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STH SYSTEM TESTING – CHANGE MANAGEMENT

CASE WÄRTSILÄ

TURKU AMK
TURKU UNIVERSITY OF APPLIED SCIENCES

BACHELOR'S THESIS | ABSTRACT

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The objective of this thesis was to provide a comprehensive analysis of Wärtsilä's current development process. Under examination was the process itself and the used working methods and habits during the development process. the examination was performed from the point of view of change management and the overall objective was to provide a suggestion of improvements for the development department of Wärtsilä. The development process of this thesis is part of Wärtsilä's new reforming process where Wärtsilä aims to achieve significant savings in the manufacturing time and overall efficiency.

In this thesis, the theory of change management was examined from the corporation's point of view. The focus was on a project level but the individual change management is also presented. Data acquisition was implemented by researching the literature and using existing studies. The development process was examined by personally taking part in the development process and by interviewing the development group. The interviews were performed by using the research survey. All levels of the development team attended the interviews.

Between current state of the process and the research theory, the gap -analysis was implemented. The results give the future development ideas for Wärtsilä's development apartment. One of the results of the Gap analysis was the importance of information. In many cases the needed amount of information was not fulfilled. The results of this study can be used in future in different fields of technical industries development processes.

KEYWORDS:

Change Management, Service Design, Process Development

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MUUTOSJOHTAMINEN JA UUDET TYÖSKENTELYTAVAT

Tämän opinnäytetyön tavoitteena on tuottaa Wärtsilän tuotannonsuunnitteluyksikölle kattava analyysi nykyisestä kehitysprosessista ja sen toimintatavoista osana tuotannonsuunnittelun kehitystyötä, sekä tuottaa mahdollisia parannusehdotuksia nykyiselle kehitysprosessille. Toimintatapojen tarkastelussa keskitytään muutosjohtamisen näkökulmaan ja sen avulla pyritään mahdollistamaan kehitysprosessin onnistuminen. Kehitysprosessi, jota tämä opinnäytetyö käsittelee, on osa Wärtsilän tuotannon uudistusprosessia, jossa se pyrkii saavuttamaan huomattavia säästöjä, sekä kasvattaa tuotannon tehokkuutta.

Tässä työssä muutosjohtamisen teoriaa tullaan käsittelemään yritysmaailman näkökulmasta. Teoriassa tullaan keskittymään projekti -tason muutosjohtamiseen ja samalla sivutaan ihmisten johtamismenetelmiä. Käytettyjä menetelmiä tiedonhankinnassa ovat kirjallisuusanalyysi sekä olemassa olevien tutkimuksien kartoittaminen. Kehitysprosessia tarkastellaan omakohtaisen kokemuksen lisäksi haastatteluilla, joilla hankitaan tietoa nykyisen prosessin toimintatavoista ja lisäksi kehitystiimin parannusehdotukset huomioidaan.

Nykyisestä prosessista ja koostetusta teoriasta muodostetaan lopuksi Gap -analyysi, jota hyödyntämällä pystytään tarjoamaan parannusehdotuksia, sekä uusia toimintatapoja seuraaville kehitysprosesseille. Analyysissa huomattiin erityisesti viestinnän merkityksen korostuminen heti prosessin alkuvaiheilta alkaen. Tämän opinnäytetyön tuloksia pystytään hyödyntämään myös muiden vastaavien teknillisten alojen kehitysprosesseissa.

ASIASANAT:

Muutosjohtaminen, Palvelumuotoilu, Prosessinkehitys

CONTENT

FIGURES

LIST OF ABBREVIATIONS

Change Management (CM)

Enterprice Change Management (ECM)

Individual Change Management (ICM)

Organizational Change Management (OCM)

Service Design (SD)

1 INTRODUCTION

The objective of this thesis was to provide a comprehensive analysis of Wärtsilä's current development process. The process and methods of the development process were under examination. It's proven by many different researchers and professionals of change management over than half of the changing processes will be ended up failing. This is the reason why this thesis was performed. The Wärtsilä wants to create the solid successful development process and one purpose of this thesis is to serve a role as useful tool for Wärtsiläs development department. The goal is to made a comprehensive research from the change management and use the studied theory to analyze the Wärtsiläs current development process. First step was to gather the needed theory of change management. Second was the data acquisition where the current process was reviewed by many different methods. Lastly the analysis between the studied theory and the data acquisition was executed.

In this chapter the scope and objective of the thesis will explained. Furthermore, the reader will get a comprehensive knowledge of the Smart Technology Hub and the Validation point of view will be examined. Validation is one of the key points in this study as the development process regarded to this thesis is focused in the testing and validation process.

As mentioned earlier Wärtsilä was the customer for this thesis. Wärtsilä is a large company which works with wide range of technology industry. The main products for Wärtsilä are the diesel engine, LNG engines and also the diesel/LNG powered powerplants. In the future Wärtsilä wants to have increase sustainability and efficient productivity. That is the one reason why Wärtsilä is rapidly developing the processes. Wärtsilä employs over 17 000 people globally. This thesis will focus Wärtsiläs new transformation project called STH. The STH stands for the Wärtsiläs new Smart Technology Hub which will be explained further in the chapter *1.3 Smart Technology Hub – STH*. In the future Wärtsilä wants to keep the leading role of the market. In order to achieving that, great more efficient and modern processes are needed.

1.1 Objective and Background

The scope of this thesis is to develop a data analysis for the Wärtsiläs STH development group. The data analysis will focus in the testing part of the Wärtsiläs product manufacturing. The Wärtsilä has placed the target to achieve 50 faster testing process. The product testing includes currently the testing of the engines, the finishing and the painting. In the future the variety of products can increase, because the world is changing rapidly, and the technology is rapidly developing. Future products will be considered while designing the future testing process. In this thesis the focus will be in previously described process and how well the process is preforming today, and which parts are needing more attention.

The purpose of the thesis is to produce the comprehensive study of the change management using the existing knowledge from former studies and literature of the field. Next step is to get acquainted with the Wärtsilä's already existing development process and the parts of the development process needing improving. The current process is familiarized by observation, researching and interviewing. Lastly, there will be a comparison of the real process and the theory of the process. How well these two will link together is also going to be concerned. Any grievance found and the propositions for improving will be brought to acknowledgment. The structure of the thesis is demonstrated below in *Figure 1. Thesis plan.*

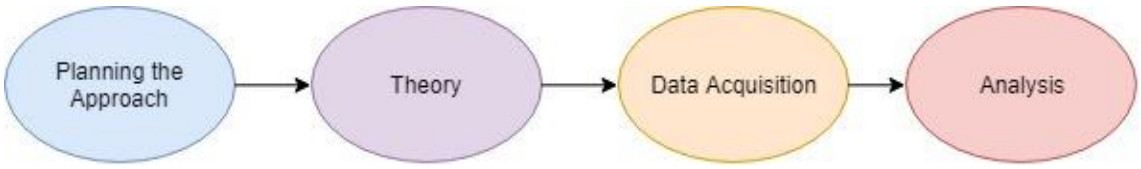


Figure 1. Thesis plan

The field of the change management is very comprehensive and the challenges within must be reckoned while bordering the topic. The theory part is analyzing only fields of the change management being bounded on the topic of the thesis. As an example, Wärtsiläs development of process department uses a lot of service designing methods in its own process designing, which has given a lot of value in the thesis.

1.1 Demarcation

In this chapter the topic demarcations are performed. One of the biggest issues of the project will be creating theory. The change management is a wide field of study and the theory needs to focus in the field of process development. The research will be done by using existing literature and research. In the thesis focus will be in the different levels of change management. The service Design is also implemented in this study by request from the Wärtsilä. The Wärtsilä is using the service design as a tool for development processes and it is a crucial part of the analyzing the development process.

The data acquisition will be performed by using the personnel data collection called “hands on”. The second and the most important method will be the interviews. The focus of the interviews will be in the process level. More precisely the collected data needs to be collected from the change management point of view. Example the communication, main focuses, schedule and timing of the process will be included in research interviews.

The data analysis will gather the collected data and created theory together and there will be a challenge to create an interview which can provide the planned result and be analyzed with the gathered theory. This needs to be considered when planning the interviews. Overall the change management point of view must be kept in mind when planning and creating both the data acquisition and the theory of change management.

1.2 Smart Technology Hub – STH

In this chapter Wärtsilä's new technology center project will be explained. Development process which is also the subject of this thesis will be implemended in the new technology center. Hence, it's essential part of the introduction and it will be introduced comprehensively. Validation point-of-view is also taken into account in chapter 1.2.1 *STH Technology Validation.*

STH stands for Smart Technology Hub and it's Wärtsilä's new smart technology center which will be structured in Vaskiluoto, Vaasa. STH will be a Wärtsilä's new headquarters in Vaasa. Today Wärtsilä has five different working locations in Vaasa. In the future all of those will be merged into STH. This will be a more efficient way to develop, design and manufacture because everything will be in same location. And because of that everyone has quick access in every part of manufacturing process. One of the main goals for STH is to be modern and competitive in today's rapidly developing world. Technology is changing faster than ever and we must make quick changes to our way of work. Catchphrase of STH is that everyone in the world are coming into Vaskiluoto and take the learning how they should perform and manufacture their products, not other way around.

Construction process of the STH will be started in summer of 2019 and 2021 building will be finished and manufacturing can begin. When finished STH will employ approximately 1500 people. Although it's still two to three years until it's even finished development process is firing with all cylinders. New working ways has been development and future models of working will be taking under consideration.

In the new smart technology hub will be many partners including in working. Example there will be own space for the co-operative universities and other parties. Universities are included because Wärtsilä wants to get outside ideas and thinking to develop and keep its's position in one of the top engine manufacturers in the world. Also, in the future Wärtsilä wants that STH will be capable of doing more than only engines. Wärtsilä is determined to develop 100% renewable energy solutions and for that it need to change its product range and supply more than a just engine products. In the future STH will be more efficient and sustainability way of manufacturing than world has ever seen.

One part of the new technology hub is to offer customers more than just products. This means that in the future Wärtsilä wants to increase its part from offering more services.

That means that Wärtsilä has noticed that world is changing rapidly and if it wants to keep its leading position in the market it needs to offer more services and flexible solutions for the customers.

1.2.1 STH Technology Validation

The scope for the Smart Technology Hub is to decreas product development time by 50% compared to today's process. This will cause rapid changes in field of manufacturing and designing. This chapter will explain how the decreased time-to-market time effects in Validation point-of-view.

Every product and system needs to be properly validated. Today's methods of the testing have to be re-evaluate and taking under the consideration. As in the first chapter was mentioned a new validation process needs to be 50 procent more efficient. Order to accomplish given requirements needs to take account variable field of different testing processes. In product preparation area needs to evaluate can we develop the pre-testing further so it can degreace the testing time used in testing cell. This regars in automation testing and virtual validation.

Crucial for improving the technology validation is to further develop virtual validation, simulations and modelling. Benefits of the virtual validation are decreasing time needed in the testrun and also need of the testing equipment will be decreased. Virtual validation Rig and Single Cylinder Engine testing will be a crutial part of validation, because they are cutting down the full -scale testing time. Thre consept of new testing and validation includes both long term testing and also piloting at customer installations. Software development(product automation), process development, test and release of new updated versions should also be taken under conciderations.

Other aspect is that testing facilities can be used by different organizations. This includes Research and Development, factory itself, workshops, services and also external partners which all shoud be able to use testing enviroments. This will required a major changes because in today's factory testing environment is no need specific testing tools which are used in R&D. But, when testing will focusses in one location only there is no need for having many of same testing tools because of the different locations. Test's should include component or system testing including SCR with auxiliary equipment.

One of the test cells will have capability to specific testing of the power production and auxiliary equpments. The test cell will be designed for SCR including auxiliaries. Capasity management will also be important to ensure to stakeholders that testing assets will be as efficient as designed.

Transient behavior: Dynamic positioning control, acceleration, deceleration, grid code, change of operational modes, optimazion of systems and system integration is part of the virtual validation consept. System test setups are planned to be mechanical or Hardware-in-the-Loop as called (HIL). HIL allows that multiple testing cells are simultaneously in use(with different parts are in testing) and together with other hardware from different testing cell it can comprise the testing data and make the testing process more efficient. Also capability of remote Factory Acceptance Test (FAT) will be taken under prospect for the better customer experience.

2 THEORY OF CHANGE MANAGEMENT AND TRANSFORMATION

The scope of this thesis will be focused at process development from Change Managements point of view, as it was mentioned in the chapter *1.1 Introduction*. Purpose of this chapter is to convey the theory of Change Management and how it affects in company's transformation periods into the readers mind. Also, one of the main goals is to highlight the importance of Change Management's role in corporations' transformational processes. When reviewing an objective; the goal is to bring many different aspects and observations to the readers knowledge regarding the Change Management. Service design's point of view will also be reviewed through the Change Management's perspective.

Change Management has a variety of steps regarding company's transformation. These are: Defining the vision, determining the strategy, creating a communication plan, identifying and engaging stakeholders, creating a plan for testing and lastly instructing the people. Change Management gives the right tools for managing these steps in the transformation of a company. (Rouse, 2018) Creating a plan for testing (1) and instructing the people (2) are the two most important phases regarding when creating this thesis.

Change Management is a complicated field of study. Company called McKinsey made a research which showed that 70% of all the transformations ends up failing. There isn't one unequivocal reason concurring why only 30% of companies succeeds in their transformations. Referring to Forbes's article of Change Management; the most common mistakes are a lack of training, -planning and -communication. These issues will be further explained in chapter 1.2.1 *Individual Change Management (ICM).*

Change Management's role in transformation process is vital. Pursuing change without professional management will almost certainly end up in failure. Change Management gives the right tools and mindsets to the managers, when the transformation process succeeds. (Stickdorn, 2017) One of the goals in this thesis is to concretize what right tools and mindsets can achieve.

Why the change is indisputable? One common and used way of proving importance of the change is to bring everybody's attention some negative feedback from customers, which need to be solved immediately. Also, good way of explaining the importance of the change is to show current and futures competition views and justify to workers our need to develop. Without required changes people's working positions can be threaten for good. More specific details about effective Change Methods are shown in chapter *6.1 Conclusion*

2.1 Definition of Change Management

Change Management can be explained from a vast variety of different aspects. Let's start with the defining what is the meaning of change in the development process. Business Dictionary explains the word change as followed: "Colloquial term describing the effects or outcomes after the transition or transformation of a function, method, or thing. For example, a person may state that since the changes in the manufacturing process, his job has been a lot safer." (Business Insider, Dictionary 2019) This definition is detailed, and it connects the change with the practice of process transformation, which is also one of the key points in this study. Role of change in today's world is significant. Faster reactions are required more than ever in rapidly developing world. (Prachi Juneja, 2018) Increase of competition in corporate environment is massive. Ability to implement needed development into any given level of an organization must be done rapidly.

What does the term management stand for in development environment? Cambridge Dictionary defines the term management as followed: controlling and organizing of something. Management can also indicate a group of people which are responsible for controlling and organizing a company. When management is associated with change it can be described as a transformational tool which enables organizations certain goals to be achieved. Management involves terms like forecasting, planning, organizing, commanding, coordinating and controlling. (H. Fayol, 6) All of these principles are also connected into Change Management.

Now we shall proceed into definition of Change Management. It is a term for planning, designing, organizing, leading and guiding in a transformation process. (Huong, H. 2014.

2) As it was described in the beginning of this chapter; Change Management as a concept is a comprehensive tool for dealing with change and it can be utilized on all levels of change. Main purpose for Change Management is to prepare for the change, conclude the transformation and maintain the transformation successfully.

2.2 Different Levels of Change Management

As demonstrated in figure below (Figure1) Change Management (CM) can be divided in three main categories: Individual Change Management (ICM), Project Change Management and Enterprise Change Management. These levels significantly differ from one another, but there are few similarities. CM begins at the organizational level, second is a project level and final step is individual management. (Prosci, 2017) In this thesis scope will focus on project level and cross an individual management as well (Figure 2). The different levels of Change Management's will be categorized below.

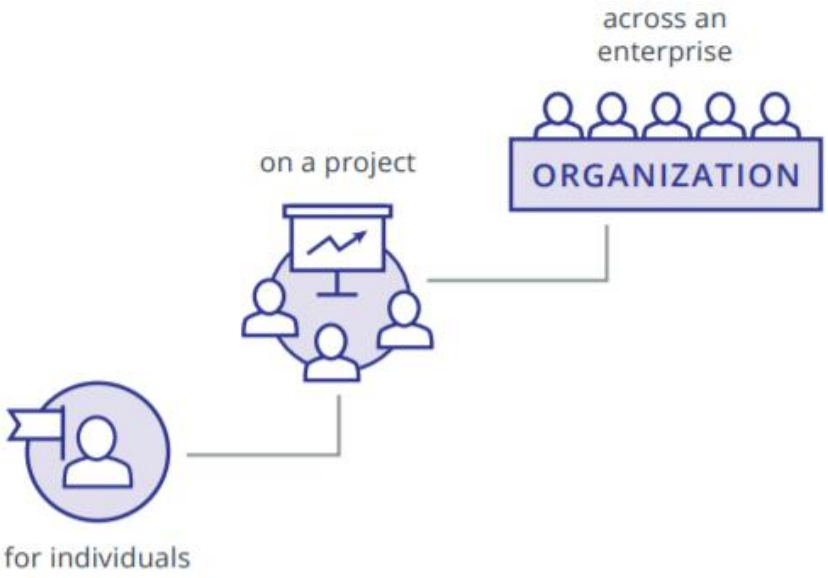


Figure 2. Three steps of Change Management (Prosci 2017)

2.2.1 Individual Change Management (ICM)

Term ICM means guidance, motivation and correct communication method to any given individual. Acknowledgement of individuals is one of the key points when viewing management of people. This refers to how people want to receive the information regarding upcoming changes and most of all who is delivering it. When is the right moment to bring the transformation out and what is the proper amount of time required in addressing it? Individual change management pursues answers to these questions.

Often people's attitude towards a change can be negative. The negative attitude is usually a reflection, which comes from thoughts of increasing workload. People are believing that new way of working more efficiently will cause them more working tasks in the future. Other big reason for resistance of change in a nutshell is that people are a feared that their job will not exists in the future operations. (Myllymäki 2017, 45) Most important thing when solving these problems is to bring all the needed information to the workers.

In this paragraph we will take a deeper look in to delivering information in ICM. Scope and goal of the transformation needs to be bright in everybody's mind who are affected by the change. (Kotter 2008, 42) If the information is not executed properly and with care, whole transformation process can be driven into uncertainty, which can generate negativeness and resistance in people. This can cause failing of whole transformation process and it needs to be taken seriously. Also, enough time should be given to the people so that the given information can be processed properly. If people don't have enough time to handle the change it can cause again uncertainty and people can start to resist the change. (Myllymäki 2017, 29)

1.1.1.1 The ADKAR -principle

One of the most popular Individual Change Management tool in the world is made by Prosci Management consulting company and it's called ADKAR model (Figure 3). ADKAR model is designed specifically for managers to manage their people through transformational periods.

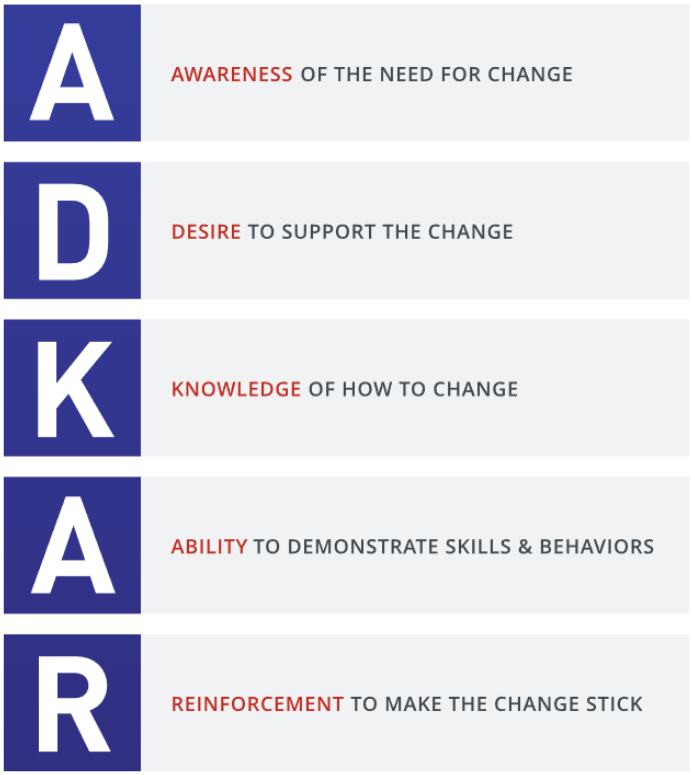


Figure 3. ADKAR Principle (Procsi 2017)

Its principles can be divided in five main categories. First step is the awareness of what's causing the change. Second is to create an atmosphere which motivates people involved with the change. Third step is knowledge which is highly relative to communication. Good knowledge cannot occur without impeckable communication. Fourth step concerns the ability to demonstrate skills and behaviors. In this step, amount of practice will make the difference. You need to be properly prepared before you implement the change. If you

won’t practice you will not perform well. This applies greatly in change management. You don’t want to have any “hick-ups” along the way. Final step is reinforcement. It’s a step where after you need to make sure that individuals are following the new working practices. Afformentioned ADKAR -model states that new working habits need approximately 66 days before individuals internalize them. (Sonia Pearson, 2015) The ADKAR -model can also be implemented in all fields of Change Management, and not only for the individual management.

2.2.2 Organizational and Enterprise Change Management

Organizational Change Management (OCM) focuses on a larger picture. It oversees the individual management and controls the projects level of the change. In organizational management the first stage is to identify the groups which are affected by change. Next step is to generate a specialized plan for ensuring that employees who are involved in transformation are fully informed regarding their own role in a transformation. Leaders should have trainings where they learn how to manage and motivate their workers in OCM. OCM and ICM shares a focus; transformation must be done in the most efficient way . (Prosci, 2017)

On the top is Enterprise Change Management. ECM is going beyond the scope of this thesis and it’s only shortly explained in following chapter. Scope of ECM is to create a corporate level management plan and its focus is implementing the changes in all fields of involved organizations. In enterprise change management focus goes over the individual and main goal is to target bigger implementations in organizations point of view.

2.3 Service Design (SD) Part of Transformation

When looking into a scope of this thesis the Service Design is a commonly used method in Change Management and it will be reviewed. In this chapter theory and process of Service Design will be under examination. Questions like: What the Service Design stands for? What is the purpose of Service design? How Service Design is used in the development process? and Which are the specific working stages to complete perfect development project by using SD -methods? will be answered.

Service design is a widely used tool for making development designs. Scope of the Service Design is to generate a comprehensive knowledge for the developers of all the requirements and improvements. These steps are needed to be done in order to develop a flawless service design. Service Design is divided in different working steps which combined should give the developer tools to create a perfect design of the new services. In chapter *2.3.1 Working Stages of Service Design* different steps of Service Design will be explained.

There are many general principles in service design. In this chapter there will be pointed out few of them relative to the development process of this thesis. First and most important point is to understand importance of customer-oriented approach. Change processes should always be focused in customer needs but also, internal needs of business need are to be considered. Customer feedback is in key position of creating transformation plan in service design. (Maria Hayhow, 2014)

After the customer-orientation comes efficiency. In Service Design main goal is almost without exceptions to make service more efficient. Efficiency can be achieved in many ways but regarding to Interaction Design Foundation's (2019) article of service design: efficiency can be considered by concentrating first in overall service plan and design and not to focus in component by component designing first. This means that focusing on one small part of the process is not going to affect overall results greatly. Other remarkable principles for service design are found on list below.

- Services should be designed on the understanding that special events (those that cause variation in general processes) will be treated as common
- User should always be taken into account
- Prototype should be always grated
- Clear business case and model must be designed
- Services should be developed as a minimum viable service (MVS) and then deployed.
- Services should be designed and delivered in collaboration with all relevant stakeholders (both external and internal)
  (Interaction Design Foundation, 2019)

In this thesis's development process's all the listed principles will be implemented in some way and overall development process in Wärtsilä is utilizing these service design principles. Overall Service Design is comprehensive method which combines many different aspects of planning and implementing transformations in corporate world.

2.3.1 Working Stages of Service Design

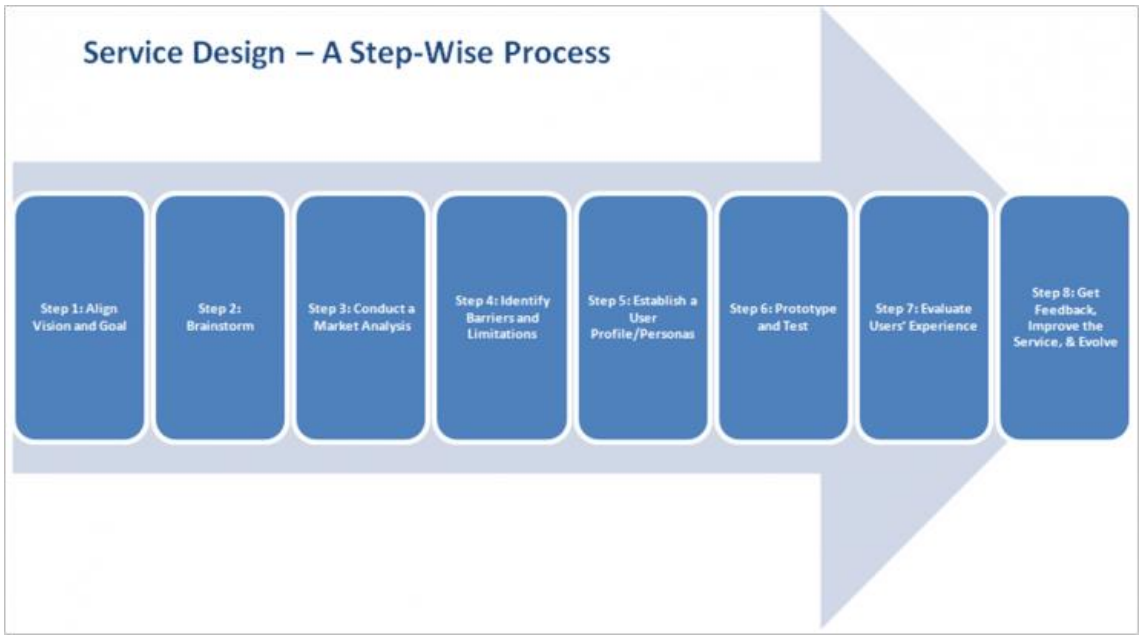


Figure 4. Working Stages of Service Design (Cleverism, 2018)

In figure above is demonstrated main steps of service design process in chronological order. In this chapter working steps of service design are explained. Working phases are divided in eight categories which are explained below.

First step is aligning the vision and goals of the transformation. How the process under development is fitting into company's overall strategy, will be analyzed in the coming paragraphs. Common issue is that process which is under development has ran too far away from company's targets. This can be evaded by thinking of methods to design transformation in a way that it supports company's goals in the best possible manner. (Cleverism, 2018)

Second step is called brainstorming. In this step it's important to gather hard working and dedicated group to execute the brainstorming. With the right people it's easier to gather hundreds of ideas. It will be hard to find and insulate right ideas from the unnecessary ones. (Cleverism, 2018) Inside a working group, ideas should be sorted in categories. Examples of these would be unworkable or even unrealistic ones. Article of Change Management in Cleverism is listing few good tips for brainstorming:

- Allow everyone take part in planning ideas
    - Introvert people should be courage to present their ideas
- Write down the ideas
- Present the ideas in a group
- Reviewing the ideas in a group

Regarding the last point of the list's (Reviewing the ideas in a group) is a helpful tool to separate the good ideas quickly from unusable ones.

Third step is a conducting a market analysis. This means that current market status will be examined. After reviewing the current market status, you should consider how the new service will fit in the current market. After the reviewal of status, it's important to think how to improve existing services way so that new service can challenge the current services, or how the new service can coexist with the current services in the market. This can be very complicated to fulfill but with the enthusiastic working group it's achievable. (Cleverism, 2018)

First of the three steps will be out of the scope of this thesis, but knowledge about them is essential, because without that knowledge it's impossible to understand the whole process of Service Design. Next the last five steps will be explained, which are more related in development process regarding this thesis.

Fourth step is establishing a user profiles/persona. This steps goal is to develop a concept of the new service through customer orientation. When determining the user profiles, it's important to create as many different profiles as needed. Overall picture needs to be thorough and it must take count all variety of the customers. (Cleverism, 2018) After establishing the user profiles it's time for Touchpoint Design. Touchpoint Design starts the designing because in Service Design everything is built for customers point-of-view. Touchpoint Design means to design every part where client interacts with the process. Good examples would be website, paper documentation, a touch panel, signature or even a phone call. (Stanford, 2018) Research regarding the designing tools for different touchpoints can be found in literature.

After Touchpoint Design it's time to move to concept designing. This phase greatly correlates with given project and its status. It's important to create many solutions for the coming services. Perfect execution for the new model doesn't need to be completed to

utmost completion. Most important is that it’s showing the new ideas in efficient way. When the Designing is completed its time to engage the doers. Workers are the best group to evaluate the new designs. (Stanford, 2018) Engaging the doers is called prototyping and, in this phase, you should invite the workers to test and give opinions about the design. Based on given feedback prototype should be modified and further developed.

When all the aforementioned phases above are completed, it’s time to make conclusions of the collected information, requirements and documents. When Combining all phases of the Service Design, developers should have a comprehensive knowledge what requirements needs to be taken care of and which aren’t relevant. Afterall, Service Design is a useful tool which can be used widely in field of transformational design. It gives thorough foundation of successful process designing and it’s widely used in field of process development.

3 CURRENT PROCESS AND DATA ACQUISITION

In this chapter the current state of process and questions like “How the current development process is performed?”, “How the designing process is executed?” and “How the customer orientation is included in designing process?” will be answered alongside with data research. The focus is to explain the current status of the process and collect as much useful data regarding as possible. Data collecting will be done by many different methods, but the main way will be interviewing. The interviewees will be chosen by their level and position in the development process.

In this chapter the thesis will examine development processes scope relating to thesis goals. The scope is to examine the change process part, which includes the following topics: customer orientation, planned approach, engaging the doers and the piloting phase. As aforementioned few of them is focused more than the others. Planned approach, customer orientation and engaging the doers will be the focus in this thesis. Reason for that is that during time period of this thesis the development process in Wärtsiläs was in these steps. More information and detailed explanation in the steps can be found in the chapter *3.1 Development process.*

This development process is considered as the pilot version which means that in the STH -process development, all the areas of manufacturing will be examined and redesigned soon. This gives this thesis more value because the findings in this thesis can be implemented in the upcoming development processes one of them being the engines assembly process.

3.1 STH Development Process

Development process is divided in three main phases. First step is determining processes current status and what is necessary to do in order to determine the negative or neutral value providing propositions in the current process. Second step is to create a new action plan by utilizing what we learned in step one. Final step will be piloting. Piloting means testing the new action plan in practice. Every step is divided in multiple subsections which are explained in chapter *3. Interviewing the project team*

Schedule of the development process can be found more important than any other aspect, since it decides the amount of resource dedicated to everything in the process. Wärtsilä dividedes schedule roughly in four main phases: reviewing the process, building the STH process, piloting and evaluation and refinement. This thesis will review all parts of the process excluding the *Evaluation & re-finement.*

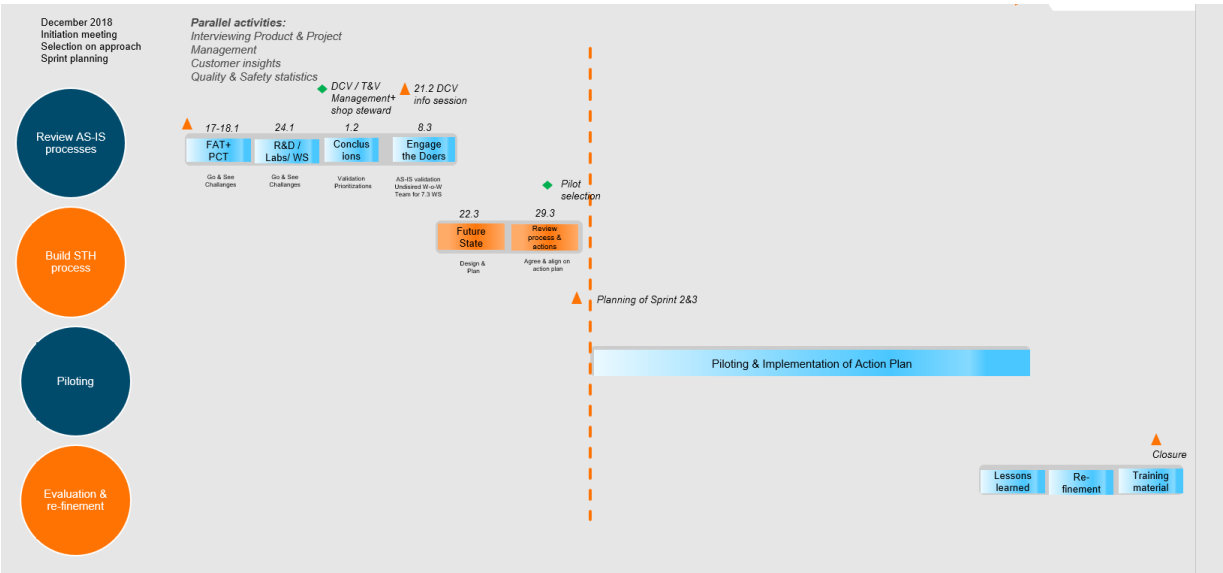


Figure 5. Process plan

3.2 Engaging the Doers

First step of development is started by making a review of current process. Reviewing was divided in four main steps as show in Figure 2. The objective for the workshops was to engage the doers to create more receiving atmosphere for the future communication. The workers will be providing a crucial information regarding the status of current process. One of the key point is to find right methods how to activate the whole group of workers.

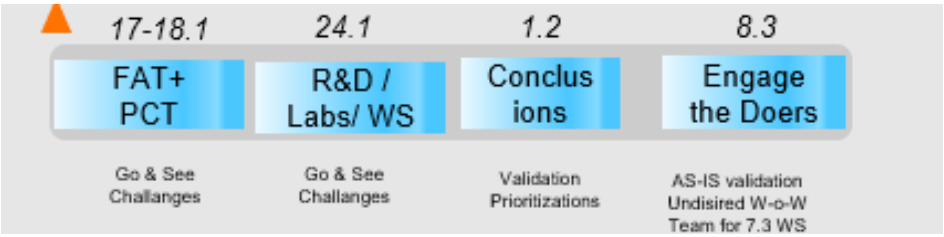


Figure 6. Step one Reviewing

Step one took place 17 of January 2019. It began with testing facilities and observing overall process. This part of the process was done before this thesis started so the focus will be in the latter parts. Second one was to review research and development, and laboratory. In this part work group went in to these working places and heard people out and made notes of what needs to be done in order to make testing process more efficient. That data analysis relating to that was brought to its initial conclusions February first of 2019. And after that in early March, began the final step: engage the doers. This step began with so called workshop. 40 doers were invited to assist with the process and gathering of those people took place in an auditorium. Those 40 workers were divided in groups of four after short introduction about the STH and overall development process.

After introduction, working groups were given an assignment where everyone must individually think about testing processes current problems for five minutes. After everyone came up with own ideas of what are the biggest issues then groups started to discuss about their own ideas inside of a group and put the best ideas down on a paper. This processing method is called Nominal group. Next step was to go through group by group all the main issues.

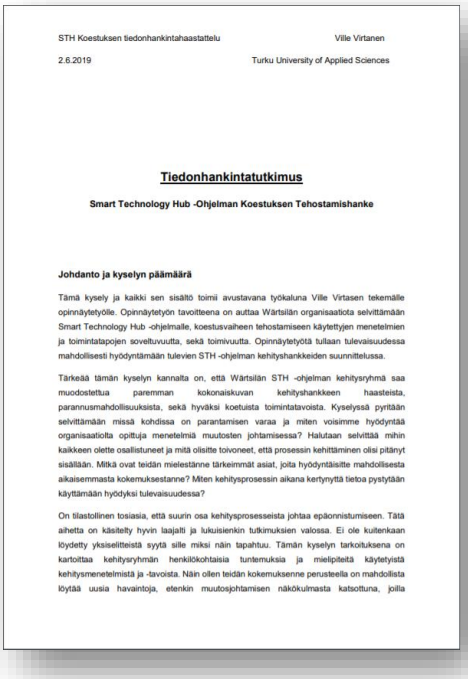
Second phase was to choose most valuable problem and that was performed by using 100€ method. This means that every group has a 100€ to spend on the problems and

they should give most of the money to what they think is the biggest problem. And for the second biggest they should give second most etc. After evaluation the results was gone through group by group.

Final task was to choose one issue and made a root cause analysis (RCA) out of it. Root cause analysis is a method which is used to determine cause of problem. (Serrat Oliver D, 2009) In this workshop work groups chose one problem and then they had to ask five times why this problem happened? Wärtsilä believes it's possible to find roots of the problems that way.

3.3 Interviewing the Development Group

Purpose of interviewing the development group will be to gather information regarding the development process and to gather data from used and proven methods. Background and research will be provided through interviewing the mentioned development group. Interviewing the mentioned group face to face was preferred over a survey, because discourse with Wärtsilä provided necessary amount of evidence to suggested that the topic was too ambiguous and intricate to be handled through a survey. Interviews were planned by using the guidelines from chapter *2. Theory of Change Management and Transformation.* Interviewing plan is presented in Figure 6. on the right. Data was acquired from managers of the development group. They were chosen because of their knowledge and overall awareness of change management. Overall goal for the interviews was to get thorough image of what Wärtsilä is trying to achieve and what are the designed methods to achieve the new more efficient processes. Change managements point of view was taken into account when planning the interview.



STH Koestuksen tiedonhankintahaastattelu Ville Virtanen

2.6.2019 Turku University of Applied Sciences

Tiedonhankintatutkimus

Smart Technology Hub -Ohjelman Koestuksen Tehostamishanke

Johdanto ja kyselyn päämäärä

Tämä kysely ja kaikki sen sisältö toimii avustavana työkaluna Ville Virtasen tekemälle opinnäytetyölle. Opinnäytetyön tavoitteena on auttaa Wärtsilän organisaatiota selvittämään Smart Technology Hub -ohjelmalle, koestusvaiheen tehostamiseen käytettyjen menetelmien ja toimintatapojen soveltuvuutta, sekä toimivuutta. Opinnäytetyötä tullaan tulevaisuudessa mahdollisesti hyödyntämään tulevien STH -ohjelman kehityshankkeiden suunnittelussa.

Tärkeää tämän kyselyn kannalta on, että Wärtsilän STH -ohjelman kehitysryhmä saa muodostettua paremman kokonaiskuvan kehityshankkeen haasteista, parannusmahdollisuuksista, sekä hyväksi koetuista toimintatavoista. Kyselyssä pyritään selvittämään missä kohdissa on parantamisen varaa ja miten voisimme hyödyntää organisaatiolta opittuja menetelmiä muutosten johtamisessa? Halutaan selvittää mihin kaikkeen olette osallistuneet ja mitä oilsitte toivoneet, että prosessin kehittäminen olisi pitänyt sisällään. Mitkä ovat teidän mielestänne tärkeimmät asiat, joita hyödyntäisitte mahdollisesta aikaisemmasta kokemuksestanne? Miten kehitysprosessin aikana kertynyttä tietoa pystytään käyttämään hyödyksi tulevaisuudessa?

On tilastollinen tosiasia, että suurin osa kehitysprosesseista johtaa epäonnistumiseen. Tätä aihetta on käsitelty hyvin laajalti ja lukuisienkin tutkimuksien valossa. Ei ole kuitenkaan löydetty yksiselitteistä syytä sille miksi näin tapahtuu. Tämän kyselyn tarkoituksena on kartoittaa kehitysryhmän henkilökohtaisia tuntemuksia ja mielipiteitä käytetyistä kehitysmenetelmistä ja -tavoista. Näin ollen teidän kokemuksenne perusteella on mahdollista löytää uusia havaintoja, etenkin muutosjohtamisen näkökulmasta katsottuna, joilla

Figure 7. Iterview Guide

Interviews started by planning goals. Questions like; How the current process is performing? Are the made efforts enough regarding the communication in the development process? What can be done better and are the current methods enough for achieving the given goals? should be answered. Questions of the interview were divided in three categories. The first one was "*First contact with the development process."* In this category the goal was to gather crucial information from interviewee, how the interviewee got involved with the process and was there enough time to prepare for the development process. Also communications was considered in this category. Second category in the interview was dedicated for the main focuses. The priority of this part was to make the interviewed ponder over main goals and are those fulfilled as Wärtsilä needs. In the third part focus was in processes overall progression. The goal was to gather information about project schedule and how well it has been holding up.

3.3.1 Interview Results

In this chapter the results from the interviews are under examination and will be thoroughly analyzed. The interviews were conducted with skype, because of 5 hours driving distances between interviewer and interviewees. Each interview took one hour, and total target group composed of two managers from STH – development process. Overall goal was to achieve clear data of the most challenging parts of the process. And which are from the change managements point of view the most challenging parts of the process. The results will be later analyzed in chapter 4

Results from *First contact with the development process* was fascinating. Schedule in the development process was experienced to be close to perfect. Given timeline was well thought and there were no major problems according to interviewees. From communications perspective improvement suggestions were given. Involvement of the whole organization was experienced to be insufficient. Wärtsilä is worldwide organization and in large changes like STH, support from whole organization is crucial.

Also, other point which was pointed out in this category, was one of the root causes for the lack of communication. The reason for the lacking communication was experienced because the people from the development group was not giving the maximum efforts for to achieve given requirements.

One of the crucial aspects for the development process was to engage people and to make them feel that they have important role in change process. If people were to think that their output matters, theoretically their input to the process would be greater.

In the second category the interviewees described the main focuses from the project and are those done in the most beneficial way to the process and Wärtsilä. Interviewees were eager to point out different topics and it seemed like that target group prioritized some aspects over others. The most valuable topic in this research was involving and inspiring the development group. In this step, catch phrase "bottom up" was used to describe the preferred method of approachment. Bottom up approach means to start from lower levels of Wärtsilä and then rising all the way to manager levels. It was decided that such approach would benefit all parts of the command chain.

Meaning of communication was also considered as a priority. Target group felt like that communication in "general level" was enough, but it wouldn't hurt if communications priority were to be increased. Planning was pointed as another key point. Interviewees experienced that the planning, especially at beginning plays crucial role in development processes success. In this context planning refers to overall planning and timing of the process. Lastly the customer orientation was also pointed as one of the main focuses. Customer orientation is playing important role in this process. Customer are valued highly in Wärtsilä. That is the main reason why the overall transformation is planned for the customer. The goal is to make the process transparent which can be productive for both Wärtsilä and the customers. Wärtsilä wants to stay competitive and try to maintain its leader position in the current market.

When the interviewing of target group was conducted, a problem regarding personnel in the process was brought to the attention of study. Target group felt like that some of the personnel in STH wasn't following the processes objectives. Processes scheduling wasn't affected because organization and personnel were able to relocate resources when deemed necessary. Weekly meetings with "white board"-approach was found to be great tool for relocating resources. In the "white board" method the current status is

reviewed by three different categories: To do, Working Progress and Done. With this method the whole development group gets comprehensive knowledge where their own process is heading at and they got to know how the other teams are performing.

Lastly in the third part of the interview goal was to gather information regarding the time schedule and how well the processes methods are working. In this category the interviewees mentioned the operational excellence. Regarding this topic the idea of better development should be considered. Wärtsilä's goal in operational excellence is to make it part of its DNA. This means that development of the processes should be always ongoing and its should not only focus in change management processes.

Also, the final topic which pointed out in the interviews was the signification of given resources. In Wärtsilä the cost –effectiveness is under review and it effect also in the development process. If the resourcess are limited its crucial to develop substitutive methods to achieve given targets.

4 DATA ANALYSIS AND CONCLUSION

This chapter will be solely dedicated to analysation of data. Data analysis will be done using gap –analysis method which is widely used tool for the analysing the status of the project. (Business Dictionary, 2018) Gap analysis is done between the created theory *2. Theory of Change Management and Transformation* and the acquisitioned data *3.3.1 Results from The Interviews.* The key point is to focus the analysis in the correct parts of the theory and to find the right ways to utilize the findings from the data acquisition.

In the chapter *3. Current Process and Data Acquistion* Wärtsilä's development process was thoroughly reviewed by using the different variety of acquisition methods. The collected data is giving comprehensive knowledge how the process is performing. In the C*hapter 3* data collection was divided in two main phases, which were workshops and interviews. Gathered data will be treated as equal in this analysis.

The object for the analysis will be to find which parts of the process are currently performing well and where is potentially opportunity for improvements. In this chapter data analysis will be performed. Founded results from the data acquisition will be explained and analyzed due the change managements point of view. The Service Design is also taken into account when analyzing the gathered data. Data analysis will provide to reader the comprehensive knowledge how the current development tprocess is performing in Wärtsilä and which are the the key points of the process. Data acquisition provided many variety of data from the process and part of the points were explained already in the chapter *3. Development Process and Data Acquisition.* In the analysis most valuable parts of the collected data were chosen. Selection of the data were performed by using personal knowledge and the valuing the collected data. Comparabless to the theory was also one of the criteria how data was selected in the analysis.

Analysis will be performed in three different categories as was the interview. In the each category at least few rised topics will be analysed and goal is to achive the thesises goal to provide wärtsilä improments and overall analysis from the development process. These foundings can be implemented in the following development processes.

4.1 Analysing the Results

This analysis was produced based on the data from thesis target group. The theoretical parts link to results has been defined in planning phaces. This method was determined, because it will provide added value to the data analysis. In the early phaces of analysis, it can be stated that the collection of data, was a success in those areas of change management which were planned to be brought forward in the goals of thesis. The parts of theory regarding individual management and its meaning gives useful information considering the analysis. As aforementioned, the analysis will be split in three zones, where the collected data will be analyzed. The analyzation will happen according to the aforementioned split in the data collection phase.

The analysis will ponder over the problems in current process, provide useful theory regarding process development and lastly will provide possible development proposals if they can be produced with theory. As first phace, the results of interviewing phace will be processed. In the *first contact with the development process* –phace following themes rose from the data: success of scheduling, interestingness of process, and meaning of communications. Every part was considered to be succesfull except communicatons. STH was experienced as intriguing and interesting project, which will considerably contribute to peoples motivation and performing in the work tasks.

As far as it come for the communications, the noticed problems were shortcomings in organizational level. Problems was informations outwarding. It was felt as insufficient. Part of the reason for this shortcoming was considered to be the ongoing savings. All of people from different geological locations were not flown to necessary places, and as a result planning of the process got more complicated. The theoretical part handles meaning of communications and awareness of everything that is happening, which are vital in order for the processes communications to succeed. The meaning of communications has been brought forward in picture three (3.) Change managements theory states that communication should always be considered as an upcoming failure, and this way of thinking will activate those people necessary to communications succeed, to think in a way that which can help to detect root reasons in the earlier phases of project. More information on the communications are mentioned in chapter *2.2.1 Individual Change Management.*

Next the main focuses of the process will be analysed. Many different cornerstones rose in the acquisition of data, and certain cornerstones were chosen, because those were deemed to be most useful and important when considering the goals of Wärtsiläs organisation and this thesis. Involving people rose as one of the more meaningful areas. As development process proceeded its meaning bulked and therefore it was chosen to be the major for this step of analysis. Involving people has been well received, because the results have been nothing but positive. Wärtsilä uses so called bottom up -method which basically means that involving people will be started from the lower levels of Wärtsilä. The method then rises one level of organisation at a time. Bottom up -method will make the lower levels of organisation more heard, therefore the people will feel to be more of a keyplayers in the successes, and this helps to create an environment which will boost the chances of processes success. Change managements theory will provide added value to Wärtsiläs ways of operating. Change managements ADKAR -model is a good example, which could be taken advantage of when involving people. ADKAR model can be found from chapter *2.2.1 Individual Change Management.* Adkar models desire phase is designed to provide tools for involving people.

Timing plays an important role in the communications and enabling proper flow of information should taken account for. Processing data should also have sufficient amount of resources and time. Informing all parties involved should be clear and unambiguous. Communication should never contain too much information. Adkar models methods will heighten the chances of informations flow success. It is very much recommended that those will also be taken account for.

The flow of process will be the last zone, when going through the results. It will bring up themes such as meaning of flexibility, current processes functionality and enhancing of schedule. Flexibility was considered to be one of the most successful areas in the process. The challenges which rose as process rolled forward, were well faced, and the reactions for them were swift as stated in the chapter *3.3.1 Interview Results*. From theory will service design support flexibilitys angle and will provide different sorts of methods. Flexibilities effects and overall methodicalness, according to service design are very important. This phase also analysed processes structure. In general level, the structure of process was thought to be well working and it has enabled the positive results. The structure of process was influenced by Service designs methods and the process was split into four main phases; acquiring data, development, piloting and maintenance. Hereby the process will take advantage of the proven methods.

4.2 Conclusion

Change management is well studied and complex branch of science. Finding the proper target groups was one of the biggest challenges. Change management offers necessary tools, and if it wasn't for them, the success in change would be near impossible. Goal of these tools were to provide new points of views for Wärtsiläs process. They provided solutions for scheduling, diversity of communications, involving people and flexibility will provide alternative possibilities for execution of the process.

The goal of thesis was accomplished as desired. This thesis had a goal to provide comprehensive analysis of the development process and to provide suggesions for possible improvements. Change managements and service designs point of views were taken advantage of in the analysis of data. Added value form theoretical parts of the study were deemed as a success. Acquisition of data managed to collect comprehensive amount of data and from that data, it was possible to find roots of problems for the aforementioned main focuses. Analysis -stages results were compared to the state of process and suggestions alongside with models regarding involving people and communications.

The results of this study can be applied for different sorts of change managements projects in the field of technology. Received results can be used as an assisting tool when one wants to add value to their companies process. The results of this thesis will be utilized in Wärtsiläs development process as well as in the forthcoming processes.

REFERENCES

Boris Ewenstei, 2018 Link:

https://www.mckinsey.com/featured-insights/leadership/changing-change-management

Huong, H. 2014. Change Management for Sustainability

Margaret Rouse, 2018

https://searchcio.techtarget.com/definition/change-management

Myllymäki, R. 2017. Muutosjohtamisen opas, Johda muutosta, jotta muutos ei johtaisi sinua

Pranchi Junea, 2018 Link:

https://www.managementstudyguide.com/change-is-the-only-constant.htm

Prosci 2017, Link

https://www.prosci.com/resources/articles/what-is-change-management

Serrat Oliver D, 2009

https://www.adb.org/publications/five-whys-technique

Sonia Pearson, 2015, Link

https://tallyfy.com/adkar-model/