to train all employees to use the tools. This can be done by the IT-subcontractor. Training to use the tools is extremely important. It lays down the foundation that all employees will stand on when interacting with customers or making sales efforts after that. If the foundation is not solid enough, meaning that all functions are not trained properly, the new process will not contribute the benefits it was designed to.

PI-3. Before implementation, the case company management have to make sure that all employees are on the same page with new tools and processes. Taking them inside the development early on to be able to participate on refining the process and tool is important. The best possible phase of the whole project to take employees inboard is the refining. It is easier for a group to develop a finished proposal which was developed using conventional study methods rather than starting the development from scratch.

PI-4. For more future recommendations, it would be a good idea to start defining the sales processes throughout the whole company department by department. This would give an edge to the case company by facilitating adaptation to future changes. When a change on law requirements comes, they might come as a surprise. When this comes, having well defined processes will help continue the development.

7.3 Evaluation of the Thesis

This section evaluates the outcome of this project compared against the research objective defined at the beginning of the study. Additionally, validity and reliability of the Thesis are evaluated and compared to the plan which was defined in Section 2.4.

7.3.1 Outcome vs Objective

The main objective of this Thesis was to build a new sales process to enable the sales of the case company calibration department. The proposed process had to address the needs from both the customers for improvements and the organization's requirements from the management, management systems, and employees. The outcome of this Thesis is a defined sales process and a list of features for a tool or tools that would enable the new sales process. The proposed process and tools features fulfil the requirements of both customers and the case company.

In this Thesis, the proposed model answers a set of three questions. Firstly, the proposed sales process enables additional sales by making data available to all employees. Many times the calibration department faces a difficulty with lack of knowledge of the customers' history even with the same department. This makes it really difficult to make service proposals when the whole possible situation at the customers' site is partly unknown. Secondly, it starts to suggest that customers can be a part of the process earlier than they were contacted in the past. This may lead to additional value created. This is an unknown, but the existing knowledge suggests that value is created together with the customer and that it is created in the interactions with the customers. Value creation is an important development step towards the operating procedures of the current best performing service companies.

Thirdly, it enables the pinpointing of the reasoning for the customer to acquire calibration services. It gives the case company a partial access to the customers mind and to make sales speeches with solid foundation from standards and law act. This is really important. In the current model, the case company service technicians do not interact with the customer if customers do not make or return contact. A simple signal from the tool that would include reasoning on calibration would change the whole situation.

If the proposed tool for the new sales process is developed, it will help the case company to save on costs and increase sales also by making additional services possible. It also helps by creating more loyal customers more the case company by offering more continuity for their services

7.3.2 Reliability and Validity

The Thesis has been done following the guidelines and principles of a case study research approaches qualitative research method. Examination of its validity and reliabil-

ity makes a quintessential part of the approach. The validity and reliability plan was discussed in the Section 2.4 for the purpose of this comparison.

Validity of a qualitative research can be measured by comparing the outcome of the thesis to its original object. In other words, does the outcome answer the research question or solve the business problem set out to do. The proposed sales process and supporting tool features accomplish the main objective of this Thesis and thus can be aforethought to solving the business problem set out to do in the beginning of this study. Additionally, the data collected and reviewed at his study needs to be accurate and interpretation of the data should avoid the research bias. There are many guidelines on how to avoid the research bias. The way used in this study was to examine alternative ways or best practices from the literature, and by giving thought to alternative explanations and by involving the main stakeholders. The data used in this study was compiled from trusted sources such as case company internal data, and extensively selected academic articles and books. Finally, the proposed sales process and tool features were presented on writing and verbal form to the case company and accepted by the management who commissioned the study.

The main method of measuring reliability in qualitative research is by questioning if the result would be the same when the same study would be performed by another researcher or in the different point of time. In this study, the result would very likely be the same if the study would have been conducted by another researcher, if assuming that the data sources of CSA would be the same. Using the same data sources such as interviews, discussions, the case company documentation, benchmarking, international standards, and law would probably lead to same outcome. If the research was done in different point in time, the result might be different. The case company is constantly evolving, and so are some of the data sources like standards and law acts. These kinds of changes compel a different outcome even with otherwise same research.

The reliability of the thesis can be enhanced by using variable data sources, data collecting methods and keeping up with well documented research process. In this study, five different data collection methods have been used. Methods include interviews and discussions with the case company employees, customer surveys both in writing and face-to-face, analysis of the case company documentation, benchmarking competition, and literature review for business requirements for both process management and internet based services.

To increase reliability and validity of the outcome, more interviews with both the customers and the case company employees would absolutely benefit the evaluations and might lead to more fine-tuned proposals. Due the schedule for this study this was not possible. Finally, the validation sessions should have been earlier for enabling the data 3 collection and proposing a validated process. This was not possible due the time strains of some stakeholders of the case company. Both these facts, without any doubt, reduce the reliability and validity of the outcome of this study. Still it needs to be noted, that the proposal was accepted by the commissioning manager.

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