

A study to assess the benefits of the handbook and the need for it

a qualitative study as part of composing the handbook of maintenance planning

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The challenges of climate change force us all to act and this also creates new business opportunities. One of the opportunities is storing and optimising the energy in the electric grids and releasing it as needed. Wärtsilä Energy Storage & Optimisation -business is answering this emerged need. The need has pushed the business to steep growth as well as the different teams and the maintenance planning teams working globally, on which this thesis work is focusing. This thesis is done in cooperation between Wärtsilä and University of Turku in two sections. For satisfying academic needs as well the company needs. The sections are divided into this thesis work and the composition of the handbook if proposed so. This thesis work addresses the growth of the maintenance planning team and specifically the importance of onboarding of newcomers which is reflected against the literature. The onboarding process has a major effect on company turnover if executed inefficiently or otherwise neglected. The initiative of composing the handbook of maintenance planning is given by individual employee and therefore this initiative needs to be evaluated to be founded as a plausible way to address the so-called growing pains of the company which are stated as part of the hypothesis or alternatively objecting to the argument. This thesis designs, evaluates and deploys a global survey among the maintenance planners to address their past and current experiences and to obtain their current views of how the knowledge is being managed and what risks they recognise. The conclusions after the evaluation process are that, with some deviation between the respondent groups, they all do recognise a moderate need for having the specified supportive material in their daily work, such as the handbook of maintenance planning. The thesis proposes the composition of specified onboarding material to begin and underlines the importance of keeping the material up to date to address the onboarding process challenges in the near future.

Key words: Survey, handbook, onboarding, socialisation, knowledge management.

Table of contents

| | | |
|----------|--|-----------|
| 1 | Introduction | 5 |
| 1.1 | The purpose | 6 |
| 1.2 | Research questions | 12 |
| 1.3 | Outlines of the thesis | 13 |
| 1.4 | Company introduction | 15 |
| 2 | Theory and approach | 18 |
| 2.1 | Theory and literature review | 18 |
| 2.2 | Growth | 26 |
| 3 | Methodology | 29 |
| 3.1 | Qualitative research in the company environment | 30 |
| 3.2 | Designing the survey | 31 |
| 3.3 | Prior deployment testing | 34 |
| 3.4 | Survey implementation and deployment | 36 |
| 3.5 | Confirmation bias in the survey | 38 |
| 4 | Results | 40 |
| 4.1 | Decoding of the responses | 41 |
| 4.2 | Decoding the variables | 47 |
| 4.3 | The extracted variables and evaluating the confirmation bias | 52 |
| 4.4 | Response rate | 54 |
| 4.5 | Ineligible responses | 55 |
| 4.6 | Recognised variables | 55 |
| 5 | Conclusions | 56 |
| 5.1 | Possible errors in the survey | 58 |
| 5.2 | Proposal | 60 |
| 5.3 | Further development | 60 |
| | References | 62 |
| | Appendices | 65 |

Figures and tables

65

Appendix 1 & 2

66

1 Introduction

The challenging and demanding times are driving the business of Wärtsilä Energy Storage & Optimisation organisation for achieving the decarbonisation targets of the countries and balancing the electric grid stability demand. The same demand has driven this thesis to first emerging as an initial idea, later formalising as an actual thesis work and lastly, aiming to recognise the meaningful and plausible outcome for the company and academical purposes. The thesis work was executed in cooperation with Wärtsilä but making a distinguishment between the possible outcome and result, which would be the composition of the handbook of maintenance planning, and the other side, the academic purposes to which this thesis work itself is targeting to give satisfying results.

As the climate change is clearly a felt and recognised threat to our societies around the globe, new business areas are therefore emerging to be satisfied. As there is a growing need to prepare and eventually to withstand the climate change effects, the growing need has pushed the Energy Storage & Optimisation -business to emerge. The business aim is to optimise the electrical energy systems and to store the electricity in the battery containers to be released when needed. As is the demand, also the growth of the business has been steep and therefore the organisational growing pains has stepped in due to the growth. The energy storage power plants need preventative maintenance, and the maintenance planners are there for planning and organising the maintenance events. However, the maintenance planners, to which this thesis work is focusing on, can't avoid the effects of the growing pains. The growing pains are recognised generally by various researchers in different companies but just couple of the individual employees have recognised or brought them in awareness of others in the company that there are possibly growing pains present among the maintenance planners and they need to be addressed in order to avoid managerial and therefore economical risks in the organisation and also to ensure the efficient development of the organisation in the near future as the growth is expected not to disappear.

The individuals that have recognised the growing pain challenges among the maintenance planners, are proposing to release the supportive material that could form a major part of the individuals onboarding process. This proposal, which translates to the main hypothesis and later as research are the very key elements and basis of this thesis work. The intention is to measure and qualify if, and what sort of needed support is recognised by the target group of maintenance planners at Wärtsilä and depending on the outcome of the research, which is

conducted in a form of survey, gives the support or alternatively objection for composing the newcomers onboarding material. The initial argument that the specified onboarding material could bring help, must be plausible to start the second phase of the work, which works as the conditional boundary for this thesis and would initialise the process of composing the handbook of maintenance planning. As the initial idea comes from couple of individual employees, the confirmation bias is needed to be considered. The confirmation bias is recognised, separated and evaluated in the work and the different groups of survey respondents are assessed for having the results and to form the conclusions in the end. By considering all the variables, the confirmation bias, the different response groups, such as age, experience etc. will be the foundation if the placed hypothesis will be plausible not just by the individuals who gave the initiative but all the teams across the globe.

1.1 The purpose

This thesis work contains two separated individual sections, but they are directly related to each other's. The first section is this thesis work document analysing, measuring and evaluating the importance of the Handbook of Maintenance Planning when digitally onboarding new incomers to an organisation and specifically in the geographically dispersed maintenance planning team. Part of the evaluation process is to design and deploy a questionnaire survey among the maintenance planners. The second section is the composing of the Handbook of Maintenance Planning used in the daily work of maintenance planners in the target company Wärtsilä and particularly within the ES&O (Energy Storage & Optimisation) business line. The purpose of this distinguishment is to keep internal and external material separated while fulfilling both, the academic and the target company needs. The purpose of this study is to find a plausible proof for the placed hypothesis suggesting that this organisation in question can achieve benefits when specified digital onboarding material is available for the new incomers in the organisation in question, as well for the more matured employees. There is a presumption that in organisation that works remotely due to different locations geographically can find benefits from handbook like onboarding material. This presumption is profoundly studied in this first section of the thesis work and if support is founded, a proposal of composing the Handbook of Maintenance Planning will be proposed after.

The methodology used in this thesis is exclusively qualitative, based on its characteristics the analysis is made to form categories and generalisations and broad patterns by observations, described by Saldana et al. 2011, 4-5, 90 and measuring experiences of individuals instead of working with exact quantitative, directly measurable values or highly structured questionnaires (Oflazoglu 2017, 5). This study addresses the employees current and past work experiences working in Wärtsilä as maintenance planners and reflects them against literature to find patterns that indicates the need of supportive material if the indication is recognised. The experiences are collected with the designed questionnaire survey that will be deployed in the target organisation for collecting the raw data to be put together and which will be analysed, and conclusions will be drawn.

The demand of having new digital onboarding material, for example a handbook like material has emerged due to growing organisation and teams, and managing the growth of the business and the teams can partially be fulfilled with the help of specified and targeted digital onboarding material, such as The Handbook of Maintenance Planning in this target company and its maintenance planning operations in question. Especially as the organisation and the teams are working geographically distant from each other's, the digital onboarding material is generally important as the individuals onboard period support is not always available when most critically needed. The need for this kind of handbook material has been recognised in the team and approved in the higher level of organisation as well but there is uncertainty if such onboarding material can overcome the efforts of making it and would it be used after publication, to which this research is aiming to answer. The importance of properly executed digital onboarding period as well as traditional onboarding period has previously been widely recognised and therefore in this study the elements of qualitative research are used to reflect and to confirm that the specific onboarding material can provide organisational benefits and overcoming the efforts of making it and overcoming the threshold the target audience find the proper use of it. The above mentioned will be measured during the questionnaire survey for having the experiences of the current employees listed and to find the deviations between teams and to separate the confirmation bias off the initial idea of composing the handbook. The confirmation bias is considered as one might claim that the blue is the best colour to represent the company but what does the employees think about it, what's their opinion?

Employee retention has become a bigger challenge for organisations as the employees are more likely to change organisations than previous generations. It has been found that new incomers onboarding experience has a crucial role with company turnover deriving from e.g.,

job satisfaction, organisational commitment and job embeddedness (Brett, S. et al. 2023, 164-165). Controlling the turnover begins already at the recruitment process while providing the position applicants a realistic, honest and neutral description about the open position and the organisation in question. This already reduces the probability of negative turnover effect by avoiding any negative surprises for the hired newcomer. The RJP's (term. Realistic Job Preview) can be the most effective way of affecting the turnover by giving the honest analysis and description of the insides of the work task, organisation, team, development and the strategy of the company. This gives the opportunity for the position applicant to make their most objective evaluation of the company and if they can recognise themselves positioned in there. (Hom, P. et al. 2020, 241-245). This study however focuses on the onboarding period of one but underlines the importance from all the way to the beginning towards the daily work of more matured employees. A growing organisation can be balancing between growth and employee's capacity to withstand the organisational needs before finding the resources matching the demand, the balance of workload and recovery. This is one of the subcategories of company's growing pains studied by Yeongjun & Chansoo 2018, 19. Therefore, and particularly in remotely working and geographically dispersed organisations a supportive material is also needed for partially managing the growing pains of a company, and this need has been recognised during the organisational journey in the target company Wärtsilä (ES&O), as well among various researchers accompanied by several studies reviewed. The most common organisational growing pains can be such as one is having a feeling of not enough time for the work, always putting out fires, transparency, lack of understanding of company's direction, lack of managerial skills, not trusting others, growing in sales but not in profits or lack of employee embeddedness due to various reasons (Flamholtz, E. et al. 2015, 94). The rapid growth in organisation can also propose a very and overly optimistic and positive picture of change within and success within the organisation and the rapid change does not appear to be manifesting the negative effects as strong as positive perceptions, as the perceptions of employees have been studied in the companies that are in different phases of growth. (Church, A. et al. 1996, 30-31). This phenomenon can possibly leave the negative effects hidden.

The process for this thesis work is to reflect and evaluate the existing research material to the situation of the organisation and maintenance planning team in question and to conduct a questionnaire survey among the organisation and specific members of the organisation. If, after the analysis, this survey in question indicates that supportive material is needed, the

design and compilation of the handbook will begin and the form of it will be defined to align with the internal needs and it will eventually be the supportive element for this geographically dispersed team in the near future as growth of the business is estimated to maintain the growth of the teams as well. This thesis work does not measure and analyse the benefits afterwards if the handbook is proposed to be composed and deployed as the period consumed would be too long and the limited research area would expand leading to an impractical outcome for the academic purposes. However, if the survey deployment and the results are successful for the second phase, the same surveying method could be followed in future to assess the current need of updating and to have the feedback of usability of the handbook in use. This only applies if the outcome of this research in question proposes composing the handbook to be launched.

This thesis is structured to explore the hypothesis suggesting the potential benefits of a specified onboarding material, a handbook for maintenance planners within Wärtsilä and how such a tool might enhance the onboarding process in a geographically dispersed and time-zone wise diverse team. The thesis is designed to address key aspects of this issue, including the collection of relevant data through a questionnaire survey, and an analysis of the results to determine whether the hypothesis seems plausible and the composing the handbook and be proposed.

The initial chapter of the thesis presents a review of existing literature, focusing on onboarding processes and recruitment, the connection of effective onboarding in company turnover, and the impact of employee experience on organisational efficiency. The literature provides a foundation for the proposed hypothesis, offering insights into best practices and theories that support the idea of creating an onboarding material tailored for the needs of new employees. This foundational knowledge helps in understanding the broader context of onboarding challenges faced by organisations, particularly in remote and geographically distributed teams.

Building on this theoretical framework, the thesis then outlines the methodology for data collection. A questionnaire survey will be deployed within the target group of maintenance planners in different teams to gather real-world insights into the challenges they face during their onboarding process and most importantly, to find support for the hypothesis; is there a recognised demand for having the supportive material. The questionnaire survey focuses to assess the current state of onboarding practices, to identify any gaps, and understand the

specific needs of maintenance planners in relation to support materials. The general satisfaction levels and the specific indication for having the supportive material are to be evaluated. By surveying these groups, the thesis seeks to validate whether the composition of a comprehensive onboarding handbook would be a valuable addition to the company's existing onboarding processes.

If the introduced hypothesis is found plausible by the survey findings, the thesis will propose the next steps in the process, which include the development of the handbook and defining in what form it serves the teams the best. The outcome of the study will be a recommendation for the implementation of this handbook as a resource to streamline the onboarding process and improve overall efficiency in the maintenance planning team at Wärtsilä. It must be underlined that the efficiency does not limit to the onboarding period but a handbook like material can be found beneficial in other circumstances also.

In summary, the thesis is structured to assess the validity of the hypothesis through literature review and primary data collection, ultimately leading to the potential creation of an onboarding handbook that addresses the needs of the maintenance planners.

This thesis work focuses on the battery energy storages and its lifecycle operations from the other Wärtsilä business lines. These operations are called the ES&O (Energy Storage & Optimisation). Lifecycle management is considered as a phase after the project phase and the handover to customer and for the lifecycle management team. It includes the certain interval of planned maintenance activities, by certain, the interval deviates according to the equipment installed on site. Due to the rapid growth in the energy storage business, new employees are constantly hired to fulfil the company needs. Growth in sales-, project- and maintenance departments do all have their own demands and needs and, in this thesis, it will be focused on the maintenance department and its maintenance planning operations, or lifecycle management, like described above, however the results of this thesis work can be reflected across the other business lines or departments as well and also in the questionnaire survey the other business lines are observed if they will response with precise enough raw data, meaning having enough information in form of responses to form plausible conclusions. The intensifying customer demands and competition in the market makes the companies to balance between growth and the workload of employees, which can be recognised as term of growing pains more profoundly reviewed as the growing pains are also present in Wärtsilä

ES&O, which is recognised as good and bad thing at the same time, ultimately a subject needing to be assessed with effort by different management related organisational functions.

The team of maintenance planning does work geographically dispersed and in multiple time zones from United States to Australia. This makes it vital and mandatory to master the skills of remote working both in managerial and the employee positions. As the need to hire new employees stays high during the rapid growth phase, the managerial and onboarding capabilities are also placed in to test in this environment, which is part of the growing pains, the HR practices like onboarding programmes or their possible absence. Along the organisational journey of ES&O, the needs of enhancing the onboarding programs of people have been recognised. The distant work from other colleagues can isolate individuals and lead to outcome scenarios that are not very efficient or can be even harmful from the company point of view. Inefficient onboarding can have a major effect in company turnover and waste the time of line managers and other stake holders connected to the individuals onboarding process. During the onboarding process the new content of information (tools, ways of working & the culture) needs to be dosed the just a right amount for the new incomers to keep their motivation high and later to result in finding the loyal and work embeddedness and satisfaction finding asset.

As the need for enhancing onboarding programmes have been recognised during the organisational journey, a hypothesis or a firm assumption has emerged or being proposed during the general reflections within the group that a specified onboarding material might bring support during the onboarding process of an individual as when the new incomer joins the organisation, one might be completely alone as the colleagues might be in different place location-wise and also not be available when most critically needed due to the different time zones. This raise concerns as there is responsibilities already proposed but at the same time the support of people, the colleagues might not be present, and the free time or office time hours are not aligned with the colleagues. The reflections give the support for the assumption that the issues might partially be addressed by compiling the handbook of maintenance planning for the team, which would contain the detailed and guiding material for each or for most of the scenarios in the daily work of maintenance planners. This assumption has led to an proposal that the hypothesis needs to be tested, and a questionnaire survey needs to be conducted inside the organisation for finding the support, or alternatively opposition for the hypothesis, which therefore would lead to a different outcome of the second phase of the thesis work as the composition of the handbook would be rejected, or the need of having it.

The university academic needs would still be fulfilled for having the satisfying result. The composition of the handbook is not connected to university needs in any way for not preventing the continuity of studies.

The purpose and aim of this thesis work are to test the hypothesis and to collect the raw data with the help of a questionnaire survey and to analyse the results that might lead to a compiling of the handbook of maintenance planning. The study meets the qualitative research criteria as it collects the raw data in a form of individuals' experiences, emotions, thoughts and current views of the environment. The aim is to compile the handbook of maintenance planning if the hypothesis is proven plausible, meaning that there is a real recognised need within the organisation to have this kind of supportive material which helps individuals during their onboarding process.

1.2 Research questions

The importance of the properly executed onboarding process is clearly recognised by many of the researchers and as the target company and the individual business line in it (Energy Storage & Optimisation) has been in rapid growth the onboarding process of the maintenance planners across the globe has been decided as a target group for this thesis work. As the challenges of the onboarding process have previously been generally recognised and described, therefore the target group in the company is assumed to have similar challenges, they also have been recognised by individuals but to assess the existence of the challenges more profoundly, the research questions need to be proposed that address the hypothesis regarding the onboarding process.

The proposed research questions are related to individual maintenance planners' experiences of their current and past work environment. By environment it is meant the level of general satisfaction towards the current environment and their role in it, and the knowledge management related challenges, which are the most important when evaluating the need of improving them with handbook-like material. Do individuals recognise the need for having a supportive material, such as handbook-like material in their daily work for giving support for the proposed challenges? What is the level of the assumed demand for the supportive material is tried to be understood in this thesis work and are there deviations between individuals or group of individuals, such as age, gender, experience or other related groups and variables.

The proposal for composing the handbook of maintenance planning is needed to be recognised, not just by the thesis worker but the whole group for finding the plausible support for continuing the process from first phase. If the knowledge management is already well defined and secured in the organisation, the need for having the supportive material will be recognised just as minor need and therefore the process does not continue in the phase of composing the supportive material, which is the second phase described previously.

The key elements of this thesis work are to recognise the support or alternatively the objection for the proposed hypothesis and to recognise possible deviations among the different groups of employees for having the more profound understanding and direction for the possible handbook project.

1.3 Outlines of the thesis

The thesis work and company boundaries and the process are described like in the flow chart in figure 1. The reflections against the available research literature are forming the robust foundation for the hypothesis that a specified onboarding material is a valuable material for the organisation in question. The questionnaire survey will be used for obtaining the raw data and information from the target survey group of maintenance planners. The raw data will be analysed to form the results and if the hypothesis is proven to be plausible or valid the process will continue to the composing of the handbook of maintenance planning. However, this separates the university, and the target company branches, and the possible handbook is not shown in this thesis work. The responsibility areas of the maintenance planner are well defined in the organisation, leading to that the outlines of the handbook would be moderately easy to be defined.

The literature is mainly focusing on the onboarding process, recruiting, questionnaire surveys and how the onboarding and individual experience of it is related to company turnover, as well how the company manages its growth. The support for the hypothesis or the assumption is founded from the literature but the connection to the target company Wärtsilä (ES&O) is measured and evaluated with the help of the questionnaire survey by surveying real-world target group of maintenance planners.

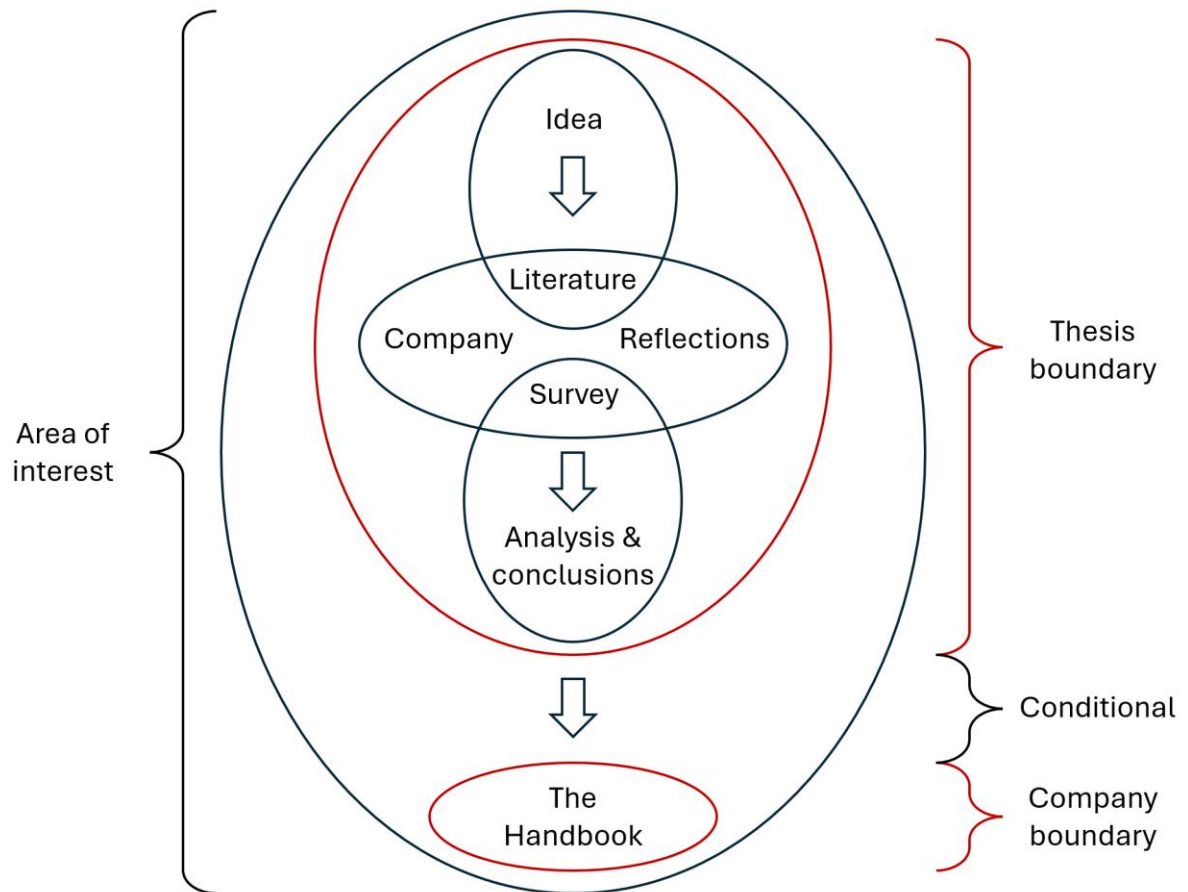


Figure 1. Thesis process and boundaries.

1.4 Company introduction

Wärtsilä is over 190 years old and today a heavy engineering industry mainly known for its vast ship engines and powerplant engines and today growing its market portion with the battery energy storage business. The journey has started from a local sawmill and all the way to being global leader in innovative technologies and lifecycle solutions for the marine and energy markets as the company introduction officially states. The company is listed in the stock market of Helsinki which is part of the NASDAQ OMX concern.

On this date, Wärtsilä operations separates to the following business lines below:

(quotation starts)

*“**Wärtsilä Energy** leads the transition towards a 100% renewable energy future. We help our partners to accelerate their decarbonisation journeys through our market-leading technologies and power system modelling expertise. These cover decarbonisation services, future-fuel enabled balancing power plants, hybrid solutions, energy storage and optimisation technology, including the GEMS Digital Energy Platform. Wärtsilä Energy’s lifecycle services are designed to increase efficiency, promote reliability and guarantee operational performance. Our track record comprises 79 GW of power plant capacity and 125 energy storage systems delivered to 180 countries around the world.*

***Wärtsilä Marine** is a global pioneer in power, propulsion and lifecycle solutions for the marine market. We develop industry-leading technologies, advancing maritime's transition to new fuels. We support building an end-to-end digital ecosystem where all vessels and ports are connected. Ultimately, Wärtsilä Marine is driving the shipping industry forward on its journey towards a decarbonised and sustainable future through our broad portfolio of engines, propulsion systems, hybrid technology, exhaust treatment, shaft line solutions and digital technologies, as well as integrated powertrain systems. Our offering, which is underpinned by our performance-based agreements, upgrades, lifecycle solutions, decarbonisation services, as well as an unrivalled global network of maritime expertise, delivers the efficiency, reliability, safety, and environmental performance needed to support a safe and sustainable future for our customers, our communities and our planet.*

***Wärtsilä Portfolio Business** units are run independently to accelerate performance improvement and unlock value through divestments or other strategic alternatives. Currently*

Portfolio Business includes Automation, Navigation & Control Systems (ANCS), Gas Solutions, Marine Electrical Systems and Water & Waste.

- ***Automation, Navigation & Control Systems (ANCS)** transforms vessel journeys through the use of innovative hardware and software technologies. Our primary focus is on enhancing safety, improving efficiency, and ensuring compliance. With a strong legacy of pioneering advancements in maritime technology, our comprehensive range of solutions includes user-friendly integrated navigation and automation systems, sensors that enhance safety measures, and Dynamic Positioning (DP) systems.*
- ***Gas Solutions** is a market leader with innovative systems and lifecycle solutions for the gas value chain. Our main focus areas are the handling of gas in seaborne transport (storage, fuel, transfer and BOG management), gas to power, liquefaction and biogas solutions. We help our customers on their journey towards a sustainable future through a focus on lifecycle performance, innovation and digitalisation.*
- ***Marine Electrical Systems** is one of the leading system integrators, specialized on navy, complex vessels and large yachts. Our highly specialized and complex electrical systems integration competencies, connecting own equipment and equipment added by the yard into one electrical network, makes us unique on the market and are highly valued amongst our clients.*
- ***Water & Waste** offers the widest portfolio of environmental solutions that meet all existing and anticipated regulations, including regulations for environmentally sensitive areas. We support our customers with a complete lifecycle offering to ensure the highest operational efficiency, compliance and enhanced environmental performance. Wärtsilä Water & Waste has developed a broad range of specialised and proven environmental products, such as Wastewater treatment (conventional biological sewage treatment plants and advanced membrane bioreactors), Ballast water management systems, Fresh Water generation (reverse osmosis plants and evaporators) and Vacuum toilets and vacuum collecting systems.”*

(quotation ends). (Wärtsilä, Our businesses, 2025).

As Wärtsilä is building the engines for ships, powerplants as well building the energy storage systems, the main business is to sell the lifecycle management included, meaning to provide the maintenance, software and other services during the products lifetime. Handing over a power plant for the customer could be intimidating for them, which therefore leads to the purpose of selling the lifecycle support service with the plant. The focus on this thesis work is also linked to the exact above mentioned lifecycle services, and particularly within the ES&O (Energy Storage & Optimisation) maintenance planning activities.

2 Theory and approach

The individuals onboarding process, the settlement process in the new company environment, culture and ways of working begins from the interviewing of the role candidate and lasts effectively almost the first year in the company once chosen. The focus towards the new incomer is particularly important during first months of the onboarding process and especially as it have been described, in the geographically dispersed remote working organisations, the amplifying factors for the importance of the properly executed onboarding are well presents. The onboarding process needs to be effective and being able to dose the correct amount of new information for maintaining the motivation of the new incomer and to increase the probability for having later of a loyal asset for the team, organisation and the company. The support needed by the new incomer stays high during the first months and the guidance during the onboarding period is crucial for avoiding the phenomenon that individual learns their own ways of working and avoiding the effective ways of working. The onboarding process has a multitude of dimension that are to be addressed and reflected towards the target company prior to assessing the proposal of research questions that are needed to be answered.

2.1 Theory and literature review

Onboarding into a company can be expressed as a process that supports a person to become a productive and loyal member of an organisation (term. socialisation) in the most efficient, convenient and effective way (Lauby 2016, 11). Socialisation can be understood as set of introductory events and activities which support the new incomers to find the sense of their new environment and about the new experience they are encountering for their first times. It can be seen as the learning and absorption process and the specifically absorption of the new environment's habits, attitudes and behaviours or ways of thinking and working in there. (Saks, A. et al. 2018, 13-14) It is important to distinguish between orientation and onboarding. Orientation can, however, be part of the onboarding but they are determined and understood as different concepts. Orientation can be described as a series of processes where new incomer participates to a series of activities in focus of transferring information about the organisation e.g., watching videos, reading the organisation chart manuals and having meetings with all the relevant line managers or other direct colleagues. Many of us can recognise the orientation activities of being a student or a fresh employee. Onboarding

focuses more on enhancing and the engagement and productivity of a fresh individual, the not so explicit features that Brett et al. & Hom et al. have recognised and found the link to the company turnover which applies generally to every company. The successful onboarding is taking place when the dosing of new content (information and experiences) is managed and well balanced towards the new incomer – if certain personal thresholds are crossed for too long time due to wrong design or unbalanced execution of onboarding, the new incomer might encounter a wall of self-doubt or feel ashamed of one’s new responsibilities leading to negative outcomes in medium-term interval. However, there are differences between individuals and the same practicalities can’t be applied to everyone. It is therefore critical to understand the current emotions of the new incomer for enabling the possibility later to find a loyal and robust asset for the organisation for a long-term period. This phenomenon is directly related to the term organisational socialisation described above by Harpelund, C. et al. 2019, 9-10 and Lauby 2016, 11. Below in figure 2. is an amended (adapted from the original) visual explanation by Saks, et al. regarding the new incomers’ engagement process and its different outcome scenarios due to different sets of socialisation processes. The visualised explanation summarises more understandably the importance of the balance in the dosage of the new content towards new incomer described previously.

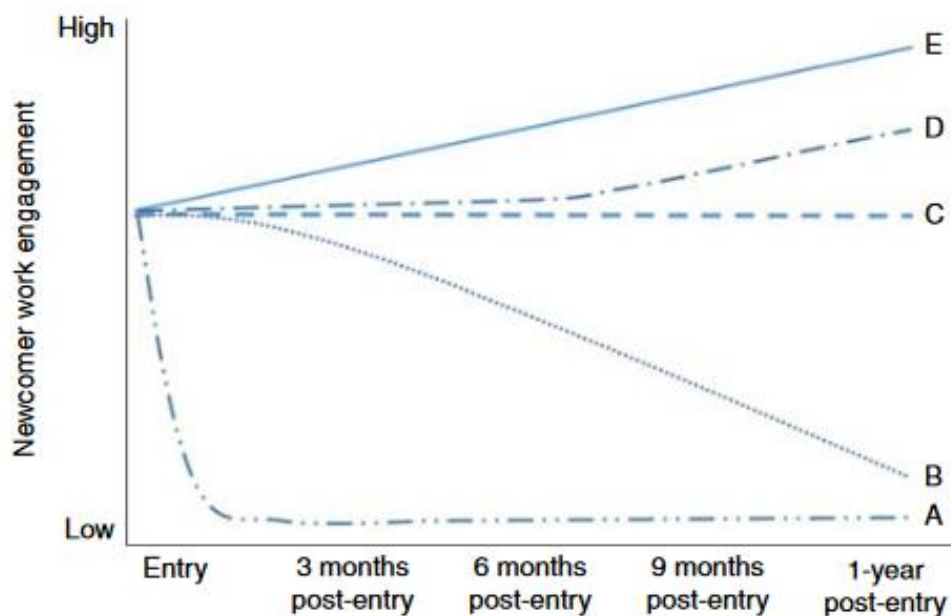


Figure 2. Newcomer work engagement process and different outcomes (Saks et al. 2018, 15).

In figure 2. above on curve (A) it can be seen that immediately the new incomers engagement to work decreased steeply. This could indicate that the RJP (Realistic Job Preview) was

neglected, or the process of socialisation was very poor. As an outcome it is almost impossible to maintain the engagement to work or it is done with great unwillingness. This will lead to negative outcomes in various ways. The employee does not find the satisfaction or might feel overwhelming in their current environment and begin to focus the very minimum and blocking the development of one. Curve (B) is revealing that the same result is achieved than with outcome (A). This could indicate the socialisation program was maintained at the beginning and the incomer was dosed with appropriate and suitable content but after initiative steps the content and therefore the engagement disappears as the time passes. This curve (B) can possibly be recognised in the target organisation as the teams work very distant (physically and mentally) from each other's. Curve (C) indicates relatively steady engagement outcome possibly due to various socialisation activities, such as assigning a work buddy, which is a work life terminology for assigned person who assists the new incomer with the basics and more advanced things, as long enough the new incomer can alone maintain their work process and develop it. The mentor buddy provides help and guidance, or various kinds of support directly related to work. This is clearly related to onboarding material where this thesis work study also targets as above mentioned, the teams work distant and dispersed, a possible supportive material helpfulness is recognised. Curves (D) and (E) indicates that the company has conducted a highly effective socialisation program and managed to increase the new incomers job engagement and excitement and maintained the satisfaction of theirs. This also has direct consequences against the company turnover as the engagement increases with embeddedness and overall employee satisfaction. Having the new incomer dosed with the suitable amount of new content and information and letting them have positive experiences in the new environment, this have many indications to what is expressed in a plain language that a happy worker is more productive worker although the level of happiness can be affected by multiple things and therefore it can't be exclusively stated so. (Cropanzano, R. et al. 2001, 190–193 & Swindall, C. 2010, 186–187 & Chamakiotis et al. 2025, 2). The connection between the employee satisfaction and company turnover has been studied and recognised over decades by number of researchers.

As described above, the traditional onboarding includes a set of formal and informal activities and policies and the central target for the activities is to facilitate and make it possible for the new incomer to adjust themselves in the new environment. The onboarding of new employees is recognised important for numerous reasons, most recognised is the productivity of a happy employee. The standard configuration of a new employee joining the company is that their

level of satisfaction is very high when they accept the offer, join the organisation but immediately after that their level of satisfaction drops from 70 % to 30 %. (Chamakiotis et al. 2025, 2). The general aim of the onboarding is therefore to mitigate the drop of satisfaction. The person might feel overwhelming with the new responsibilities and specifically after the realisation of them as during the interview process, they are reviewed in high level and prior accepting the offer, the responsibilities might feel distant prior one needs to take the responsibility of those. This is directly connected to the RJP (Realistic Job Preview) and its importance against the onboarding process even this part of the recruiting process and interview described by Hom, P. et al. 2020.

Many of the research papers and the firm believes or understanding we have regarding the onboarding are based on the very recent history. After the COVID-19 pandemic and before that, there was no unclarity that with an increasing rate and today more than ever, many or most of the teams and organisations are at some level working hybrid or completely remotely. (Chamakiotis et al. 2025, 1). The traditional management and onboarding theories might not fully be applicable on todays remote working environment. The geographical distance, different time zones and organisations in steep growth are faced with the new onboarding challenges.

The target company Wärtsilä has been founded over 190 years ago but due to discovering of new business areas (ES&O + Greensmith), new organisations and teams have emerged to satisfy the needs of the new business pull and growth in question. Working remotely has generally increased dramatically during COVID-19 (McPhail, R. et al. 2024, 1) and as well in Wärtsilä, which has already been working geographically dispersed making it vital and mandatory to master the skills of remote working. At Wärtsilä, there has been reflections that a digitally accessible onboarding material might partially address the difficulties of digitally onboarding people in remotely working organisation that is in constant steep growth and balancing between employee's workload and organisational limitations (growing pains described previously). In this thesis work the focus is on the growing maintenance planning team and its operations, but result shall be reflected to other teams also as their structure is very similar in the same organisation. The questionnaire survey will also gather data from other business lines and their maintenance planners to address possible deviations and possibly finding common patterns.

In a company that is forced to work remotely by dispersed geographical locations and accelerated even further by COVID-19 pandemic and as well by the long-term increase in remote working generally, the term Digital Onboarding emerged to act a bigger part in the onboarding processes described previously. It has been studied by Sani, K. et al. 2023, 650-651 that there are both, positive and negative impacts on employees when onboarding new incomers digitally. Digital onboarding can reduce the amount of hostility, meaning for example harassment, bullying or intimidation and specially among employees who recognise themselves as introvert personalities rather than extroverted, the negative or positive effect are stronger. Negative impacts of digital onboarding have been founded such as social disconnection, disappearing meaning of work, loss of transparency and mistrust issues. The study supports the previous claim placed by Harpelund, C. et al. that the successful onboarding process, the organisational socialisation is highly connected to individuals' emotions and observing and understanding them during the digital onboarding period is crucial for the team's success. There is a higher probability to negative employee outcomes if during the onboarding period (traditional or digital) the new incomer is left and felt isolated to embrace themselves in the organisation by their own tactics, meaning in vernacular language, one might find their own ways and areas of working making it not so efficient for the organisation and sort of building a limitation for one's own expertise. This phenomenon is also found by Flamholtz, E. et al. 2015 that individuals or small groups might their own company inside the actual company due to lack of communications or lack of knowledge by management or just by the feeling of it (Häkkinen 2024). This situation may lead to negative results and experiences, as the study by Sani, K. et al. is suggesting; the risks of social disconnection, disappearing meaning of work, loss of transparency and mistrust issues may materialise (come into practice). Petrilli, S. et al. 2022, 2-3 proposes that there are four phases in the onboarding process. The first one are the general rules of the new environment, understanding how the new environment works. The second phase is related to clarification of the new incomer's role in this environment and their expectations in it. The third one is related to the culture and finding the sense of its norms, which are not automatically transferred to a new incomer, and therefore they need to be included in the onboarding process. The last and fourth phase is related to the individuals' connections to their surroundings, meaning the creation of network that allows one to perform effectively once completely onboarded. Performing effectively as individual does not only open the gates for team level effective success but the comprehensive effect takes place when collectively working along with the team individuals which is taking place during efficient onboarding

process. The different together studies raise the importance of well-adjusted digital onboarding strategy to which this thesis work is partially aiming to answer. It is clearly recognised in number of studies that the more organisations implement and focus on onboarding activities, the more we can result in better work commitment and job satisfaction afterwards. In the target company the different time zones bring an amplifying factor to previously described phenomenon's, meaning in addition that team members are working remotely, geographically dispersed of each other's and due to time zone differences the correct supportive person might not be available when most critically needed.

It has been studied (in Denmark, compares relatively to Finland and other Nordic countries) that statistically 25 % of new hires leave their new job in first year, more than 50 % of new hires regret their decision, 20 % of new hires who decide to leave the company, will do it in first forty-five days and 4 % of people newer return after their first day. (Harpelund, C. et al. 2019, 15). This study further reinforces the assumption that the period of onboarding, both digital or traditional are crucial for having the later robust asset, the employee and to save the responsible recruiting line managers capacity and therefore company's turnover with other previously mentioned factors as well. Harpelund, C. et al. 2019 aligned with Saks et al. also studied that what is the average actual time to get onboarded – it is eight months in certain circumstances, meaning a big part of the groups listed above might find the negative feelings, partially due to lag of materialistic support before finding themselves as part of the organisation (socialisation, onboarding). Due to the COVID-19 pandemic a much uncertainty was recognised in the onboarding processes that has also led to an opportunity for re-evaluating the best HR (human resources) practices. (Fletcher, L. et al 2025, 8). Also, this thesis work partially exists because of COVID-19 pandemic. This is the process directly linked to company turnover as recognised and described previously, making it practically very valuable. Onboarding, as called as organisational socialisation is directly impacted by the design as well as the materials used, which has gained a great importance. Companies are increasingly motivated to find about decentralised onboarding methods than centralised methods. Surveys conducted in sales organisations have given the results of increasing expectations towards decentralised onboarding in future (Wiseman, P. et al. 2022, 13-14). The decentralisation means that whatever the subject is, the decision making and planning is not in a local authority but in dispersed locations or divided to smaller subfunctions and groups. Also target company Wärtsilä and its energy storage operations in question are motivated to find efficient ways of conducting onboarding as it has been clearly recognised being directly

affecting turnover by employee satisfaction and other factors as described previously, with the general trend pointing increasing portion towards remote working the previously placed factors further amplifies themselves. Wärtsilä ES&O business has also very decentralised functions which therefore highlights the importance of an individual team on maintenance management having their own onboarding process and materials even the skeleton or guidelines still comes from the bigger strategy.

Surveys are great way for evaluations the current state of teams in the organisation. For collecting the raw data from the target group, a questionnaire survey was decided to be designed and deployed. Questionnaire surveys as information collecting method can be used inside the organisation in question to acquire raw data, which are in this case the people's experiences, emotions and their commitment or satisfaction level, and to achieve a successful deployment of survey it needs to go through multiple pre-tests and the questions needs to be thoroughly weighted and details carefully evaluated. The variables that are going to be evaluated are very highly leaning towards qualitative methods as people's experiences are much different than quantitative values. It is mandatory that the research questions can be translated into plain survey questions for achieving most suitable response, meaning to have the most useful data with lowest possible number of errors or answers that was not understood like intended. Skipping some of above-mentioned tasks or taking shortcuts regarding pre-testing may lead to poor response data quality, which is not wanted as surveys are, at least in sense of professionalism a one-time off. (Arundel 2023, 2-6). Questionnaire topics can usually be categorised into three main classes; questions of facts, questions about behaviour and questions about opinions, judgements and beliefs (Gillham 2007, 26-27). The questions in the survey to be later deployed will focus on people's experiences and emotions, leading to exclusion of the questions of fact as clearly one's experiences or emotions can't be directly assessed as objective facts in interest of this thesis topic. The survey in question is a tool in descriptive study, meaning the questionnaire survey structure is also determined by its purpose (Willem, S. et al. 2014, 4-5). The purpose is to find about the general satisfaction level of employees and connection points for supporting the specified onboarding material, which would then eventually support the socialisation process. One of the main factors in this thesis is that the designer of the survey as well the initial idea for the handbook of maintenance planning was given by the same person making this thesis. This leads to the need of distinguishing the designer and thesis workers response in the survey and to the confirmation bias. This needs to be compared to other respondents of survey for having the

extracted responses and the confirmation bias evaluated. The questionnaire survey is placing questions relatively directly, meaning to ask what is needed, although the idea is also indirectly to inquire the support for the handbook in question, without directly placing such questions in the survey. This still doesn't downplay the importance of being careful though regarding the process of translating research questions to survey questions for having the clear questions, understood as intended and proposing the answers for the surveyor. The questions will also need to be evaluated from ethics point of view and that they don't make harm to anyone e.g., asking personal questions that can directly be linked to respondents' identity. There are certain processes, such as GDPR requirements and general guidelines for achieving this.

2.2 Growth

The ES&O (Energy Storage & Optimisation) business at Wärtsilä has been founded by acquiring a company called Greensmith based in United States.

Quotation starts:

“In 2016, Greensmith’s revenue was USD 32 million with over 40 employees. The transaction is valued at USD 170 million (enterprise value). Greensmith will operate as a business unit within Wärtsilä Energy Solutions providing both stand-alone energy storage as well as hybridized energy systems, control software, and integration expertise.

The acquisition will enable Wärtsilä to rapidly expand its footprint in the energy storage market globally and position itself as a premier energy system integrator. Growth in the energy storage market is expanding from the United States to new regions including the United Kingdom, Asia and Australia. When Wärtsilä engine plants are further optimized with energy storage, new sources of value can be offered to customers and partners. Also, the growing capacity of renewable generation, including solar PV, becomes more sustainable and attractive when integrated with advanced energy storage.

“The acquisition of Greensmith positions Wärtsilä as a global leader in energy system integration and hybrid solutions”, said Javier Cavada, President of Wärtsilä Energy Solutions. “Greensmith brings an unmatched track-record of software and systems integration capabilities, having delivered a third of all 2016 energy storage installations in North America. Wärtsilä’s global footprint with an extensive sales and service network, besides its proven EPC expertise, will create significant synergies and growth.”

As a proven energy storage solutions and software company, Greensmith has integrated and installed over 60 grid-scale systems including an 80MWh turn-key system recently deployed in California in under 4 months to address a capacity emergency. The company provides a full range of capabilities – from full turn-key solutions to design and integration services and a fifth generation software package (GEMS) that today supports multiple energy and power applications. Since 2013, Greensmith has also deployed five grid-scale systems in the PJM frequency regulation market (Pennsylvania, Jersey, Maryland power pool), the world’s largest wholesale market, and serves a growing number of independent power producers,

investor-owned utilities, and engineering procurement and construction companies around the world.

“The Greensmith team is excited and honored to become an integral part of Wärtsilä, a global leader in energy solutions”, said John Jung, Greensmith President & CEO. “With the accelerating growth in the energy storage market, as well as, the need for more integrated, intelligent hybrid energy solutions – the timing could not be better.””.

(Quotation ends)

(Wärtsilä, acquisition of Greensmith Energy Management Systems Inc. 2017).

As the main company Wärtsilä itself and its operation are old, firm and stable, the new acquisition and the adaptation process to it can be partially considered as a startup company. As the ES&O is now considered as a startup, it has already gone through and is going through some of the recognisable organisational growing pains as described previously by Flamholtz, (2015). Eurostat-OECD has proposed that a binary value for determining a company with high level of growth to be as following:

$$E_{t=0} \geq 10$$

$$\left(\frac{S_{t+3}}{S_t} \right)^{\frac{1}{3}} - 1 \geq 20 \%$$

where E stands for the number of employees at given time (t) 0 and S stands for company size which can be measured in sales or number of employees. The above determination has been widely recognised and used by many researchers. (Coad et al. 2024, 8-9). According to the indicators and definition above the Wärtsilä ES&O business can be recognised as a high growth firm (HGF) as the number of employees has been increasing annually more than 20 % by last three years. The companies recognised as HGF’s are ironically suffering from the challenges of growing pains more often than others since the growing pains are a phenomenon of a successful companies. The growing pains include characteristics such as insufficiency in developing the infrastructure of the organisation, resources, processes, systems and the culture. The failure of adapting the organisational functions for the growth will more possibly lead to the so-called growing pains. The more daily and recognisable characteristics are for example the changing job demands, need of rapid recruiting and changing leadership requirements. (Moedt et al. 2024, 2). The growing pains occur when as a

result of business growth, the above-mentioned organisation and its functions and specifically the development of them are not in balance with the growth. Practically this means that different supporting functions are yet to be developed, such as management systems, culture and operations. The employees might for example feel that they don't know where the company is targeting and because of lack of internal communications or lack of knowledge the targets might not be shared clearly and therefore employees might create their own networks and obtain the satisfying information for knowing the firm's direction. (Flemholtz et al. 2015, 96-76 & Häkkinen 2023, 45-46). Häkkinen describes the phenomenon from other perspective as the human brains and behaviour does not withstand very well the uncertainty (hunter gatherer reflection) of surrounding environment and therefore individuals start to develop explanations for achieving the certainty and safety. This can be reflected from hunter gatherers toolbox for this today's organisational environment and its individuals now knowing where the company might be heading and therefore individual might form the networks and produce answers which might not be absolutely true, but they will result in solution. This highlights the importance of organisational communications and the management of the different growing stages of company.

3 Methodology

This study meets the characteristics of a qualitative study as qualitative study analyses documents and writings in text form or fieldnotes or it considers one's own experience and observations in the target company. The words can be seen as the data of qualitative research. Mainly its characteristics are to obtain and analyse non numerical information and to understand individuals current or past reality, attitudes or motivation (Saldana et al. 2011, 4). As the reality, believes and attitudes are considered in later discussion as possible confirmation bias related to this thesis, meaning amplification of one's own existing believes and expectations or conversely, the search for counterarguments might not be very effective (Lidén 2023, 11 & Kappes et al. 2020, 133). This is recognised as one of the risks when one is influenced by the environment where they are working, and this might have an influence on the placed research questions and therefore the results, in this study, regarding how the questionnaire survey questions are formed. The qualitative study is trying to recognise relationships between different variables (Tisdell 2016, 5) e.g., in this thesis work do those with less experience need more support in their work than those with more experience, or are there other dimensions, when addressing the topic of materialistic support or is there similar deviations between variables such as age, gender, experience or country. The current and past working and onboarding experiences of persons are collected in this study and therefore the study prepares to analyse them as phenomenon and generalisations or finding patterns rather than working with exact quantitative numbers, which would be a clear element of quantitative study working with data. Some quantitative information, such as age or duration is used in the study, but they only form a small fraction of the content and therefore this study meets practically exclusively qualitative study characteristics. Mixed methodology (qualitative and quantitative) was also considered but not recognised strong enough to be classified as one.

The study focuses on group of people that work geographically dispersed and on different time zones, in practice on almost all the available time zones. What are their current and past experiences and emotions so far in their current position as maintenance planners and do they find, especially do younger persons career-wise find challenges that could be partially addressed by targeted digital onboarding material as the more matured individuals are assumed to have more experience-based comfortability already. This, however, can't exclusively be stated so. The execution of the questionnaire survey is based only in the hypothesis described previously, as there is a high assumption that the targeted onboarding

material can address the issues recognised by a small group of people and support or to objection against this assumption is collected from the target group with their response data, which is analysed to form the categories and themes out from the gathered information.

3.1 Qualitative research in the company environment

As the theory section summarises (Lauby, Brett, Harpelund, McPhail, Sani, Wiseman, Arundell, Gillham) generally the importance of well-defined digital onboarding program and material, it is therefore critical to reflect and to find support for the assumption that the specified handbook like material would bring more value to company by enhancing the onboarding process, increasing the job embeddedness and satisfaction to individuals daily work and reduce other weaknesses recognised in digital onboarding by different researchers above. To avoid the confirmation bias when evaluating the need and possibly strong support for the handbook of maintenance planning, the need and support for this must be justified and proved to avoid unnecessary work, if after the analysis the outcome is objecting the need of having the supportive material. The confirmation bias can be recognised afterwards while responding the survey and comparing the results for the average responses and finding the divergence.

The research questions, to recognise the need of supportive material, were chosen to be addressed by building a questionnaire survey and analysing the collected responses and progressing towards the conclusions made from the results. Surveys are for collecting information about or from people for having a description, comparison or explanation of groups knowledge, experience, behaviour or attitudes (Arlene 2003, 1). The research questions can be addressed by using this questionnaire survey alone (Arundel 2023, 10). Building a survey and collecting information if the Handbook-like material is needed is not exclusively a qualitative study. It becomes a qualitative study when the experiences of the employees are tried to be understood, and generalisations or patterns being formed out from their responses or relationships between variables to be understood. A very basic definition and recognisable feature of a qualitative study is when the qualitative study uses words as data, which is clearly recognisable in this thesis work. (Merriam, S. et al 2016, 6). The target company is moderately large which proposes more accurate results from the conducted questionnaire survey, meaning bigger expected response rate, as the survey group is already

under same email domain, in organisation hierarchy or team. Also, one of the most important factors having effect on the response rate is the respondent's interest in the survey questions, which is assumed to be moderate or high as the target group most probably have emotions directly related to their individual onboarding experiences and current job satisfaction. The respondent might have the need to give guidance for the onboarding new incomers and this is recognised as one of the risks if the respondents recognise where the survey is related. This is considered during the design phase of the questionnaire survey questions, leading to question design that directly does not reveal what it is about but rather indirectly collects the questions. Indirectness proposes other risks, such as questions being not clear leading to errors in responses, but these are tried to be mitigated during the survey testing period. The target group size is approximately 30 persons, and they work in different business lines in the company but in the same position. This brings value to the responses as the business lines can be distinguished from each other's if the individual group are big enough and therefore it can be seen if the different business lines have different needs regarding onboarding material or could similar material also bring value to every business lines operations. A questionnaire conducted recently through Wärtsilä Energy business had a response rate of 88 % which is a good expectation regarding this thesis questionnaire in question.

3.2 Designing the survey

The translation of research questions into survey questions is the area where commonly the mistakes can be made that lead to too many or difficult questions and will take too much time to answer, making the questionnaire unattractive and lowering the response rate or the accuracy, or just having the responses that does not answer the intended research questions. The research questions are designed to understand experiences, emotions, atmosphere and thoughts of the target group and then form generalisations and understand the phenomena that are currently present across the different maintenance planning teams. The questionnaire needs to be interesting and attractive for the respondents but at the same time stay neutral and not to have certain word connotations and it needs to be able to be completed within 15 minutes and the questions needs to be understood by every responder like it is intended for avoiding errors or bad word-data, expressed in other words the number of incorrect answers needs to be mitigated as well as possible. The data quality will decline if the respondents can't understand the questions due to use of jargon or other ways unnecessary complex language, or if for an example one question would contain two questions (term. double questions) leading

to uncertainty among the respondents to which question they responded or was the response somewhere between what meant. (Arundel 2023, 25-35). The target company is also multinational and consists of very heterogenic group of employees which further reinforces the previous statement that the survey questions must be understandable even for below average vocabulary or who are not native speakers of the language and considering the responders who might read the questions very quickly. The intention is to have the questions designed simple and short with a plain language and to keep the survey short enough to maintain the interest and to avoid the fast responses. The survey designers bias can influence the survey that leads the responder to a certain direction (Lidén 2023, 11) thought in the questionnaire in question the designers bias can be mostly visible on what is asked, rather than leading the respondent. Arundel 2023, 36 also explains the effect of biased questions in surveys, meaning if adjectives are used with desirable or with undesirable connotations, leading to more probably setting the tone for the responders to also answer with more negative or more positive attitude with the topic in question. This mentioned probability of the bias effect can be partially reduced by following the survey design process that proposes the survey to be tested “in-house” with target respondents prior to official deployment (Hai-Jew 2019, 5). As the surveyed group is quite small the in-house testing is also limited to smaller number of steps taken, evaluated further in the text. The designers bias can partially be visualised in the survey results when letting the designer to answer the survey and then separate the result from other respondent results. Similarly, then distinguishing the different business line results, it will show the varying result curves, or other visualisation, such as percentages and words. The target respondents group size for in-house testing is limited due to actual deployment group size being approximately 30 persons.

There are four commonly used survey methods: interviews on telephone, interviews in person, printed postal surveys and online surveys. The implementing process of all four survey methods are the same but the main differences come from the costs. (Arundel 2023, 78). The survey method chosen to be deployed in target company is the online survey as it's already confirmed that everyone is present in the email and organisational hierarchy, meaning the surveyed group is already there but just their attention still needs to be drawn to. As the chosen target group of interest is already highly connected to this survey environment (company and organisation) the respond rate is assumed to be relatively high which would have been in other scenarios one of the risks as people respond to different survey methods differently depending for example on age or socioeconomic position, Arundel states. Many of

the typical survey response rate related issues can be avoided when deploying an internal survey.

There are three common possibilities for sampling methods, a census, a probability sample and third non-probability sample. As the target group size is approximately 30 persons the census method is selected as there is possibility to survey all the individual persons due to group size. Census method means that it is not a sampling method but all the persons that match to the conditions are selected to be surveyed, in this case the different maintenance planning teams and the employees in them. The two other methods would have been more effective and time efficient for bigger survey group sizes. (Arundel 2023, 90-91).

Satisficing is a phenomenon when respondent encounter fatigue while answering towards the end of the questionnaire, or after some time after beginning the answer process. It is wise to reflect that the respondent does not have a clue to what they are responding to. They are just seeing the rows of boring questions. The respondent might have initially a great motivation to answer all the questions presented but if the interview, in whatever form it is held extends too much, the result is that the respondent became less thorough regarding the meaning of the question and might start to select the answers very haphazardly. The phenomenon does however happen stronger in remote interviews more than face to face interviews as there is possibility to focus on something irrelevant while answering. (Biffignandi, S. et al. 2021, 144-145). To increase the response quality the questions were thought to be fitting and specified for the maintenance planners. For keeping the respondent satisfied, the questionnaire survey was designed to have least possible number of questions but still giving the results containing the biggest amount of clear information that would also be distinguished in the analysis phase for finding the different patterns. The questionnaire survey contained four sections, starting from basic knowledge and progressing towards the knowledge management, however keeping the initial questions very simple to save the respondent cognitive ability towards the end of the questionnaire survey. During the in-house testing and afterwards observing the collected data, the response times were average of approximately 8 minutes, which is satisfactorily under the 15 minutes limitation proposed by Arundel previously.

3.3 Prior deployment testing

Testing the questionnaire before deployment is a mandatory part of the process. Without testing the questionnaire, it would high likely be deployed with more errors providing results, or just simple typing errors if only the survey designer was attending the testing phase. The questions might seem obvious and clear for their designer but is everything else for the respondents in worst case, which needs to be mitigated. There are three types of in-house testing. First phase is to test the questionnaire with your friends, colleagues or other experts working close to you. Second phase is to conduct a so-called cognitive testing of the survey, meaning 10 to 50 individuals randomly chosen from the population of interest (e.g., maintenance planners in target company). Pilot survey would contain 50 to 300 individuals. The first type of testing is considered easy but not less mandatory and most important. (Arundel 2023, 56-57). Due to the limited number of expected respondents, meaning, not small itself but too small to be worked through with all three previously mentioned pre-testing methods, the first one in carried out with the nearest company colleagues and friends who had experience in organisational communications of working with surveys previously.

The questionnaire survey was tested in-house with closest colleagues and friends, as well the test responding was conducted prior to the real deployment. The questionnaire survey contains 28 questions regarding job satisfaction and embeddedness, what kind of risks are recognised within the teams and how is the knowledge managed. The following corrective actions were taken before deployment:

- The questionnaire survey invitation date and time of sending was chosen to be Monday (if bank holiday, then next day) 11.00. This action was planned with communications specialist as during that day and time of the day it is common to have some free time in work.
- The introduction of the questionnaire survey was designed to have an emotionally connected text. It was regarding the experiences, past and present as well the connection that the respondent would be helping to complete a thesis work.
- The original questionnaire survey had question numbers which were removed for mitigating risk of “thinking too much” of how many questions there are left or for having thoughts of which section of questions this might be connected. The question number also was not found to have any added value. Instead of having the question

numbers, the average completion time of the survey was kept visible for the respondents to mitigate the risk of one might not think that they have not enough time to answer. 10 and 15 minutes already makes a difference, it was assumed.

- Typing and grammar errors were corrected, and some modifications were made so that the question was understood similarly by all the respondents and like they were intended to be understood.
- During the in-house testing phase, the average response time was approximately 8 minutes, which is satisfactorily under the previously proposed 15 minutes limitation by Arundel.
- For having more accurate responses, the middle point answer options were not taken into use. The following answer options are proposed, regarding only the questions where these are applicable:
 - Strongly agree
 - Agree
 - Disagree
 - Strongly disagree

It was estimated that removing the middle point option of “*not agree, not disagree*” could push the respondent to have an opinion instead of staying in the middle lane.

- There are multiple business lines in Wärtsilä and their visualisation in the questionnaire was found to be best as drop-down menu, for choosing the correct answer. Also, option “*other*” was taken into use for mitigating the risk of someone working elsewhere than within founded business lines.
- During the in-house testing and when giving test round responses it was recognised that peoples intuitively think the positive “strongly agree” answer option is at first. The options were vice versa at first and therefore the order was inversed. This was recognised as a clear error providing thing and a clear example
- The age group was given more freedom and the GDPR (General data protection) was taken into consideration. This meant to give response options as age groups instead of

exact number. Also, if there was highly unlikely answer, such as being over 65 years old or under 20 years old, the option for those was given as “>65, <20.”

- The questionnaire survey was also planned to have a two-week time window for responding and at middle point the reminder to be send for the pre-determined group.
- The method for deploying the survey was already chosen to be “online” but the actual method was the *Microsoft Forms*. This tool was already use in Wärtsilä, and getting used to work with it was moderately easy. Also, the branching option was present, meaning to have for example “if” -condition in the questionnaire survey for one question considering the general job satisfaction. This enabled the possibility of keeping a follow-up question hidden as needed according to the response.

3.4 Survey implementation and deployment

Prior to survey deployment the possible ethics and confidentiality dimensions need to be assessed, as well the survey won't do any harm to the respondents (Arundel 2023, 83) or at least it needs to be minimised (Leavy, P. 2020, 87). The survey questions do not contain confidential information, and the only low-risk ethical questions are the respondents age, country and business-line where individual is currently working or have worked as these could lead to traceability connection between the survey questionnaire and the individual respondent in question. The answer possibilities for the age question are however given as range e.g., 20-25 years for risk mitigation, like GDPR suggests. The questionnaire survey in question does not need to have separated ethical approval process, but the good practices are still to be followed. Meeting good practices will also be a positive factor in the response rate as the survey gives more trustworthy implication. (Lindorff 2010, 51-58). The survey respondents are identified with respondent numbers and no names are requested during the survey. However, it was found out that the *Microsoft Forms* does collect the respondent's name & email. The information will not be in any case forwarded to any third parties and when the academic need for the information comes into conclusions, the data will be deleted. This was stated in the introduction of the survey for gaining the trust like suggested by GDPR below.

Under GDPR rules the collecting of personal data (Article 4) in European Union countries, the rule requires to give the sampled individuals a description of the survey purpose:

“personal data means any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person, consent' of the data subject means any freely given, specific, informed and unambiguous indication of the data subject's wishes by which he or she, by a statement or by a clear affirmative action, signifies agreement to the processing of personal data relating to him or her;”. (GDPR 2016, Article 4.1, 4.11, 33).

In practise this leads that prior the survey deployment the group of respondents are informed about the questionnaire survey purpose and how and for how long the information is being stored. The regulation also states that the information can't be stored longer than needed.

The pre-determined group of surveyed (the maintenance planners) was therefore informed in the invitation email, and in the survey presentation that the information they are sharing are not used by third parties, their names are changed as identification numbers and when the university related purposes end, the data of surveyed group will be deleted. One of the most noticeable ethical considerations is also that the questionnaire is fully voluntary (Dunning, L. et al. 2023, 58). The incentive was emotions based as the respondents were helping with this thesis work (which was informed) in question as well possibly having effect on their own daily work later once the conclusions are drawn and possibly the composition of the handbook begins and later will be deployed. With all the taken precautions the GDPR rules are obeyed, by making the surveyed individuals unrecognisable and the exact responses, such as age, was changed to age groups and by informing the target group of the questionnaire survey purposes. The country of respondent was not found to be valuable information in this sense regarding the possible handbook of maintenance planning and therefore left out. However, that information, and the individual names and email addresses can still be found in the original data. They are not shared in the thesis work as they are not bringing any additional value and as well it was already stated, they are not handed over to any third parties.

3.5 Confirmation bias in the survey

Confirmation bias can be understood as a tendency to act selectively regarding the information one is working with. The selectiveness happens when ones existing believes or preferred conclusions receive a greater support, than the rest of the available options. This works also vice versa, meaning one might have predetermined conclusions and finding difficulties with the opposing information against the predetermined conclusions.

Confirmation bias happens subconsciously, it appears in many different contexts and can have, depending on where it is manifested, extreme consequences. (Lidén 2023, 11). The tendency to ignore negative instances and avoiding information that contradicts with ones existing believes is detrimental for acquiring new information. Example of this is the Texas sharp shooting fallacy, when after shot is made the marksman places the centre of target in the emerged bullet hole. This phenomenon is not avoided among the researchers as they have the tendency as well, known as HARKing, meaning the modification of the hypothesis after the results are known. (Glick 2017, 131). Brain researcher Jukka Häkkinen (2023, 45-46) describes this phenomenon as the Hunter-gatherers brain toolbox, meaning the situation of survival drives us to make conclusions that does not have to be true, but they offer the least stressful solution for continuing the activity. This can be connected to the suggestion of the modifying the hypothesis afterwards, that could possibly lead to a more favourable outcome among the academic environment or in the business environment and therefore allowing the continuation of current activity. By survival Häkkinen does not mean typically a life threatening situation as the times of hunting and gathering are in the past but for example if your party is losing the elections, after horrible accident, pandemic or not being chosen in the job that you applied, your brains cognitive process forms you the comfortable explanation for the situation at first – after time you can start to process and find information more objectively with the event in question as per the given examples. It is very important to notify that the none of the humans are free of the confirmation bias or hunter-gatherers brain features. The Hunter-gatherers brain toolbox is highly connected to multiple conspiracy theories as brains do not withstand uncertainty and have tendency to find an explanation for problems and those don't have to be objectively correct but to bring the satisfying result, as described above by Häkkinen and others.

As the process of confirmation bias is also present while this thesis work is being written the risk and connection of confirmation bias to research questions is recognised. One way to mitigate the confirmation bias is trying to find a preference-inconsistent recommendations,

which have higher potential in triggering critical thinking patterns. However, it has been found that preference-inconsistent recommendations might be less effective if one has some prior acquired knowledge. (Schwind, C. et al 2012, 2289-2290). Practically this means acknowledging one's confirmation bias and existing beliefs but trying to find and consider the available research information that might be against one's existing thoughts to trigger the critical thinking. First mitigation method is to recognise that the phenomenon is present all the time and in you as well in others. Other way of mitigation is known as COS, Consider the Opposite Strategy. This means that one must consider the contradictive information to one's current beliefs and assess the information critically and weight both possibilities prior making the final decision. (van Brussel et al. 2020, 1-4). There are other methods existing but the common sense regarding the topic is taking into consideration one's own thoughts and being critical with them and to compare them to vast amount of literature, preferring peer reviewed ones and after it make the decisions. Also, one initiative already given is to measure the confirmation bias by giving the test response with the real-world respondents. Not to give the test response of survey designer in advance to have it not affecting the hypothesis and therefore being guilty in the HARKing phenomenon mentioned previously, meaning the modification of hypothesis afterwards.

As confirmation bias is highly related to human emotions as well the research questions that are translated into questionnaire survey questions this leads to hypothesis that is the questionnaire designer trying to find answer to designers' own interests rather than the organisational needs. The answer is yes and no, and therefore other persons and the previously mentioned strategies are to be followed. The research questions that were translated into survey question are therefore needed to be critically inspected with the previously described in-house testing methods by Hai-Jew 2019, 5 and Arundel 2023, 56-57. By reflecting the literature against the presumption made earlier about the benefits of onboarding material, several new information was found and gathered in this work.

4 Results

The surveyed maintenance planners working at Wärtsilä are generally satisfied (87 %) with their happiness in their current positions and roles, however when surveying the risks they are recognising in their daily work, regarding how the knowledge is being stored or shared and how efficiently they could think new incomers could manage to absorb or embrace the new information related to maintenance planners role, there is moderately high (42 %) direct indication of having a supportive material in their work, where the processes and ways of working would be explained and stored. The indication in this chapter means the indication level of how clear it is visible that individual needs a supportive material in their daily work. In partially indicated section in the survey the indication for having a supportive material is recognised by 19 % of the employees. Taking into consideration the weights in each of the sections the conclusions show that at least every other of the respondent is recognising the need of having a handbook in their daily job. It is the materialistic support, a brochure for completing the maintenance planning tasks while working remotely and distant, as described in previous chapters. These values are collected as an average value of the group, not distinguishing the age or experience or business line where they work at. The different variables are reviewed and evaluated in the following sections and their connections to each other are tried to be recognised and understood.

4.1 Decoding of the responses

The responses were decoded as following. The answer options had variation of age group, business line, duration group in two categories, country (exact answer), and the recruitment path. Those mentioned above were part of the very basic knowledge that was inquired from the respondent which were not directly evaluated, but they can be separately reviewed if the base results suggest doing so and if additional value is recognised. Most of the questions were given an answer option of “high to low but now between”, in this questionnaire survey the ones listed below:

- *Strongly agree*
- *Agree*
- *Disagree*
- *Strongly disagree*

The decision of giving only four answer options was leaning to the need of avoiding the situation where respondents are deviating around the middle line without having a real opinion, which is beneficial for this survey. The “high to low but now between” pushes the respondent to form an opinion but it can be either soft or strong regarding agreement or disagreement with the argument in question.

After receiving the responses, the questions were extracted from *Microsoft Forms* to *Microsoft Excel* sheet for making the pre-categorising. Every one of the responses from group of “high to low but now between” were to be colour coded. This means for having a more visual and more easily processable form of responses. See figure 3. below. The intention is to show the colours but not the questions at this point, or answers as the questions are shared in the appendices separately. Please consider to not evaluate the colours as the thesis reader at this point as the columns of questions will be having sections of meaning which are explained during the analysis. The sections are divided into three categories further in the text.

Figure 3. Colour coding of the applicable answers.

The colour coded responses were calculated as answers of one respondent. This applies to one row of answers. The colour coding had the following logic below:

| | |
|-------------------------------------|---|
| Uncertainty recognised | Stronger indication towards the need of handbook like material |
| Minor uncertainty recognised | |
| Minor certainty recognised | |
| Certainty recognised | No indication towards the need of handbook like material |

Figure 4. Colour coding explanation.

The redder the indication colour was, the more uncertainty was present in response, when comparing the pre-determined question and how it is possibly linked to the need of having a handbook like material available. The greener the indication colour was, the “comfortable” the respondent was in the current situation and therefore they did not recognise a need for having the supportive material. The answers needed to be examined manually since “strongly agree” could mean uncertainty as well as certainty, depending on the question. The colours are the only thing forming the result.

The columns of questions have their sections explained below:

- Section 1. Measurement of the current job satisfaction in scale of "*Strongly agree* -> *Strongly disagree*" In respondents' individual environment. This has indirect connection whether a handbook like material could help raising the job satisfaction. This is mostly focusing if employee is satisfied on their current situation and had some questions which could possibly be reflected after examining the base results, if they suggest such. Also, this kind of basic information was recognised to be needed to reflect backwards if the actual knowledge and handbook demand related questions were suddenly varying for one individual.
- Section 2. Not applicable/linked.
 - The meaning of this is that only one of the questions (*Would you be interested in job rotation?*) did not have any recognisable connection to having the need of the handbook like supportive material. It could possibly still be reflected after examining the base results, if they suggest such. This section two could have been combined with the section one but decided to be kept separately.
- Section 3. This section is as the first section but leaning more heavily towards the job knowledge management. More indication if handbook like material is needed, meaning if the respondent continues to stay satisfied to their current situation, there is no indication towards the supportive material. In this section the questions introduced the use of tools in their daily work, and the material-based questions were brought in. Leaning more heavily means that around half of the questions were still satisfaction based, and other half related directly to knowledge management.
- Section 4. This section leans heavily or completely on job knowledge management and has the strongest indication to the demand of having a handbook like material available, if the responses suggest so. The colours are already at this point revealing (Figure 5.) the average atmosphere of the responses, meaning that when the last and second last sections had more knowledge management related questions, the colours are turning more dark (orange and red) instead of greenish colours, like during the first and third sections related to general satisfaction. A quick glance reveals that there are indications towards the assumption that a materialistic support is needed but also generally satisfied respondents and responses are seen between.

The image shows a screenshot of a questionnaire survey. The survey questions are arranged in columns, each with a color-coded header. The colors used are light blue, blue, light green, and yellow. Below the survey questions, there is a legend explaining the color coding. The legend is divided into two main sections: 'Current job satisfaction of respondent' and 'Job knowledge management'. It includes four sections (Section 1, Section 2, Section 3, Section 4) and explains how the color coding indicates the need for a handbook-like supportive material. Section 1 is light blue, Section 2 is blue, Section 3 is light green, and Section 4 is yellow. The legend also includes a note about decision-making sections and a footer about the data source.

Figure 5. Sections below the questions.

Now the sections with the colour coding are visible on the figure 5. above (light blue, blue, light green and yellow). The more the right or towards the end in the questionnaire survey the respondent went the more they were answering the questions that were strongly connected for having the need to a handbook like supportive material. The respondents were also recognising the need with some deviations between the respondent groups as will suggested further down in the analysis.

| Section 1. GREEN. | Section 1. LIGHT GREEN. | Section 1. ORANGE. | Section 1. RED. | Section 3. GREEN. | Section 3. LIGHT GREEN. | Section 3. ORANGE. | Section 3. RED. | Section 4. GREEN. | Section 4. LIGHT GREEN. | Section 4. ORANGE. | Section 4. RED. |
|-------------------|-------------------------|--------------------|-----------------|-------------------|-------------------------|--------------------|-----------------|-------------------|-------------------------|--------------------|-----------------|
| 5 | 3 | 1 | 1 | 3 | 0 | 1 | 0 | 3 | 2 | 2 | 2 |
| 9 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 3 | 3 | 0 | 3 |
| 1 | 6 | 1 | 2 | 2 | 2 | 0 | 0 | 3 | 3 | 4 | 2 |
| 6 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 6 | 3 | 0 |
| 4 | 3 | 2 | 1 | 1 | 2 | 1 | 0 | 1 | 6 | 2 | 0 |
| 4 | 4 | 1 | 1 | 3 | 0 | 1 | 0 | 1 | 3 | 4 | 1 |
| 4 | 1 | 2 | 3 | 1 | 3 | 0 | 0 | 3 | 3 | 3 | 0 |
| 3 | 6 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 2 | 6 | 1 |
| 6 | 3 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 7 | 2 | 0 |
| 5 | 4 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 7 | 1 | 1 |
| 7 | 1 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 6 | 3 | 0 |
| 5 | 3 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 6 | 3 | 0 |
| 4 | 3 | 1 | 2 | 1 | 1 | 2 | 0 | 2 | 3 | 2 | 2 |
| 4 | 5 | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 4 | 4 | 0 |
| 3 | 6 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 7 | 2 | 0 |
| 7 | 1 | 1 | 0 | 2 | 2 | 0 | 0 | 4 | 2 | 0 | 3 |
| 4 | 4 | 1 | 0 | 1 | 3 | 0 | 0 | 0 | 3 | 6 | 0 |
| 6 | 2 | 0 | 1 | 3 | 1 | 0 | 0 | 2 | 4 | 2 | 1 |
| 6 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 5 | 5 | 1 |
| 6 | 3 | 0 | 0 | 1 | 3 | 0 | 0 | 2 | 5 | 0 | 2 |
| 5 | 4 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 3 | 6 | 0 |

Figure 6. Calculating the responses.

On figure 6. above the extracted responses from the colour coded table presented in figure 3 previously. The sections 1, 3 and 4 (2 left out) mentioned previously had the exact same colourings than the figure 6. above for clarification but excluding the section no. 2 as it can't be evaluated regarding the topic in question (if supportive, a handbook like material is needed). The figure 6. reveals that the responses were calculated together in group of colour codes, the same than in figure 3 (green, light green, orange and red). The colours gave the indication for the demand of supportive material. The fourth section had strong indication, first section had just very minor and the middle in this sense, the third section had approximated middle point weight as indicator. The middle point is a qualitative estimation rather than quantitative exact value. These are generally not quantitative values but rather qualitative values and estimated to be on a such range, as the understanding of the employee's emotion, experiences and believes is the main task of the survey result analysis. The definition of qualitatively has been described in the beginning of this thesis work and how the survey analysis is therefore assessing people's emotions and experiences rather than quantitatively measurable values.

| | | | | | | | | | | | |
|---|------|---|-----|---|------|---|-----|---|------|--|------|
| 5,0 | 3,2 | 0,6 | 0,6 | 1,5 | 1,7 | 0,7 | 0,1 | 1,0 | 4,2 | 2,9 | 0,9 |
| 8,1 | | 1,2 | | 3,2 | | 0,8 | | 5,2 | | 3,8 | |
| 53 % | 34 % | 7 % | 7 % | 38 % | 43 % | 17 % | 2 % | 12 % | 47 % | 32 % | 10 % |
| 87 % | | 13 % | | 81 % | | 19 % | | 58 % | | 42 % | |
| 87 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 13 % of the surveyed employees are not happy or just partially satisfied with their current situation. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 81 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This section started to include a daily tools related or knowledge management related questions. | | 19 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section started to include a daily tools related or knowledge management related questions. | | 58 % of the surveyed employees are very happy or mostly happy in their current situation. This section included only job knowledge management related question and their outcome has the stronger indication of having supportive material. | | 42 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section included only job knowledge management related question and their outcome has the stronger indication of having supportive material. | |
| Section 1. | | | | Section 3. | | | | Section 4. | | | |

Figure 7. Average extraction.

On figure 7. above the conclusions of one group (the average response of all respondents) can be seen. The figure 7. is aligned with the figure 6. and leading to following interim conclusions, or final in this group in question and under evaluation:

- Section 1. 87 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This is mostly distinguished from the need of having a handbook like material but has minor or partial connections to it. Notice that the greenish and reddish values are counted together instead of distinguishing the green and light green values, which would be standing for “*Strongly agree*” or “*Agree*”. Similarly, than for greenish values, the logic applies to reddish values.
- Section 1. 13 % of the surveyed employees are not happy or just partially satisfied with their current situation. This is mostly distinguished from the need of having a handbook like material but has minor or partial connections to it.
- Section 3. 81 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This section started to include a daily tool used related or knowledge management related questions.
- Section 3. 19 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section started to include a daily tool used related or knowledge management related questions.
- Section 4. 58 % of the surveyed employees are very happy or mostly happy in their current situation. This section included mostly or only job knowledge management related question, and their outcome has the strongest indication of having supportive material.
- Section 4. 42 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section mostly or only included only job knowledge management related question, and their outcome has the strongest indication of having supportive material.

4.2 Decoding the variables

Decoding and extracting the variables, such as age, experience or business line where each of the respondents are currently employed are providing deviations which are addressed on following sections and in the conclusion’s chapters. Below on figure 8. the business line of ES&O (Energy Storage & Optimisation) are extracted and their general happiness to the team and company is at level of 98 % and their strong recognition on the need of having a handbook like material is around 40 %, when taking into account the section 3 & 4 that had partial (section 3) and strong indication (section 4) on the need of having the supportive material. Only 4 % recognises a strong need on such a material and 31 % moderately high. The ES&O is the most important business line which the effort has been focusing while this thesis work has been written. It is a moderately new organisation and developing with a fast pace with all the phenomenon’s present in the environment which has been assessed in previous chapters.

| | | | | | | | | | | | |
|---|------|--|-----|---|------|---|-----|---|------|--|-----|
| 4,4 | 4,4 | 0,2 | 0,0 | 0,8 | 2,4 | 0,8 | 0,0 | 0,0 | 5,8 | 2,8 | 0,4 |
| 8,8 | | 0,2 | | 3,2 | | 0,8 | | 5,8 | | 3,2 | |
| 49 % | 49 % | 2 % | 0 % | 20 % | 60 % | 20 % | 0 % | 0 % | 64 % | 31 % | 4 % |
| 98 % | | 2 % | | 80 % | | 20 % | | 64 % | | 36 % | |
| 98 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 2 % of the surveyed employees are not happy or just partially satisfied with their current situation. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 80 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This section started to include a daily tools related or knowledge management related questions. | | 20 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section started to include a daily tools related or knowledge management related questions. | | 64 % of the surveyed employees are very happy or mostly happy in their current situation. This section included only job knowledge management related question and their outcome has the stronger indication of having supportive material. | | 36 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section included only job knowledge management related question and their outcome has the stronger indication of having supportive material. | |
| Section 1. | | | | Section 3. | | | | Section 4. | | | |

Figure 8. ES&O extraction.

When extracting and evaluating the variable “*experience in the company*”, the short experience in the company increases the demand of having a supportive material just marginally. Other clearer deviation is the general happiness towards the company and the current environment, which is moderately higher than the average group (87 %, 95 %).

| | | | | | | | | | | | |
|---|------|--|-----|---|------|---|-----|---|------|--|-----|
| 5,0 | 3,6 | 0,4 | 0,1 | 1,4 | 1,9 | 0,6 | 0,1 | 0,5 | 4,6 | 3,1 | 0,8 |
| 8,6 | | 0,5 | | 3,3 | | 0,8 | | 5,1 | | 3,9 | |
| 55 % | 40 % | 4 % | 1 % | 34 % | 47 % | 16 % | 3 % | 6 % | 51 % | 35 % | 8 % |
| 95 % | | 5 % | | 81 % | | 19 % | | 57 % | | 43 % | |
| 95 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 5 % of the surveyed employees are not happy or just partially satisfied with their current situation. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 81 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This section started to include a daily tools related or knowledge management related questions. | | 19 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section started to include a daily tools related or knowledge management related questions. | | 57 % of the surveyed employees are very happy or mostly happy in their current situation. This section included only job knowledge management related question and their outcome has the stronger indication of having supportive material. | | 43 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section included only job knowledge management related question and their outcome has the stronger indication of having supportive material. | |
| Section 1. | | | | Section 3. | | | | Section 4. | | | |

Figure 9. Short experience extraction.

On figure 10. below the persons who have worked longer in the company are recognising a weaker need for a supportive material in their current environment. Other visible difference is that the employees who have spent less time in the company, are generally happier in their current situation than the employees with longer time spent in the company. The long experience consists of two groups; 5-10 years and more than 10 years in the company, while the short experience consists of two groups, 1-3 years and less than one year in the company.

| | | | | | | | | | | | |
|---|------|---|-----|---|------|--|-----|--|------|---|------|
| 5,5 | 2,4 | 0,8 | 0,9 | 1,1 | 1,9 | 0,9 | 0,1 | 1,5 | 4,5 | 2,1 | 0,9 |
| 7,9 | | 1,6 | | 3,0 | | 1,0 | | 6,0 | | 3,0 | |
| 58 % | 25 % | 8 % | 9 % | 28 % | 47 % | 22 % | 3 % | 17 % | 50 % | 24 % | 10 % |
| 83 % | | 17 % | | 75 % | | 25 % | | 67 % | | 33 % | |
| 83 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 17 % of the surveyed employees are not happy or just partially satisfied with their current situation. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 75 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This section started to include a daily tools related or knowledge management related questions. | | 25 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section started to include a daily tool related or knowledge management related questions. | | 67 % of the surveyed employees are very happy or mostly happy in their current situation. This section included only job knowledge management related question and their outcome has the strongest indication of having supportive material. | | 33 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section included only job knowledge management related question and their outcome has the strongest indication of having supportive material. | |
| Section 1. | | | | Section 3. | | | | Section 4. | | | |

Figure 10. Long experience extraction.

In figure 11. below the age group of 26-35 years old was extracted from the raw data. 57 % of the respondents belong to this age group. When comparing the younger age directly to the shorter duration of time spent in the company, it shows that the younger age group is recognising similar connection of having a supportive material available. 45 % of younger employees recognise the stronger need, as the shorter experience in the company recognises 43 % need. The difference in general happiness in their current environment the difference is slightly bigger (95 %, 81 %).

| | | | | | | | | | | | |
|---|------|---|------|---|------|---|-----|--|------|---|-----|
| 4,1 | 3,7 | 0,8 | 1,0 | 1,5 | 1,8 | 0,8 | 0,0 | 1,1 | 3,8 | 3,3 | 0,8 |
| 7,8 | | 1,8 | | 3,3 | | 0,8 | | 4,9 | | 4,1 | |
| 43 % | 38 % | 9 % | 10 % | 38 % | 44 % | 19 % | 0 % | 12 % | 43 % | 36 % | 9 % |
| 81 % | | 19 % | | 81 % | | 19 % | | 55 % | | 45 % | |
| 81 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 19 % of the surveyed employees are not happy or just partially satisfied with their current situation. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 81 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This section started to include a daily tools related or knowledge management related questions. | | 19 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section started to include a daily tools related or knowledge management related questions. | | 55 % of the surveyed employees are very happy or mostly happy in their current situation. This section included only job knowledge management related question and their outcome has the strongest indication of having supportive material. | | 45 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section included only job knowledge management related question and their outcome has the strongest indication of having supportive material. | |
| Section 1. | | | | Section 3. | | | | Section 4. | | | |

Figure 11. Age group of 26-35 extraction.

In figure 12. below the age group of 36-65 years old was extracted from the raw data. The comparison between the younger and older respondent age groups shows the difference in the need of having a supportive material in their daily work. Younger employee group recognises a value of 45 % strong need for the supportive material, as among the older group of employees the strong need value of having the supportive material is 37 % which is slightly smaller but an expected result when comparing the already achieved results.

| | | | | | | | | | | | |
|--|------|---|-----|--|------|--|-----|---|------|---|------|
| 6,1 | 2,6 | 0,3 | 0,1 | 1,6 | 1,7 | 0,6 | 0,2 | 1,0 | 4,7 | 2,3 | 1,0 |
| 8,7 | | 0,4 | | 3,2 | | 0,8 | | 5,7 | | 3,3 | |
| 67 % | 28 % | 4 % | 1 % | 39 % | 42 % | 14 % | 6 % | 11 % | 52 % | 26 % | 11 % |
| 95 % | | 5 % | | 81 % | | 19 % | | 63 % | | 37 % | |
| <p>95 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This is mostly distinguished from the need of having a handbook like material but has partial connections to it.</p> | | <p>5 % of the surveyed employees are not happy or just partially satisfied with their current situation. This is mostly distinguished from the need of having a handbook like material but has partial connections to it.</p> | | <p>81 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This section started to include a daily tools related or knowledge management related questions.</p> | | <p>19 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section started to include a daily tools related or knowledge management related questions.</p> | | <p>63 % of the surveyed employees are very happy or mostly happy in their current situation. This section included only job knowledge management related question and their outcome has the strongers indication of having supportive material.</p> | | <p>37 % of the surveyed employees are not happy or just partially satisfied with their current situation. The section included only job knowledge management related question and their outcome has the strongers indication of having supportive material.</p> | |
| Section 1. | | | | Section 3. | | | | Section 4. | | | |

Figure 12. Age group of 36-65 extraction.

4.3 The extracted variables and evaluating the confirmation bias

As mentioned in the confirmation bias chapter by multiple researchers, the intention is not to guide the respondent to give the answers that the designer wants to hear but to have a question designed with neutral wording and not using the suggesting or absolute language and connotations or manifestation of anything. The one way of mitigating the confirmation bias is to reflect the results to available literature and to use the strategy of COS (Consider the Opposite Strategy). This means to accept the information in best way possible that is contradicting with ones existing believes. In figure 13. below the response of the survey designer is brought visible and the difference to the average can be seen. The designer is generally fully happy to his current environment and his daily job and is having the satisfaction and the feeling of the embeddedness to his job. However, when comparing the need of having the supportive material in the survey designers' daily job as a maintenance planner, the need of having the supportive material is very high, 78 %. It is assumed to be higher than the other as the whole idea of having the handbook of maintenance planning is his invention. This reveals and underlines the importance of the scientific evaluation that needs to be conducted prior to applying one's own thoughts affecting the whole organisation, such as composing a handbook like material, if there is not recognised demand of having one studied. In worst case, composing such a material would be wasting time and money of the company.

| | | | | | | | | | | | |
|--|------|--|-----|---|------|---|-----|--|------|---|------|
| 3,0 | 6,0 | 0,0 | 0,0 | 0,0 | 3,0 | 1,0 | 0,0 | 0,0 | 2,0 | 6,0 | 1,0 |
| 9,0 | | 0,0 | | 3,0 | | 1,0 | | 2,0 | | 7,0 | |
| 33 % | 67 % | 0 % | 0 % | 0 % | 75 % | 25 % | 0 % | 0 % | 22 % | 67 % | 11 % |
| 100 % | | 0 % | | 75 % | | 25 % | | 22 % | | 78 % | |
| 100 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 0 % of the surveyed employees are not happy or just partially satisfied with their current situation. This is mostly distinguished from the need of having a handbook like material but has partial connections to it. | | 75 % of the surveyed employees are very happy or mostly happy in their current job satisfaction. This section started to include a daily tools related or knowledge management related questions. | | 25 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section started to include a daily tools related or knowledge management related questions. | | 22 % of the surveyed employees are very happy or mostly happy in their current situation. This section included only job knowledge management related question and their outcome has the strongers indication of having supportive material. | | 78 % of the surveyed employees are not happy or just partially satisfied with their current situation. This section included only job knowledge management related question and their outcome has the strongers indication of having supportive material. | |
| Section 1. | | | | Section 3. | | | | Section 4. | | | |

Figure 13. Confirmation bias.

The figure 14. below visualises the confirmation bias. The clear and strongest difference has been regarding the questions about knowledge management (section 4.) in the questionnaire survey that were indicating towards the need of having the supportive, a handbook like material available. The effect of knowing the questions and intention in advance makes a significant confirmation bias regarding the topic and underlines the already mentioned importance of making the evaluation of whole organisation to mitigate ones existing beliefs if they turn out to be not realistic or matching the current organisational situation. The need for having a supportive material, like handbook is recognised by many but not as strong as the designer of the survey has thought in advance. The difference to average responses is shown by the yellow arrows compared to the average answers (black horizontal line).

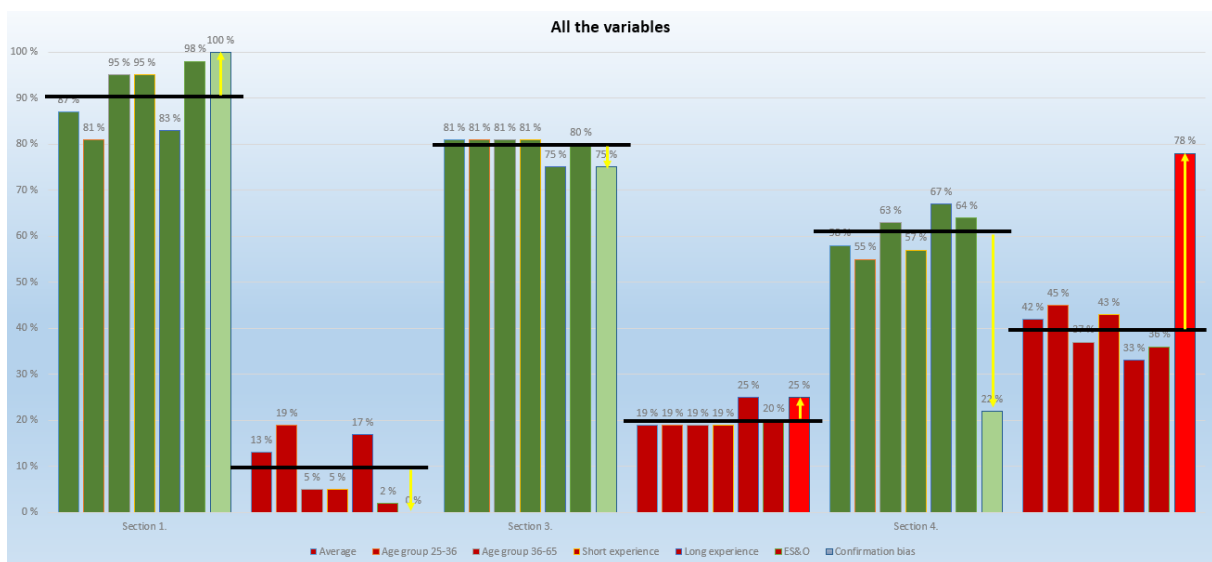


Figure 14. Confirmation bias comparison to average responses.

4.4 Response rate

The survey was deployed to each of the pre-determined respondents working in the different maintenance planning teams at pre-determined date and time of sending described and definition explained previously. The respondents were not aware that the survey was being deployed before the invitation email, which explained the purpose of the questionnaire survey and data protection methodology described previously. The survey was deployed in two phases, first phase to send the initial invitation for each of the respondent at each of their local pre midday time on Monday for having the response process initiated. If Monday was a bank holiday, the following day was used, at the same local time 11.00. for each or the respondents.

The questionnaire was open for the possible respondents for two weeks and on middle of that, after first week, the reminder email was sent to all the pre-determined respondents, which was the second case. As the *Microsoft Forms* collected data that was not purposeful, it turned out being one as the reminders was not needed to be send twice. The response rate of these two phases led to following results:

- First round resulted of 42 % response rate.
- Second round resulted of 81 % response rate.

The response rate was considered very high after the second phase. This was also assumed to be happening as the questionnaire survey was very much related to each of the respondents and their daily work, emotions and experiences, as well all the individuals were working in the same company. The very high, not directly connected topic had a response rate of 88 % that resulted in separate questionnaire in the same company, so the expectations were also moderately high regarding this questionnaire survey in question. The reminder message is generally recognised as an effective way of improving the response rates of surveys, from the methods that survey deployer can generally have an effect. Other recognised factors are for example the survey design, topic, participants motivation. Generally, the response rate has increased in surveys. (Holtom, B. et al 2022, 1560-1584).

4.5 Ineligible responses

Some of the respondents did have obviously too long answering time or too short answering time, meaning the answer options were most probably not read. The two very extreme duration were 4 hours 18 minutes and 6 seconds, while the other very extreme end was only 9 seconds. However, the longer answer was included in the final evaluation, while the 9 second answer was left out for obvious reasons when comparing to the 8 minutes 54 seconds average response time. In the average response time only the obvious two responses given above was left out as they distort the average time calculation. This is called as the phase of filtering the results which was only a minor task in this case.

4.6 Recognised variables

The pre- and after recognised variables were identified as age group, experience, time spent in company or business line related. More variables were available, such as gender but it was intentionally left out as it was not recognised for bringing any value. The variables were used to identify any connections between each other and this made is possible to have a more comprehensive evaluation as well gaining the trust towards the raw information. Also, a valuable experience was recognised as some of the existing believes were objected during the evaluation process while finding the interacting variables.

5 Conclusions

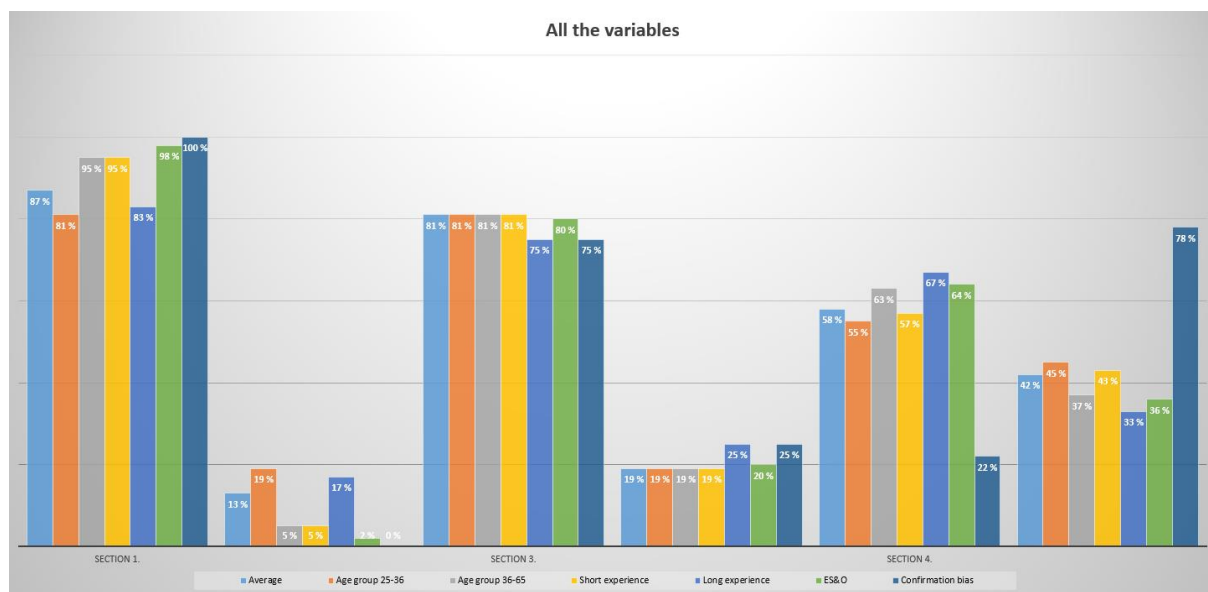


Figure 15. All the variables without highlighting.

As the figure 15. above shows all the variables distributed, the table 1. further below is summarising the results of the survey with the already familiar colour coding from previous sections. The green indicates comfort and certainty towards the current situation while red is indication of discomfort, uncertainty and need for supportive material (further below). The red and green areas are linking together the actual two greenish areas and two reddish areas from the previous reviewed figures 7-13. When evaluating the final results, the smallest need for having the supportive material, such as the handbook for the maintenance planning is among the employees who have worked the longest in the company. However, the previous statement does not mean that there is not indication for the demand of having one, it is just smaller than among the younger and less experienced employees.

When comparing the variable called ES&O (Energy Storage & Optimisation, one of the business lines of Wärtsilä), the same organisation where the questionnaire survey designer works, the need of having the handbook of maintenance planning is second lowest of the evaluated extraction groups. By extraction it is meant the variables, or the group under evaluation. The need of having the handbook of maintenance planning is not low in any of the extraction groups but rather it could be expressed to have the demand in different level of

clearly recognised or moderately recognised demand. More than every third of the ES&O group respondents would feel it beneficial to have the handbook in their daily work.

When comparing the younger employees from the age group of 25 – 36 years old the strong indication column is showing a value of 45 % of the respondents would feel that it is beneficial to have the handbook of maintenance planning. Also noticeable is that the same group (age 25 – 36 years) is having the general satisfaction level towards the company or organisation the lowest of the compared, 81 %. That is 6 % lower than the average level of satisfaction. However, the older the employee is, the weaker they are recognising the need of having the handbook of maintenance planning but when comparing how satisfied they are towards the company, the value is also quite high at 95 %. The longer the experience in the company seems to be stronger is the factor driving the general satisfaction downwards in their current environment, not the age of the respondent itself.

Clearest evidence for having the supportive material is coming from the groups “*short experience*” and “*age group 25 – 36*”. This could also be common sense that the younger and less experienced the employee is, the more support is needed but valuable notification is that among the oldest and most experienced employees, the need of having the handbook of maintenance planning is still recognised, not just as strong as among the other groups. The deviation between the business lines also has noticeable distinguishment in the general satisfaction towards the current environment but not a major difference regarding the need of having a handbook of maintenance planning (36 %, 40 %). The difference regarding the confirmation bias row values is major, when evaluating the strong indication section to other extracted groups, which was assumed to be happening and that is more profoundly reviewed in previous chapter.

Table 1. Deviation between the variables.

| Extraction | Minor indication | | Moderate indication | | Strong indication | |
|-------------------|------------------|------|---------------------|------|-------------------|------|
| | | | | | | |
| Long experience | 83 % | 17 % | 75 % | 25 % | 67 % | 33 % |
| ES&O | 98 % | 2 % | 80 % | 20 % | 64 % | 36 % |
| Age group 36 - 65 | 95 % | 5 % | 81 % | 19 % | 63 % | 37 % |
| Energy services | 80 % | 20 % | 75 % | 25 % | 60 % | 40 % |
| Average | 87 % | 13 % | 81 % | 19 % | 58 % | 42 % |
| Short experience | 95 % | 5 % | 81 % | 19 % | 57 % | 43 % |
| Age group 25 - 36 | 81 % | 19 % | 81 % | 19 % | 55 % | 45 % |
| Confirmation bias | 100 % | 0 % | 75 % | 25 % | 22 % | 78 % |

Other business lines do exist at Wärtsilä, but the respondents of those individual group were so minor that the error probability is considered too high for creating a purposeful evaluation. It can be however extrapolated that the level of having a handbook of maintenance planning remains at the level with other business lines as well as the common company strategy does influence everyone.

5.1 Possible errors in the survey

As previously addressed, the translation of the research questions to survey questions is the most common way of creating error in the survey responses. There will always be a balance and trade-off between not designing a questionnaire survey too lengthy as well how to include all the mandatory survey questions at the same time. The error might emerge if the researcher was not able or did not carefully enough evaluate the survey questions and if the in-house testing phase or phases, if the target group is big enough, was passed or neglected. There is also a recognised risk of placing additional items, or questions in the survey that does not bring any additional value and therefore increases the fatigue of the respondent and therefore the risk of respondent will not carefully answer all the items if the survey is unnecessarily lengthy. (Arundel 2023, 4-6 & Kulas, J. et al. 2019, 856-858).

As in the literature and theory sections the risks, possible issues were carefully thought, recognised and reflected against the available literature connected to creating surveys, many of the risks were possibly avoided before they came into effect. The main elements of errors in designing of the surveys are listed below:

- Translation of the research questions to survey questions. It is mandatory to have the high-quality responses, meaning the participants are understanding the questions like they are intended, regardless of their background, native language or age.
- In-house and pre-testing of the survey. This is a mandatory step prior to the survey deployment. The survey questions may be perfectly reasonable and obvious to the survey designer but are entirely something else to the survey respondent.
- The in-house testing with friends, colleagues or if applicable, for a test group will reveal any typing errors, inconveniences, such as the order or answer options, or if the

questions contain double questions and if the questions can be understood incorrectly. This will have a major effect on the response data quality.

- Confirmation bias needs to be recognised. What is the survey designer's intention with the survey and does they lead the participant to respond in certain way with the use of certain connotations in the language or proposing the arguments with negative or positive way. Confirmation bias has also a form of prestige bias mentioned by Kulas, J. et al. 2019, 856-858, meaning that an individual might have personal desire to be seen in a positive light among the company, or other social group. The individual might not be aware of this and therefore the designing of the survey might drift to a certain direction.
- The surveys need to be ethically plausible, meaning to be transparent, informative with the purpose of the survey etc. This has also been recognised for increasing the response rate of surveys generally as the ethically evaluated survey gains more trust and it has, depending on survey and region a GDPR based requirements which are to be obeyed.
- The error might also emerge if the surveyed group is too small. A response of one individual might have too strong effect on the groups average level and therefore the response can not be qualified for further evaluation. In this thesis and the questionnaire survey, the estimated response group size consisting of maintenance planners was 30 individuals. 26 was found to be qualified and with response rate of 81 % 21 out of 26 surveyed gave their response for the questionnaire survey.

5.2 Proposal

When measuring the current state of the general happiness of the individual or the level of safely conducted knowledge management among the individuals, there is clear recognisable evidence that a supportive material is needed regardless, not totally but plausibly, among all the respondent groups. The deviations between groups, mostly regarding the experience and age are not major so it can be stated the need is recognised by all.

As reflecting backwards, the theory sections and the framework, the importance of a properly executed onboarding program can't be neglected as doing so, it increases the risk of negative organisational outcomes effecting the economical situation and effectiveness of the company. Therefore, as the initial idea suggest having the onboarding material, specified for the maintenance planners could bring benefits for the different teams, the composing of the handbook of maintenance planning is proposed by this thesis work. It does, with high probability give benefits in form of reducing the previously mentioned risks in remote working and geographically dispersed organisation. Referring to the figure 1. the conditional step between the thesis and the company boundaries is fulfilled and the second phase can be initialised.

5.3 Further development

As the composition of the handbook of maintenance planning is given the clear proposal it is also valuable to evaluate the form and scope of the handbook that could satisfy the needs of the group of maintenance planners. The same principals are most probably to be followed than with the questionnaire survey – the handbook can't be long enough to cause fatigue among the readers. The ES&O organisation has been in rapid growth, as mentioned previously, which also makes the risk of handbook being out of date a recognised risk as the ways of working does change along the organisational journey.

Possibly, a dedicated person does need to stand behind the handbook and the updates of it for keeping it functioning properly and being a plausible and trustful source of information. It does not reduce the risks of onboarding if does not serve its intended purpose.

The questionnaire survey and they platform for conducting it was recognised a pleasant task for the respondents as well the designer during this thesis work and therefore it is one

possibility to be used once again, when evaluating the need of having the update or change of style in the composed handbook of maintenance planning.

One of the recognised errors providing factor was the number of respondents and the response rate. As the organisation is estimated to be growing in near future the number of respondents will also increase with high probability. This increases the quality of responses and gives the possibility to implement other pre-testing methods prior the questionnaire survey launch.

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Appendices

Appendices (1 & 2) are containing individuals' personal information. They are available and can be reviewed during the thesis evaluation process but as the academic need disappears the data will be deleted. This is to comply with GDPR of EU.

Figures and tables

- Figure 1. Thesis process and boundaries.
- Figure 2. Newcomer work engagement process and different outcomes (Saks et al. 2018, 15).
- Figure 3. Colour coding of the applicable answers.
- Figure 4. Colour coding explanation.
- Figure 5. Sections below the questions.
- Figure 6. Calculating the responses.
- Figure 7. Average extraction.
- Figure 8. ES&O extraction.
- Figure 9. Short experience extraction.
- Figure 10. Long experience extraction.
- Figure 11. Age group of 26-35 extraction.
- Figure 12. Age group of 36-65 extraction.
- Figure 13. Confirmation bias.
- Figure 14. Confirmation bias comparison to average responses.
- Figure 15. All the variables without highlighting.
- Table 1. Deviation between the variables.

Appendix 1 & 2

- Questionnaire survey questions
- Questionnaire survey responses and scoring