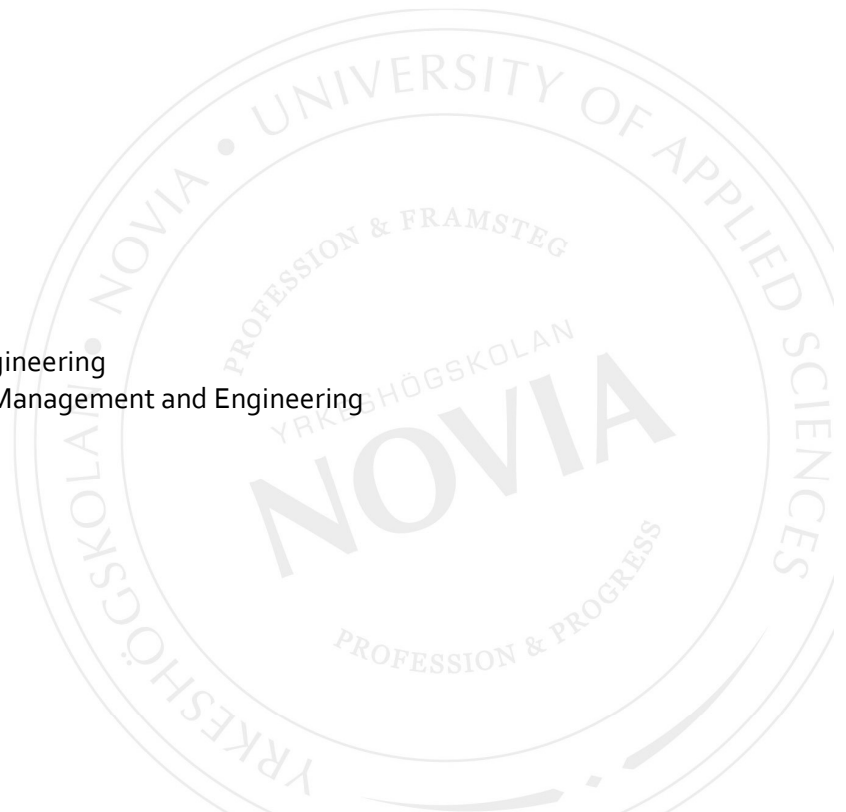


Creation of a Beginner's Guide and Worksplrit for Project Engineers, Mechanical

**A Case-Work Study for Wärtsilä Energy Business,
Engineering**

Jonthan Viklund

Thesis for Bachelor of Engineering
Programme in Industiral Management and Engineering
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EXAMENSARBETE

Författare: Jonathan Viklund

Utbildning och ort: Produktionsekonomi Vasa

Handledare: Mikael Ehrs, UAS

Anders Ahlqvist, Wärtsilä

Titel: Skapandet av en nybörjarguide för projektingenjör-mekanisk

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Bilagor

Abstrakt

Detta examensarbete är skrivet på uppdrag av Wärtsilä Energy Business vid Engineering avdelningen. Målet med detta examensarbete var att skapa guidelinjer för att hjälpa den nykomna mekaniska projektingenjörens arbete och att skapa en arbetsfördelning mellan en mekanisk projekt ingenjör och en mekaniska chef projektingenjör. Vilket kommer att hjälpa processen för implementationen för den nyanställda till positionen.

Idag är de existerande guidelinjerna utdaterade och behöver uppdateras. Nya instruktioner behöver även skapas för att försöka täcka alla möjliga uppgifter. Sättet att dela upp arbetet mellan den mekaniska chef projektingenjören och den mekaniska projektingenjören har inte ännu tagits upp och skulle vara en bra lösning för individer som inte har jobbat med varandra.

Utförande av detta examensarbete gjordes genom teori och kvalitativ forskning. Teorin går genom hur att förbereda, skapa, granska och korrigera instruktioner och guidelinjer. Dessutom kommer den inkludera sätt för att tackla problemet varför inte användaren läser manualen. Intervjuer hölls för att samla information om vad den nyanställda kämpar med inom sitt dagliga arbete.

Resultatet för detta examensarbete är uppdaterade och nya guider, följt av en arbetsfördelning fungerande som ett Excelverktyg.

Språk: Engelska

Nyckelord: Ingenjörsvetenskap, instruktioner, dokumentation,
arbetsfördelning

BACHELOR'S THESIS

Author: Jonathan Viklund

Degree Programme: Industrial Management and Engineering

Supervisor(s): Mikael Ehrs, UAS

Anders Ahlqvist, Wärtsilä

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Abstract

This thesis is written on behalf of Wärtsilä Energy Business, Engineering department. The aim for this thesis was to create guidelines to help the work of a newcomer to the Project Engineer Mechanical position and create a work-split between a Project Engineer, Mechanical and Chief Project Engineer, Mechanical, which will help with the process of the implementation of a new employee to the position.

As of today, the existing guidelines are outdated and needed to be updated as well with writing new instructions to try to cover every different possible task. The way of splitting up the project work with the Chief Project Engineer and Project Engineer Mechanical has not yet been brought up and would be a good solution for people that never have been working with each other.

The execution of this thesis was conducted through theory and qualitative research. The theory will go through how to prepare, create, review and correct instructions and guidelines. In addition, include ways to tackle the problem of why users are not reading the manual? Interviews were done for gathering the information of what a newcomer struggle with in their daily work.

The results of this thesis are updated and new guides together with a work-split, functioning as an Excel tool.

Language: English

Key words: Engineering , instructions, documentation , work-split

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1 INTRODUCTION

This is a thesis for the degree of Bachelor of Engineering in the field of Industrial Management Programme. The thesis is written on behalf of Wärtsilä Energy Business and corresponds to 15 credits in the vocational university Novia University of Applied Sciences. This chapter will give a resume of the thesis. First, the background and purpose behind the thesis will be presented, followed by the research plan, delimitations and finally the disposition.

1.1 Background

Opening of new positions occurs frequently at Wärtsilä. With new positions comes new employees – experienced and less or no experienced - either way it takes a lot of time for all to become orientated into a new job. Being new on a position and adjusting to the working site can be confusing, overwhelming and demanding. Moreover, the way of working is constantly changing with new updates, systems and programs that arises. Searching on the company's intranet can be difficult and time consuming and as the old saying states "time is money". Therefore, this becomes a negative pattern for the company. How will the new employee proceed to get the help that is beneficial? And can the implementation of a new employee be measured in money? Is there a way to shortcut this? Let us find out.

Together with all the learning and new information that the new employee has to absorb, he/she is at the same time receiving his/hers first tasks. Before realizing it, they will be the primary mechanical project engineer for new and ongoing projects. Along with these first assignments comes the first interaction with the project team. During a project's different phases there might arise some unclearness with the work-split between the PE (Project Engineer) and the CPE (Chief Project Engineer). Who will do what and when? What responsibilities will the PE respective the CPE have? Currently there is a re-organization of the company structure, which is resulting in that the CPE's is moving from the department of Project Management to the department of Engineering, which is the same department as the PE's are in. This reorganization might have a great influence and relevance on the job and the question of how to divide the working tasks will become even more relevant.

1.2 Aim

The aim of this thesis is to facilitate the implementation process of a new employee into the Project Engineer Mechanical position. By identifying the challenges in the daily work of a Project Engineer, the study at hand will result in a manual and a solution. Moreover, this thesis seeks to optimize a work-split template between the Chief Project Engineer Mechanical and the Project Engineer Mechanical into more usable. This thesis will therefore eventually result in a clearer way of working for the new employee and might also cut the implementation time and resources which in the end could save costs. Interviews will be conducted in order to explore the research questions. On basis of the qualitative research on the employees of Wärtsilä and with the scientific theoretical framework, the need of guidance and work-split will be created.

Research questions are:

- What problems do newcomers find in their daily work?
- What kind of guidance would be helpful?
- What is the PE's perception on how the work should be split?
- What is the CPE's perception on how the work should be split?
- Why aren't the users reading the guidance instructions?

1.3 Delimitations

Since this thesis is written to and ordered by the department of Engineering in Wärtsilä Energy Business, hence the focus will lie on the position of a Project Engineer and a Chief Project Engineer within the mechanical discipline. Moreover, the results of the thesis will be highly contextual as the thesis is ordered by Wärtsilä and may not be applicable in other contexts and in other companies. However, the result of this thesis will not be immutable and will be recommended to be updated by time. Even though the thesis work is ordered by Wärtsilä, the company has not been taking part in the planning of the interview question or the analysis of the data. One limitation with the study is the small and homogenous study sample and there is a risk that the information of the study did not reach everyone that meet the inclusion criteria. Nevertheless, the limitations do not prevent other to find practical use of the thesis.

1.4 Dispositions

The structure of the Bachelor's thesis is as follow:

Chapter 1 – Gives the reader and introduction to the background, purpose and research plan.

Chapter 2 – Introduce the reader to the company Wärtsilä and the Project Engineer
Mechanical position.

Chapter 3 – Consists of the theory behind the thesis.

Chapter 4 – Consists of the method used.

Chapter 5 – Presents the results.

Chapter 6 – Concluding conclusion and future research.

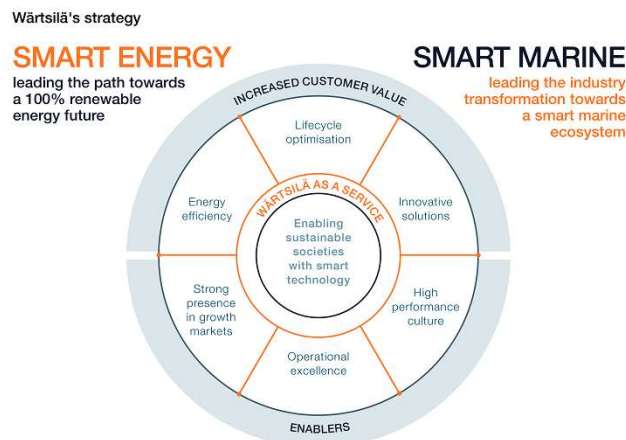
2 The Company Wärtsilä in brief

This chapter will unmask the company Oy Wärtsilä Ab and its business strategy, the characterization of a project within Wärtsilä Energy Business, categories and project types. Finally, an introduction to the profession of a Project Engineer Mechanical and hers/his work tools will be presented. This is the cause of having the reader to get a sight and closer understanding for the profession and its nature.

2.1 Oy Wärtsilä Ab

The history of the corporation Wärtsilä reaches back to year 1834, in a Finnish small town in the province of Karelia called Tohmajärvi, where the company was established. From a small-scale company in the sawmilling business, Wärtsilä has grown and transformed into one of the competing global leaders in providing smart technologies and complete lifecycle energy solutions in energy - and marine markets. As of October 2019, the company business strategy got integrated from Energy Solutions, Marine Solutions and Services into Energy Business and Marine Business. Today the company employs over 19 000 people in over 80 countries and occupies a value of approximately 5.2 million euros in net sale. The sectioning of the company's personnel around the world are 20% located in Finland, 40% elsewhere in Europe, 24% in Asia, 11% in America and in other 4% are represented in other countries.

Wärtsilä endeavors for sustainable solutions by providing high-quality products and services. This all is to achieve and enable the goal of “sustainable societies with smart technology”. (Wärtsilä, 2019)



(Figure 1. Wärtsilä,2019)

2.2 Marine Business

The first segment of Wärtsilä's business strategy is Marine Business, which is a world leader in marine technology. Besides being on top of the world, Marine Business offers innovative products and integrated solutions that are both environmentally and economically sustainable, flexible, efficient and last but not least safe. With know-how, experience and not to forget their dedicated personnel, Marine Business are able to fulfill whatever offshore application the customer needs.

In year 2018, the Marine Solutions reached a value of 1,232 million in net sales and 1,710 million in order intake. (Wärtsilä, 2019).

2.3 Energy Business

The second segment of the company is Energy Business. This field of Business is a global leading supplier of flexible powerplants and offers solutions from power generation facility to turnkey delivered power plants. The flexible design, high efficiency and low emission levels is what characterize the power plants of Wärtsilä. For the future, Wärtsilä envisions a 100% renewable energy concept with the following statement quoted below:

“The revolution of renewables has started. The energy systems are changing towards 100% renewables and we at Wärtsilä can make it happen through technology and innovation”

In the year of 2018, Energy Solutions achieved a net sale of 1,517 million and an order intake of 3,086 million euros and today Energy Business has 70 GW of power plant capacity in 177 countries around the globe. (Wärtsilä, 2019).

2.4 Engineering

Engineering is a department within in the segment of Energy Business. This department is divided into: Sales Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, Process Design, Development Engineering, Technical Expertise and Project Quality & Documentation.

2.5 Characterization of a project within Wärtsilä Energy Business

The definition of a project is a temporary set of activities undertaken to create a unique product, service, or result. What characterizes a project is by defining the beginning and end points, have specific goals and a unique end-product. (Compass,2019)

In Wärtsilä Energy Business all projects have been divided into three different categories, under each of which there are several different project types. The project categories are the following:

Customer Delivery Projects (CD)

Operational Development Projects (OD) and Product and Solution Development Projects (PSD).

CD is a category and the project ideas are coming from the customer needs. Wärtsilä gets a request for a quotation from a customer or otherwise notices a customer need that has to be met. Within the CD, Wärtsilä Energy Business will lead, manage and execute projects for power plant customers. By using alternative contract types, Wärtsilä Energy Business can offer a variety of project management service packages. The main scope packages for today are:

Basic EEQ (engineered equipment delivery) is a project type that includes Engineering, procurement, logistic and commissioning.

Extended EEQ (extended engineered equipment delivery) is a project type that includes detailed engineering, procurement, equipment and material delivery and logistic.

Process EPC (EPC above floor level) is project type that includes detailed engineering, procurement such as equipment and material delivery, logistics and installation above floor level.

EPC (Engineering, procurement, construction) is a project type that includes detailed engineering, procurement such as equipment and material delivery, logistics and construction. Practically this means that the seller hands over a key to a complete working power plant to the customer.

EPCM = Engineering, procurement and construction management, is the latest project type and function as a service only contract, which means that the contractor performs engineering, procurement and construction management services.

OD and PSD, is a category where the project owner initiates the project / suggest initiation to project portfolio management. The project owner is the person who is most interested in utilizing the business benefits of the project. (Compass, 2019).

Project Class

The projects are classified according to the ABC method. This classification method will analyze the challenges in a project according to its complexity and significance. Practically this indicates on how much project management effort is needed. ABC is defined according to:

A = Very complex and/or significant project

B = Normal project

C = Simple or straightforward project

(Compass,2019)

2.6 Project Phases

Wärtsilä is handling its project by dividing it into phases or, within the company the phases are called Gates (G). Gates are obligatory decision points in the project management and are either GO or NO GO, depending on if the project should continue in a certain direction or not.

Gates that are common to all projects:

1. G0 Start project
2. G1 Start Planning
3. G2 Start Execution
4. G3 Start Closing
5. G4 Close Project

Start project G0

G0 is a decision to approve a project idea. Before the decision is made the project has been classified according to the ABC method. The G0 decision is based on a written proposal. The approval will start the Initiating Phase.

Initiating Phase

The initiating phase includes the preparation work that the project sales organization does e.g. preparing contracts, reading the request for a proposal, analyzing opportunities. Depending on the prospect this phase might require only light preparation work or a heavier approach e.g. discussions with the customer etc. As a result of this phase it might even be decided that the prospect project is so big that even the sales phase needs to be done as a separate project.

Start Planning, G1

G1 is a decision to offer. The project owner or portfolio management board/business management makes the G1 decision (go/no-go). The G1 decision is based on the written Project Charter. Approval of the Project Charter in G1 (go) starts the planning phase.

Planning Phase

An offer is prepared in this phase by the sales organization. The project management level supports the sales organization by doing initial project planning, such as calculating the amount of work, material and time needed and the cost of the project. The most important objective of this phase is to close the deal considering a reasonable risk level. In A class projects the project manager has been nominated already in G1. In B and C class projects, the project manager might be nominated very close to the G2 decision. However, the nomination for each project should be done early enough to ensure that project management can still affect the terms and conditions before closing the deal. From the project management point of view the objective of this phase is to plan the project. The Project Plan includes all the necessary information about what deliverables should be ready when the project is closed, how the project will be executed and what are the acceptance criteria and process. The project manager is responsible for ensuring that the Project Plan is done.

The project owner is responsible for assembling and assigning the internal steering committee (if assembled). The customer is responsible for assigning its representatives to the common steering committee (if assembled).

Execution Phase, G2

When the project plan is approved, starts the execution phase. In this phase is the project manager and the project team responsible for ensuring that all tasks and activities described in

the project plan executed. During the execution phase, the progress of the project activities is monitored and compared to the project plan. (Compass, 2019).

Closing Phase, G3

G3 is a decision to approve project deliverables and start project closing. When the acceptance criteria for the project deliverables (defined in the Project Plan) have been fulfilled, the project manager makes a proposal to approve the project deliverables.

Closing project, G4

G4 is a decision to close the project. The G4 decision is based on the written Final Report and it can be made when the closing actions have been finalized e.g. utilization of the project outcome and further responsibilities have been agreed. Project closing means that all the activities related to finalizing the project deliverables and handing them over, as well as administrative tasks, have been completed. (Compass, 2019).

2.7 Project Engineer Mechanical

As mentioned above, the Project Engineer Mechanical position is within the Engineering department. As for today, twenty-five people in total are employed for this position and twenty-three of them are based in Finland as the two of the rest are based in India. Usually, the PEs are assigned to two or three teams, which consist of a PM (Project Manager), CPE Mechanical (Chief Project), CPE Electrical (Chief Project) and a Project Controller. The assignment of the Project Engineer is depending on the scope in the projects, type of customer, project complexity, maturity level of the project team etc. The average workload per PE Mechanical is five to eight projects and if the Project Engineer is overloaded other Project Engineers can help due to the difficulty to get an even distributed workload for everybody.

The typical daily work for a Project Engineer Mechanical consists of making purchase specifications, purchase requisitions, bill of quantities and design packages as instructed by the CPE mechanicals and PMs. As well to check and negotiate the sub supplier's design in respect of contract and design directive compliance. To give feedback regarding standard and project specific solutions to respective responsibility parties. To create and select units and modules according to the technical specification and insert units' drawings into the documentation database. Supporting the CPE via creating the design together with a third party, participate in

meetings and as well courier services which can be to travel to site around the world with urgently needed parts.

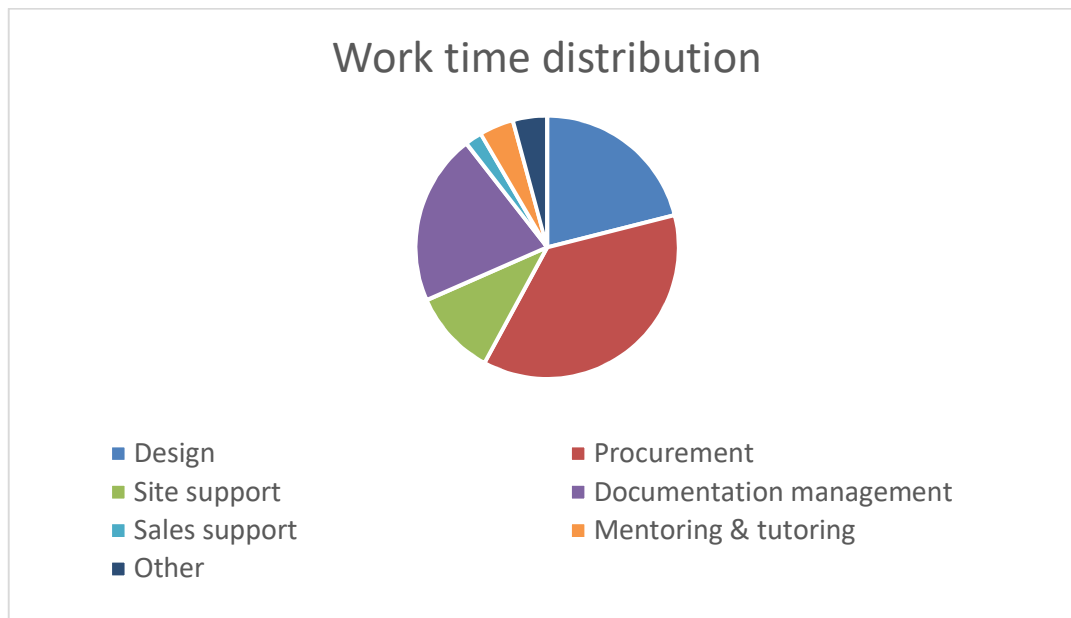


Figure 2. Pie chart over the work time distribution of a project engineer mechanical (Wärtsilä IDM, 2014)

2.8 The work tools of a Project Engineer Mechanical

As describing in chapter “2.5 The daily work of a Project Engineer Mechanical” the daily work is varying day to day and the scope of work tools can be wide and varying depending on what tasks he/she has to tackle. Hereunder, the most common used work tools will be presented:

Compass

As within larger companies, corporations and organizations, intranet is being used and functioning as a private computer network for its users. The intranet is built and docked by different kinds of local networks within the user’s group, protected from the outside world. Within the intranet, you as a user can access and share information and servers, as well allows people to communicate with others in the organization. (Wikipedia 2019)

Within Wärtsilä the intranet is named Compass. In Compass the wärtsiliän (employee of Wärtsilä) will find everything from local company news, lunch lists to power plants support tools. (Compass, 2019)

SAP

SAP is a German multinational software corporation and is the shortening of System, Applications & Product in Data Processing. As a Project Engineer Mechanical this system is used daily and the most. With this program the Project Engineer Mechanical can do the procurement, documentation and check the cost follow up for the project, the status of items that can be bought within Wärtsilä, display previous purchase orders and finding engine spare parts etc.

IDM & M-Files

IDM works as the company's intern server-based network where everything from training documentation to customer contracts to technical specification for a specific steam turbine etc. Under this system every project related documentation will be uploaded and stored. The Project Engineer mechanical will among other things upload the documentation received from the sub-suppliers etc.

3 Theory

In this chapter will the theoretical framework of the thesis be presented. This will help the reader to get a hang of the aim, the method and the results. Hereunder will the theory behind the systematic approach to writing and updating guides, manuals and user documentation be decomposed.

The definition of the word instruction is a detailed information on how to do or use something. This is an act of educating, instructing and giving the steps of information or knowledge that requires to be followed. (Yourdictionary, 2019). The main purpose of the instruction is to help the user in the best and most safety way to create, program and execute something. (Skolverket, u.d.) In fact, they function as well for the companies as product liability documents, instructions and marketing and public relations tools. (Robinson, P.A.,& Etter, R., 2000.) Moreover, the guide has to overcome the user's trepidation through building confidence and deliver easy-to-follow instructions (Grimm, 1982, 1-3) and apart from the textbooks, where the reader reads page by page, manual's or instruction's readers are reading more in a random manner. (Weiss, 1985) Therefore, obtaining the background information and planning the manual is of great importance. (Grimm, 1982, 1-3)

3.1 Who should create the manual?

The creation of a manual in companies are usually done by a team or just a solo writer, depending on its size. Writing manuals as a solo writer has both advantages and disadvantages alike. The advantages are that the writer has many opportunities to be creative and making all of the decision. The solo writers often enjoy having control over the project from the beginning to the end. The disadvantages, on the other hand, are that the writers will be the only link between the system and the users, and they tend to feel isolated, rushed because of burden of all the responsibility. (Robinson, P.A.,& Etter, R., 2000). Writing documentation in a data processing atmosphere, the writer is acting as an in-between the system and its human users (John Wiley, 1986) and the writers' role is to write clear instructions. Hence, manuals and instruction are much greater than just words and picture on a page, it increases the value of the product and the company. (Robinson, P.A.,& Etter, R., 2000.) However, before the writing and creating the manual can begin, there are some stages that needs to be completed.

3.2 Preparation before writing

Understand the users

“The most important ingredient in the process of developing manuals is the users.” (Grimm)

First of all, comes the definition of the users. Once the writer knows about the target group, he/she needs to harness the users’ needs in order for the system to be used effectively and correctly. The best way of having this done is to talk to the users through verbal and non-verbal communication. (Grimm, 1982, 24-30) The mindset of a user is furthermore required during the creation, so the content will be as accurate as possible. (Online-learning, 2019). Therefore, knowing the audience, helps the writer to decide the tone and level of technicality of language, how deep the concepts need to be explained and the analogies that can be used. The following questions are important to know about the intended users:

-Which computer packages are they familiar with?

-What are the obstacles they usually experience while using these software applications?

-What is their current level of expertise in using the applications?
(beginner/intermediate/expert) (Shed, D.,2008)

The unwritten goal or hope of the instruction or guide is to help the users and not having them to feel stupid while using it. The users’ need of feeling confident shall not be underestimated. Anxiety can be triggered when too much options are mixed with too complex technologies. If they cannot figure out on how to do it, the users are often blaming themselves and doubting their own competence. According to the Schriver’s analysis on people who uses instruction and fail, 50 % of the time the users are blaming themselves for a problem they experienced and only blaming the instruction 30% of the time. This tends to get the user to feel incompetent both as readers and users of technology. Therefore, when creating the instruction, the human user must be considered, not the computer. (Robinson, P.A.,& Etter, R., 2000).

The average reader will not probably read the manual from the beginning to end. Frist, she/he reads the index or the table of contents and once the right topic is found, the page is skim through until the information needed is found. User manuals is not novels; therefore, the user has to quickly be able to find the information needed in order for she/he to go back to whatever she/he was doing. (Shed, D., 2019). By that reason, manuals aimed at a certain profession are often easier to create compering with more general manuals as the writer can do certain

assumptions about the user's understanding based on the information about the profession. Even if the technical language and the visuals can be used more in guides aimed for certain professions, it still has to be as clear and logical as it was written to the public audience. (Robinson, P.A., & Etter, R., 2000).

Where will the instruction be read? Who is going to read it? What kind of pre knowledge do you have to have in the instructed subject? (Skolverket, u.d). All in all, the definition of the users shall be done in the early stage of the process. Important to remember is to define the level of familiarity about what the instruction is going to be about as well. (Pressbook, u.d). By analyzing the audience helps to determine the scope, vocabulary, tone, the level of experience and knowledge. How familiar are audience with the systems or programs? The educational level will form the audience description here. (Denton L., Kelly J., 1993 17-26)

Understand the system

For accurate and easily understandable instructions, the writer must thoroughly know what kind of task or system should be used. Lack of knowledge can be misleading and can even be dangerous. (Bursaw, A., 1997). To determine how much to tell the user, compare your knowledge of the system with the other users. Take time to choose accurately what parts of the system that should be included and to harness the needs of the users' and the best way to understand the user is becoming one yourself. (Grimm, 1982, 9-23)

Gather information

First, decide what kind of manual best suits the purpose is a key. Is the purpose an explanation to teach people on how to use the system? Is the purpose to be as a reference when the need arises? Or is the purpose a combination of both? (Grimm, 1982, 37-40). When the information is gathered, it is time to decide if there will be any kind of tool to perform the instruction? (Skolverket, u.d). One of the best ways is to gather data and analyze it, by interviewing potential users and distributing questionnaires to learn as much as possible. (Denton L., Kelly J., 1993 17-26).

Training Manual

If the main target with the manual is to instruct, then it is a training manual. The training manual varies from simple ideas to complex ideas to build the readers understanding. The user will be introduced to the system and the responsibilities. For this kind of manual, the writer has to know

nothing about the system from before, therefore it should be explained in a logical and simple way. The users should be tested, and their success should be measured in a way. (Grimm, 1982, 37-40)

Reference Manual

The reference manual is a collection of information where the user can easily and quickly find the specific information needed. Since this type of manual cannot be expected to be read page by page, from beginning to the end, some information tends to be unread. Therefore, the importance of completed section is high prioritized. Except, the new employees should read it from cover to cover. (Grimm, 1982, 37-40).

Organize it

By organizing all the information, the manual's contents will be clearer and more accessible. The information can be organized:

1. Most important ideas or items
2. Information the user needs most often
3. Start with simpler concepts and then move on to more advanced
4. Steps or events should come in chronological order
5. Divide a complex subject into its main parts and explain them
6. Order the topics by system or task etc. (Grimm, 1982)

When developing the structure of the manual the writer should imagine the reader as someone that is walking around in a new city. Vision it like a map with street signs and landmarks that help the reader to find their way around or as a highway with many exit and entry points. (Robinson, P.A., & Etter, R., 2000.) Some companies use the "The person on the street" method, where they invite random people from the street to have a walk through the manual. If the writer has to break in to explain something more fully it indicates that the manual probably needs to be revised or some explaining clarification. (Robinson, P.A., & Etter, R., 2000.)

3.3 Create

After all of the preparation and gathering of the background information, the next step for the writer is to begin with the creation of the instructions. The creation of the manual shall not be started too early. The writer's mind must be clear about knowing the system, how it will be done and what information to be used. (Grimm, 1982, 68)

To enhance the readers understanding the writer should use and consider the following information:

The right style

To achieve a well-written manual, the writer should express hers/his ideas in a simple and clear way. Forget the style of all fancy use of language and write and express the information in simple words and sentences. For example:

Why Use:	When You Can Use:
Utilize	Use
Terminate	End
Numerous	Many
Modify	Change

The words must mean the same thing for every reader and taken from the "every-day words". Long words shall be replaced with short words. Same as follows for different kind of expressions, such as:

Why Use:	When You Can Use:
At the present time	Now
Maximum quantity	Most
Minimum quantity	Least
Due to the fact	Since
A major portion of	Most

The point is to use the fewest and shortest words possible, since the user needs to figure out and understand what she/he will do in fastest way possible. The best words will be chosen if the writer thinks in a conversational style (write the way of talking), consistent word use and capitalization and careful abbreviations instead of computer jargon. The writer should also use contractions (but not when emphasizing a point), ask questions by “talking to the reader”, use short sentences, eliminate word such as “which and that”. Slang has no place in the manual and avoid using synonyms, since the reader can think it directs on different things. Clichés and idioms should not be avoided, since they can be the clearest way to get said exactly what meant. Acronyms should be used repeatedly, since the computer language is full of it and therefore useful for the reader to be learned. But then again only the terms the user must know should be included and the explanation of them. (Grimm, 1982, 71-78)

Accurate words that promote clarity shall be used, for example: “Select a time” should be written instead to “Click on a time”. Writing double negatives such as “That won’t do no good” and so on shall be avoided. (understandinggraphics, u.d)

The way to write

When writing for only one audience the tone should be set by speaking directly to them by starting the sentences with the verb. The “voice” in grammar is the relationship between the subject and the verb. For more effective writing, the active voice is recommended. The writer can also start the sentence with the subject, verb and finally the direct object. For example: “The engineer completes the inputs form”. (Grimm, 1982, 79-84) . Do not make the readers yawn by writing with a passive voice, instead an active voice will make the users to take action. (Understandinggraphics, u.d). Furthermore, to catch the reader’s attention, reduce the bulk of text to the shortest and need-to-know information is important and if it’s possible, use visuals, charts, graphs, process flows to replace the text with. Go for the verb and use an active-voice “verb the text”. Go vertical instead of horizontal, make lists and more lists. By arrange the lists by numbering it, makes it easier for the users to keep their place. (Robinson, P.A.,& Etter, R., 2000.) To increase the understanding of which instructions belong together, the spacing between the sentences should be placed so it shows enough legibility and the association between the sentences. (Understandinggraphics, u.d). Moreover, connectives such as “and”, “or”, “but”, “however”, “likewise” etc. should be used carefully to connect the ideas. Make sure that they are correct, or the instruction will be misleading. Use commas to set apart phrases, expressions and words. They should not be used to separate the ideas. (Grimm, 1982, 85-91)

In general, by planning the information package in both text and graphics from the beginning will result in a more effective manual. (Robinson, P.A., & Etter, R., 2000.). Reminding the users with the vital information is essential, since the users tends to skip back and forth through the sections. Reflect over following checklist: (Robinson, P.A., & Etter, R., 2000.)

- Have I identified what's important — from the user's point of view?
- Have I focused on need-to-know information?
- Have I repeated important information?
- Have I given cues, such as a table of contents, headings, overviews and summaries, and transitions, to help readers find their way through the manual?
- Have I made it easy for the user to skip around in the manual?
- Have I presented sections in easy-to-use modules?
- Have I ordered the sections in a logical sequence?
- Have I reduced the amount of text — by going visual, vertical, and for the verb — wherever possible?
- Have I used many graphics?
- Have I warned of safety issues before the hazardous step?
- Have I answered the user's questions?

(Figure 3, Checklist from Robinson, P.A., & Etter, R., 2000.)

Sectioning of the manual

When writing instruction to one user, it can be organized as the cookbook style or numbered instruction style. (Grimm, 1982). Barley anyone reads the manual from beginning to end. The reader wants to find particular information. Likewise, in a cookbook the user maybe wants to know how to particular make a chocolate cake without read through basic cooking techniques, guidelines for good nutrition and how to equip the right cooking equipment. In addition, the manual has to be easy for the company to revise and adapt as needed. (Robinson, P.A., & Etter, R., 2000.)

The typical style of sectioning of the manual can look according to the hierarchy style by numbers divided by periods:

1.0 Chapter One

1.1 First Subtopic

1.2 Second Subtopic

1.2.1 First Sub-Subtopic

1.2.2 Second Sub-Subtopic

2.0 Chapter Two .. and so on.

The reader's first impression of the manual will determine everything, therefore it is important that it looks easy to read. If the manual looks hard to read, the reader will put the manual immediately away, likely to never be used again. (Robinson, P.A., & Etter, R., 2000.) One tip is to use numbering or bullets to split and simplify the information (Shed, 2008). To clarify the instructions, create a list and number it in a logical way where the user can recognize the task. (Richard Nordquist, 2019)

When writing a manual to a company, it must be written in a way that it is easy to update with new information and easy to be combined with other manuals. The old standard format can be taken from older company manuals, this will help the employees within the company. If the writer changes the standard, the design of it must be chosen carefully so it can serve the company effectively for a long time. (Robinson, P.A., & Etter, R., 2000.)

Why Use Graphics?

For the common user's first impression of the manual, graphics plays the biggest role. By providing clear drawings, tables, charts and photographs will tell the user that the manual is not an afterthought. Why are the graphics so important?

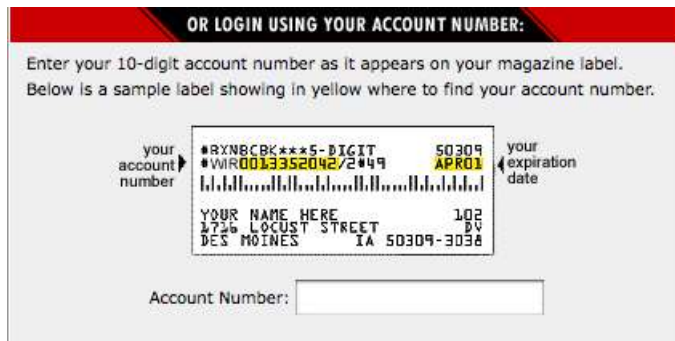
- 1.They attract the eye.
- 2.They convey some information better than prose.
- 3.They facilitate translation.
- 4.They describe actions.

Readable graphics shall be used from the beginning of the manual design to reach higher effectiveness. (Robinson, P.A., & Etter, R., 2000.)

By the usage of pictures, schematics and flow diagrams will increase the efficacy of the document. (Shed, 2008)

Creating the instructions in a wordless way (by pictures and symbols) is more effective and will speak out easier to an international audience. (Richard Nordquist, 2019)

Some things are closely to impossible to describe in words and sentences. Therefore, by using graphics makes the text comprehensible and provides support to the users. An example of this:



(Understandinggraphics, u.d)

When writing input instructions, combine the graphics with examples as well for making the tasks clearer. By following the checklist:

1. Make the instruction appropriate to the type of data entry.
 - a. Batch
 - b. Online
 - c. Real-time
2. Use step-by-step instruction method based on the order of the input form, prompting messages, or input file.
3. Provide input examples. (Grimm, 1982, 98-105)

3.4 Response, correction and review

Before finishing a manual, ask a test audience to give response on the manual and adapt the feedback to the content of the manual (Skolverket, u.d). Try if the instructions are understandable through an audience that is meant to use it, if it's not possible, try it through other random audience. (iklartext.se, u.d) The goal is to increase the clarity of the manual before

finishing it, this can be done by having an unfamiliar person read the manual and point out the things that are unclear or wrong and need to be changed. (Grimm, 1982, 155-159)

Before finishing the manual, it should be reviewed by the company's personnel that are familiar with the systems. This can be done by follow following checklist:

1. Determine the reviewers.
2. Have review procedures.
3. Put the reviewer's name on the draft.
4. Ask for its return by a specific date.
5. Consolidate changes when all drafts are returned.
6. Mark changes with change bars.
7. Return first draft with second draft to all reviewers.
8. Repeat the process until all are satisfied.
9. Sign-off on the manual.

(Grimm, 1982, 161-165)

Try to find different persons to review the documentation from a technical, management, editorial and user perspective. (Brockmann R.John, 1986, 160-165). Note down the difficulties that arise when the instruction is tested on a sample audience. Revise the instruction and repeat the process until the audience will accomplish the task without any problems. (Understandinggraphics, u.d). Further on people can be invited to test the instructions and observe the progress if all steps are accomplished correctly and in a reasonable amount of time. If there are complications, the instruction shall be improved. (Richard Nordquist, 2019). If the instructions are not tested on the intended beginner's audience will the sample not be representative. (Wikibooks, u.d)

3.5 Why are users not reading the manual?

The users of the manual rather learn by their mistakes than using the manual. The three reasons why are:

Manuals are complicated to use

According to a research, the users will get frustrated because of the complication to navigate and find the right information. The creators of the manual have the wrong assumptions about what the users really need by irrelevant information and the terminology is confusing and inconsistent. (Helppier, u.d)

The majority of the user's opinion of manuals is that they are complicated and horribly written due to the fact that they are written by the engineers and lawyers for the manufacturer not for the users. Even if they are simple and well written, they may not be entertaining enough for the user of today. (Washington Post, 2002)

Users gets confused by new words and concepts. The writers write too long texts to attempt to cover everything and make sure that the users are on the same page. Too long texts tend to scare off the users. (GetOpenSocial, u.d)

Users are impatient

“People try things out, think them through and try to relate what they already know to what is going on” (Retting, 1991)

Mental models are working as a cognitive mechanism for the humans and are generalized thought processes on how things work in the real world. Meaning, the mental models will be applied into new situations and tasks so it does not have to be re-learned. (Understandinggraphics, u.d). The users are only turning to the manual when the instructions don't meet the expectations and they get really stuck. The users acquire understanding through real actions. Therefore, the users prefer to learn by mistakes which leads to they skip the manuals and go straight to using it. (Helppier, u.d). The users are too impatient and it is too time-consuming to read the manual. (Washington Post, 2002). People are lazy and thinks most of it can be solved by common sense. This will limit the users to achieve the goal of the product. (GetOpenSocial.com, u.d)

Lack of availability

According to a study, manuals are either difficult to access or not available at all when the user needs it. (Helppier, u.d)

A study done by The University of Texas at El Paso (2006) named “Why don’t people read the manual?” tested if there were any differences between a printed version of a manual or an online version. They found that the printed version got 9 positive and 61 negative answers while the online version got 41 positive and 22 negative opinions. The printed versions were to physically hard to handle, navigate, understand and too basic to be useful, unstylish and boring. On the other hand, the online versions were seen as more helpful, searchable, and easy to use. (Medium, u.d).

All in all, to consider in what format the manual should be published in, can increase the usage of it. Moreover, it is important you do not try to impress the reader by using technical jargon that the common user do not understand, this will only lead to that the user thinks that the manual is boring. Instead, terms that the user is familiar should be used. Further, the manual can be spiced up with images or even a short video demonstration to explain a complex task. Have in mind that the technical knowledge between the users can differ a lot. The users that have some knowledge tend to turn to a colleague or customer support for help and may read the manual, therefore the users with less knowledge will more likely read the manual. With that in mind, don’t overestimate the technical abilities of the users. (Helpauthoringsoftware, u.d)

By writing the manual in a more personal way will give the users a more pleasant and humorous experience. Make sure that the between-the-lines message will not put-down the user instead up-lift them. An example of this between the line message:



FORGOT YOUR PASSWORD?

Oh no! Well, we've all been here at one point or another. Just enter your username or email address and we'll email you instructions to set up a new one.

Username or e-mail address: *

(Picture 2, understandinggraphics, u.d)

"Instructions can be either freestanding documents or part of another document. In either case, the most common error is to make them too complicated for the audience. Carefully consider the technical level of your readers. Use white space, graphics, and other design elements to make the instructions appealing." (William Sanborn Pfeiffer, *Pocket Guide to Technical Communication*, 4th ed. Pearson, 2007)

3.6 Implementation of a new employee

A major amount of money and time is spent by companies to technically train the employee. The teaching and the training for the new employee must be done in a proper way to achieve effectiveness. The teaching and the training will give the employee an introduction to the organization and more commitment and job-satisfaction which are important factors. According to research, new employee orientation programs results in increased knowledge, abilities and skills for the new employee. (Researchgate, u.d)

"We never get a second chance to make a first impression". The treatment of a new employee during the first month with the company has a major impact on hers/his motivation and future career aspirations with the company. In Wärtsilä, the receiving of a new employee is split up into following sections:

1. Planning the induction

This section starts immediately after finalizing the recruitment process. Planning well in advance is the key for a smooth start. The planning is done by making individual induction plan, finalizing the position description of the employee, arranging a workstation, PC, name tags, business cards, phone, and office equipment. If it seems to be needed, a tutor or mentor is appointed to the new employee. (Compass, 2019)

2. Start of employment

Along with the first day of employment for the new employee starts the induction period. This will include: meeting and welcoming the employee, induction of the department, the colleagues, workplace, facilities, work procedures, tools, safety routines, regulations, key persons and finalizing the employment contract with system IDs. As well providing the new employee with a health inspection and a discussion of development. (Compass, 2019)

3. General Wärtsilä induction

The general Wärtsilä induction courses is the local human resource department responsible for arranging. In this course will the Wärtsilä's vision, mission, strategy and values will be presented. Apart from that, the employee must accomplish the code of conduct and anti-corruption courses, which are mandatory. The employee will also have the opportunity to get familiar with a small introduction to the market and with a customer focus. Apart from that to the local company, internal security, information management and to a newcomer's community. (Compass, 2019)

4. Business related information

Each business is accountable for defining and delivering the business specific content for employees joining their business. The following topics will be presented to the newcomer:

Business environment; Our reason for being in business.

The business mission, strategy and strategic roadmap.

The business offering, products and solutions.

The way of working, organization, business specific guidelines, tools, systems and process. (Compass, 2019)

5. Template for individual induction plan

An individual template is used and filled in for the newcomers and handed over to the human resource department:

Newcomer information	
Name:	
Position:	
Organisation:	
Line Manager:	

Start date of the induction period:	
End date of the induction period:	
Summary of hours used for the Individual Induction check list (excluding eLearning & training hours as those are recorded separately under the training history in Saba)	
Section	Summary of hours used per section
"2. Start of employment"	
"3. General Wärtsilä Induction"	
"4. Business specific induction"	
"5. Individual induction plan"	
Total hours used to complete "Individual Induction Process checklist"	
Date:	
_____	_____
Newcomer's signature signature	Line Manager's

(Compass, 2019)

According to the plan, the induction should be completed within six months from the starting date. (Compass, 2019)

Mentor

Another way for the employee to be implemented into the work is by mentorship. Mentorship is a method which purpose is to mediate the knowledge of experience and wisdom to a younger, less experienced adept. The goal is to get the person who is going to be tutored to better handle his or her career and profession. A mentor is a person who partners with a new employee during his or hers first months of employment. (blogs.helsinki, u.d). Wärtsilä offers mentorship for the new employee, which will support the individual development of both the mentor and the mentee in a confidential setting. Each mentor and mentee bring a unique mix of experiences to this program, which offers systematic way to increase knowledge sharing and develop skill and expertise. (Compass, 2017)

4 Method

This chapter will present the method used for creating the instructions and the work split for the Project Engineer Mechanical. For each solution have meetings with the supervisor has been held and interviews been conducted from the Project Engineers Mechanical within Wärtsilä. To start this chapter, qualitative research, semi-structured interviews and interviewing via e-mail will be presented in brief, followed by the way of gathering data.

4.1 Qualitative Research

To get to the root of the problem and to find what kind of guidance is needed and to be created, has a qualitative research been done with the people in the position of Project Engineer Mechanical.

Qualitative research is one way of collecting empiric data and consists of several methods such as interviews, observations, narratives, pictures and focus groups discussions. When having a qualitative research approach, the research questions often are about exploring the experiences of people, presenting a specific group. The common things that characterize qualitative research are:

- Qualitative data in pictures and words, not figures
- Natural data through observations and unstructured interviews
- Purpose in front of action
- Inductive hypothesis generating research rather than hypothesis-testing

(Ryen A., 2004, 14-17)

An interview is an exchange with opinions between two people who are speaking about a theme of interest by the researcher. To use an interview as research method is not mysterious due to the fact that an interview is a conversation with a structure and purpose. The interviewer introduces the subject for the interview, followed by questions and follow up questions. (Kvale S., Brinkmann S., 2009 17-19).

A qualitative research methodology has been chosen for this thesis. The data has been collected through semi-structured interviews and e-mail interviews. Semi- structured interviews were

seen as the most appropriate method for this thesis, as the aim is to identify the challenges in the daily work of a Project Engineer and further explore the views of work split between the Project Engineer and the Chief Project Engineer.

4.2 Semi-structured interviews

Semi-structured interviews are an interviewing method where the questions are predetermined, and each question is asked to the interviewed person in a made-up order. You choose on your own follow-up question on basis of the answers of the interviewed person, not the answer you want the interviewed person to tell. Each of the interviewed persons will get the same main questions and are therefore treated equally. The interview is then being formed after the answers of the interview, which will make the interview unique in one way. (Academicwork, u.d).

The semi-structured interviews were conducted in Wärtasiläs office in Runsor. An interview guide was prepared before the interviews were conducted.

4.3 E-mail interview

Since some of the target groups were located in different geographical areas, has interviewing via e-mail been chosen as an additional method to collect the data. A computer supported interview can be done via e-mail where the interviewer writes and waits for the answers. One opportunity with the computer supported interview is that the answers are being written and therefore ready for analysis, there is no need for transcribing. On the other hand, there are drawbacks that both interviewer and interviewed needs to be aware of. As both needs to be decent in expressing themselves in writing, and the text are more difficult to analysis when body nor colloquial language are used. However, a limitation is that it can be hard to get rich and detailed answers. (Kvale S., Brinkmann S., 2009 165-166).

Interviewing via e-mail is cost efficient and the geographical reach is greater. The data is requiring slight editing and formatting for the process of analysis. This method is more efficient and enables to get better answers from people that are shy, people that cannot express themselves as great by talking as they do by writing and people who are being interviewed in their second language. But on the other hand, there are people who express themselves better by face to face interviews. Not to forget, by using this kind of method, an interview group that otherwise would be excluded from the research can be included in the study. The downsides

are that the body language, eye contact, voice tones and facial expression will be missed. (Lokman I. Meho, 2005).

4.4 Planning and gathering information

This guidance and works-split's main target group is the Project Engineer, Mechanical for Power Plants. The quite narrow target group of the thesis was chosen due to that there are other departments with Project Engineers that have different tasks and a whole different way of working within the company and the guiding is therefore not applicable to these areas.

The gathering of information started in mid of October 2019. Interview questions were sent out via e-mail to eight of the trainees of summer 2019. This group of people were chosen due to the fact that many of them were newcomers and still had a fresh memory on how it is to be new and what issues there were in the daily work. The interview via e-mail method were chosen due to many of them had moved back to their study locations around Finland and therefore hard to reach and meet in person. The ages for the interview persons were from 21 – 26 years old. All of the persons being interviewed, had an engineering background and the majority of the group had worked two summers. The rest had worked only one summer as a trainee on the Project Engineer, Mechanical position. From the eight email interview requests that were sent out, seven persons answered participated. The answers varied from compendious sentences to copious sentences, but overall the issues they had struggled with were almost the same in all of the interviews.

Later in mid of November 2019, the semi-structured interviews were held. Before the interviews were held, the questions were prepared to get the conversation going. The questions were not too detailed, so the conversation flowed relatively freely. The group that was chosen for this kind of interview method were the full-time employees, due to many of them are stationed in Vaasa. Since there were some issues with the full-time employees being laid off, due to re-organization within the company the willingness to participate in the interviews was affected resulting in that only five interviews were recorded and conducted. Within this target group the age span was between 26 – 35 years old. Everyone came from a background of engineering and had worked in this position for two to three years. Most of the answers were similar to each other, but some were a little bit off-track and more focused on what issues there might be within the design of a power plant.

With the answers conducted in the baggage, the planning of the results took off. To get started with the planning of the manual and analyzing the results of the study, weekly meetings were held from January 2020 with the supervisor Anders Ahlqvist from Wärtsilä. In these meetings all the different phases of a project were peeled off. Starting off with the Sales and Planning phase to the Commissioning phase, thinking of every possible task a Project Engineer, Mechanical could stumble on. From there we found out if there were any kind of instructions to manage the tasks, if there were, are they up to date? If there were not, an instruction was created for it.

4.5 Choice of platform

Since the work-split demands that each have different task and responsibility distributed to either the Project Engineer, the Chief Project Engineer or the third party, Microsoft Excel became the most natural choice of platform.

The guides and instructions were first created in Microsoft Power Point, due to the practicality of design. After the guides were created and edited, they were formatted into PDFs.

4.6 Creating the work-split and the instructions

According from the data from the qualitative research, many suggested that one effective way to create the work-split is to divide the work tasks on basis on the time schedule of a project. Hence, the work-split was created on basis of a project's timeline and the missing guides were created. Existing guides were linked to the different stages of the time schedule. The result and the scope for this work-split emerged from the weekly meetings with the supervisor. To keep the work-split simple and clean, each different task needed to be categorized into the different phases in an unfold feature. To create the unfold feature in Excel, VBA (Visual Basic Application) needed to be done. To simplify it even more, three different sheets where created. The first one with a general split, the second according to a basic project's timeline and the third where every instruction, inquiry sheet and tip were listed.

The guides and instruction were created based on the theory, and to keep everything unified, the background of the old instructions/guides were kept.

Beside the work-split and the guides, an e-mail with useful links, information and needful accesses has been composed to the new employees. This was created with the assistant of engineering.

5 Results

In this chapter the results of the thesis will be presented. The function and layout of the work-split and samples of the guide will be presented and explained.

5.1 Instructions

According to the data from both the e-mail and semi-structured interviews, came the idea on what guides needed to be updated and what to create from scratch. Some of the existing guides were created back in year 2014 and others further back. Since then have many of the programs been updated.

Before beginning with the creation, the existing guides were needed to be found and checked on what kind of information has been changed and if the way of working was correct. Before knowing that, the programs mostly IDM and SAP had to be learned and mastered.

After the different kinds of program were learned and mastered, the creation of the instructions started in the beginning of December 2019 . I began the updating of the existing guides. This was executed through doing the same task as the existing guides told. Followed step-by-step and noticed myself that this needed to be updated due to old information and not even every single step was told. With the mind-set that the theory had told and the guidance should be so simple and profound as that you can take any person from the street and have her/him to accomplish the task. I started the different kind of task from the beginning and documented every possible step on how to do it and added even more additional information and tips on what the user should concern doing this kind of task.

For example, Create document (ATTACH DOCUMENT TO PR) – SAP TRANSACTION – CV01N. The old guide told only how to attach a document to a purchase requisition. Not telling the user how this should be done completely from the beginning, only the part with the program SAP. Due to that, the guide needed to be updated with a starting point way back and having an end point further, so the task will be completely done.

Textually, the simplest and direct words were chosen, and the fancy language was left out as the sample below will illustrate, telling the user with an active voice by “talking to the reader”, step by step in numbering way how she/he will execute the tasks.

UPLOAD A DOCUMENT TO IDM

- Open IDM
 1. Open 'WD-P4 Management Master'
 2. Open 'Procurement Management'
 3. Open 'Mechanical'
 4. Open 'Offers'
 5. Open 'Create'
- Create a document
 1. Fill in the name of the document
 2. Choose what type
 3. Save

Figure 3, Create Document – CV01N

CREATE DOCUMENT – CV01N

- 1. Fill in the description
- 2. Click on 'Create Original' icon
- 3. Application: e.g. PDF or XLS
- 4. Data Carrier: ZWDMS
- 5. Original: Link to latest revision of IDM document (Scroll down the IDM document page:)
- 6. Press Enter or
- 7. Document is now created and can be imported to Project builder
- 8. Save and Exit

Figure 4, Create Document – CV01N

The numbering can be found in the graphics in red font and as well on the left side beside it. For making it even clearer, the icons that the user will click on have been snipped and added to the task text.

The total amount of pages that were updated for the existing guides resulted in 57 pages. The way of working for updating these was to first go through the old guides while doing the task in real life, then document everything. When the task was done, I started the editing of the documentation with PDF-editor. Then the edited documentation was moved to Microsoft Power Point where the task text on the side was written. After the editing and writing was done in Power Point they were converted to PDF-files.

When all the existing guides were updated, the creation of the new guides began. The data on missing guides were collected in the qualitative research, so from there on it took off. As the theory suggested, the procedure was to first learn the programs and familiarize with the target group, which were done in the interviews. Followed by how to use the different kinds of tools. In this case for the most part the different kinds of transactions in the program SAP.

When the programs and way of working was learned with a little help from other co-workers, the creation for the new guides began. The whole procedure was alike to update the existing guides, except there was no task from beginning to follow.

Textually and style-wise were the new guides written in the same way and with the same mindset as the updated guides were done.

Hereunder an example will be presented from the 'Create A Covering Letter':

COVERING LETTER

- Covering Letter
- 1. Fill in your name, today's date and the document ID you created in IDM.
- 2. Fill in the consignee, contact, street address and the destination.
- 3. Phone number and mail address of the consignee
- 4. Subject as 'Covering letter – today's date' and the project number.
- 5. Then the 'Work Nbr:', you will find this in SAP. Presented in next slide.
- 6. Fill in the information about the package your are sending. Measurement, weight, and what items are packed inside and their value.
- 7. Upload the document to IDM.

The screenshot shows a SAP 'covering letter' form. It includes fields for Name, Date, Ref. No., Consignee (Name, Street address, Postcode), Phone, Fax, Subject, and Work Nbr. A large text area is provided for the recipient's name. The form also features checkboxes for 'No Agency', 'Power Contract', 'No Information', 'No Order', 'Associated with Order', and 'Project Status'. The Wärtisilä logo is visible in the top left and right corners.

Figure 5, How to create a Covering letter

COVERING LETTER

- Open the `CJ20N – Project Builder` transaction.
- Search and Open the project.
 1. Open `Project & Site Mgmt, Other Cost`
 2. Open `Project Management`
 3. Click on `Courier`

-You will find the identification number aka the `Work Nbr` in the right corner of the 3th point or at the 4th point.

The screenshot shows the SAP Project Builder interface for project P/17406. The left pane displays the project structure with a tree view. The right pane shows the 'Identification and view selection' dialog for activity 601621664, with the 'Courier' activity selected. The 'Costs' tab is active, showing a table of cost elements.

System Status	REL	RETC	Control key	9903	Subtask exists
WBS element					<input type="checkbox"/> Project Sum.
Company Code	P/17406.NCP				
Plant	FZ05		Factory Cal. ID		
Amount		0,00 EUR	Cost Element	7210006	
Distrib. costs			Executn factor	0	
Normal duration		0 WK			<input type="checkbox"/> Flexible

Figure 6, How to create a Covering letter

Graphics was used as much as possible as it facilitates translation, convey information better and describe procedures better than only the text does. To make it even clearer, pointing arrows were drawn to not mislead the user.

The organization of the instructions was according to the different kind of tasks, in a chronological way, from the starting point until the task was completely done.

The total amount of new created guides resulted in 23 pages. As the updated guides were, these were also created with PDF-editor and Microsoft Power Point.

As the theory advise, will these instructions be tested with the new summer trainees, who will begin working in May 2020. After testing, the instructions will either be clear and well-functioning or they need to be rewritten in a clearer way, more informative, more graphical, less graphical etc. Depending on the feedback that will be conducted from the users.

5.2 The work-split and its functions

The creation of the work-split took off in beginning of December 2019. This was created with Microsoft Excel. The most effective way to split up the work tool was in three different sheets. One sheet for beginning of a project, telling the user overall information about the split of work, then the next were it go through a project from beginning to the end, and for sum everything up a third sheet was created to gather every useful thing.

The layout of the first sheet of the work-split can be seen in Figure 3. This sheet will go through some basic information that will be useful to go through with the Chief Project Engineer at the beginning of the project. When the different points are reviewed and accepted, the user can tick the box, and add notes on what has been agreed.

Inductionlist before project starts				
Point	Agreement/task/issue/information	Accepted/Review by:		Notes (What has been agreed)
		CPE	PE	
a	CPE is ALWAYS accountable even if PE is responsible for some task	<input type="checkbox"/>	<input type="checkbox"/>	
b	Having point no a. in mind – which responsibilities could you / WOULD LIKE TO take as your own? Is it based on experience or is it as	<input type="checkbox"/>	<input type="checkbox"/>	
c	Introduce stakeholders and everyone involved in project (W, Citec etc)	<input type="checkbox"/>	<input type="checkbox"/>	

Figure 7 Introduction sheet for the work-split

On the following 'Work-Split' sheet the actual work-split between the Project Engineer and Chief project Engineer will be presented. Starting in top of the page, the user will fill in the specific project id and what kind of engines the project will have. The layout is in accordance with the timeline of a project, starting from Sales/Planning Phase to Commissioning Phase. In this can the user open and close via a function the different phases. Here will the user find everything from every mechanical system, scope of supply list, inquiry sheets linked, who will handle the documents, how to handle the documents and overall how to do things with the work tools. If the task has to do something with a work tool, a guide has been hyperlinked on the left side of the task's name. A deadline function has been added and will turn red when the date has passed the deadline date. Beside the "Deadline" column is a column for notes and next to it a status function with three different status mode. The three different modes are 'Draft', 'Checked' and 'Approved', depending on what status the task or system are in. This illustrated with a drop-down menu function.

The three end columns indicate to which person who should either 'Make', 'Check' and 'Approve' each different discipline. This illustrated with a drop-down menu function.

	A	B	C	D	E	F	G	H	I
1		P/00000, Project name							
2		Engines							
3									
4		Work Split PE/CPE Mechanical	Phase	Deadline	Notes	Status	PE	CPE	Citec
5									
6		Planning/Sales Phase (S0)	Open	Close			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		Project Start (S1)	Open	Close			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11					Read Contract	xx.xx.xxxx	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12					Scope of Supply	xx.xx.xxxx	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13					Technical Specification	xx.xx.xxxx	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14		How Do I Do This? (Click Me)			Create 6.1 structure in IDM	xx.xx.xxxx	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15		How Do I Do This? (Click Me)			Create MS/SUS (MCOR/CCOR)	xx.xx.xxxx	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 8 Work-Split.

6 Conclusion

In this chapter will the conclusion of the thesis be discussed, followed by a personal suggestion on further development.

6.1 Summary

The aim of this thesis was to try to answer the following research questions:

-What problems do newcomers find in the daily work?

The problem that the newcomers struggle with were for the most how to use the daily work tools, who to contact and what to do. Due to that, many kinds of guides were created and updated to cover that issue.

-What kind of guidance would be helpful?

Since a newcomer is new to the job and most likely never used the different work tools, a guidance for it were created in the most constitutive way. Along with a work-split, full of useful links and constructed according to the timeline of a project.

-What is the PE's perception on how the work should be split?

-What is the CPE's perception on how the work should be split?

Since every person has their own way of working, experiences and possesses expertise in different disciplines, the most effective way to split up the work for the Project Engineer and Chief Project Engineer is individually between themselves. Most efficiently before the project is starting. Therefore, the work-split has a tick box- function that can be ticked.

-Why aren't the users reading the guidance instructions?

Since the guidance instructions are for the most too boring for the human nature, they have to be simple and short as possible. To catch the eye and attention, pictures and illustration can be used as much as possible.

6.2 Challenges faced

The challenges faced during the creation of this thesis were plenty. For the first, try to find out the problem and what will be in the scope. After the scope and problem was fairly clear, what questions will be asked to the target groups to get the right data. As I have worked in this position for a while, did I know of some useful instruction that could be created. Working in a position for a while will also make you not see the things that others can see to be hard and unclear, because you are bumping into these things every day in the work.

Finding volunteers for the interview was also challenging, due to the busyness and unstableness with the re-organization.

Finding out what was the latest guides and finding the guides was also challenging, due to the company's massive data bases.

Even though the instructions seem to be simple, the creation of them was really time consuming.

The creation of the excel work-spilt was also more challenging than I thought from the beginning. I was not satisfied with the basic functions in Excel. Due to that this needed to be programmed with VBA (Visual Basic for Applications). The programming itself was also time consuming.

6.3 Further development

This thesis was done from the perspective from a Project Engineer Mechanical only. The same could be done from the perspective of a Chief Project Engineer Mechanical, since the position of it requires more responsibility and handling of customer relations. To make the guides more catching, the availability of them can be done in a wider scale apart from just text and pictures, such as videos with commentary. Some people will learn better from text, while other will learn better from watching a video. The more way the guiding will be available on, the greater the chance are that the different kinds of target groups will learn from it.

The qualitative research could be done in a wider scale, by interviewing more people within the same area.

Another issue will be to find a good solution on how to have the instructions up to date. Programs will always be updated, which will most likely result in the way of working will change in a small or big grade.

6.4 Comments

The work of this thesis has given me a lot of insight for the way of working, working tools and the position itself of the Project Engineer Mechanical. Since I have worked in this position, writing the thesis is a win-win-situation for me. I would like to give my deepest gratitude to Wärtsilä for giving me the opportunity to write the thesis for the company. I would also like to extend my deepest gratitude to the people involved to help me on my journey. Last but not least, I would like to give my deepest gratitude to Mikael Ehrs, Thomas Kronqvist and Anders Ahlqvist for supervising me through this thesis.

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