CHALMERS
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Efficient Communication within Transport Operations

Master's thesis in Quality and Operations Management

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CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2021
www.chalmers.se
Report No. E2021:108

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Abstract

Electronic mail is one of the traditional tools anchored in many organisations, and due to this, email communication takes up many working hours, and people feel overloaded with electronic mail. The purpose of the study is to analyse the usage of electronic mail and identify potential improvements by using other communication tools. A case study was conducted at Transport Operations Europe, TOE, an operational function within *Volvo Group* that communicates through email to perform their operational tasks.

The study performed interviews and focus groups and analysed data from mailboxes to understand the effects of using email. Further, benchmarking and focus groups were performed to investigate and evaluate additional communication tools applicable for businesses. A literature study was conducted to extract existing information around communication and communication tools.

The analysis was done in two phases due to the extensive data collected. The study found that there were two different types of mailboxes used; personal and shared. The effects of using email were increased possibility of information overflow and email overload, and consequently, it is hard to keep control over all the emails due to manual handling. It was also found that email had limited accessibility, visibility, and traceability of information.

The study found that phones, SMARP, and ticket systems were applicable tools for business communication. The ticket system was the only communication tool that showed promising improvements to the issues found with using email. The ticket system decreased information overflow and email overload. Further, it enabled more control due to the high automation level and increased the accessibility, visibility, and traceability of information.

Keywords: Email, Information, Communication, Business communication, Communication tool, Communication channel, Information overflow, Email overload, Transport operation

Acknowledgment

We want to thank *Volvo Group* and *Chalmers University of Technology* for the opportunity to perform this study.

A special thanks to Maria Andersson and Lukasz Olechnowicz from *Volvo Group* for all the time and effort spent to guide and support us throughout the whole process. Their support gave us help in what direction the study should undertake to achieve exceptional results in a short period. We would also like to thank department managers and operational workers at *TOE* for participating in interviews, focus groups, and for answering additional questions. Also, big thanks to the benchmarking company for all the information regarding their communication tool.

We would also like to thank our supervisor Gunnar Stefansson for all the help with the study's structure, writing, and direction.

Nathalie Käll and Kevin Wedin, Gothenburg, June 2021

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Acronyms

CC - Carbon Copy

CMC - Computer-Mediated Communication

DM - Department Manager

FW - Forward

GTO - Group Trucks Operations

ICT - Information and Communication Technology

MMU - Mixed Mailbox User

OW - Operational Worker

PL - Production Logistics

PMU - Personal Mailbox User

SMU - Shared Mailbox User

RE - Reference

RQ - Research Question

TOE - Transport Operations Europe

1. Introduction

The following chapter is presenting the background of the study that indicates the relevance of the research topic. Further, the purpose of the study is presented, and the research questions to be answered are shown. At the end of this chapter, a description of the limitations concerning this study is presented.

1.1 Background

Nowadays, digitalization is considered as one of the global trends affecting businesses (Brennen & Kreiss, 2016; Liao et al., 2017). Bloomberg (2018) defines *digitalization* as, how social domains are transformed to fit within the digital media and communication infrastructures. The advancements of digital technology are described by Legner et al. (2017) as waves, where each wave has fundamentally shaped society and business.

The first wave resulted in more automated work routines where digital variants replaced physical paper (Legner et al., 2017). The internet entered as a global communication infrastructure during the second wave, which changed companies' value creation logic, and new businesses emerged such as e-commerce and third-party involvement of intermediaries. Society is today undergoing the third wave that affects some specific industries as previous waves have. It affects the environment for all industries, consumers, users, and citizens. Social platforms, mobile technologies, data analytics, and cloud computing technologies have become important during this wave. There is also a continual expansion of storage capacity, processing power, and communication alternatives (ibid.).

According to Kilpeläinen and Tyrväinen (2004), digitalization has created a tremendous amount of opportunities for businesses in terms of communication management and information technology. If the new technology has been implemented without further consideration of its impact, there is a risk of missing the implementation's best exploitation possible (ibid.). Information technology has reduced the need for face-to-face communication (Kilpeläinen & Tyrväinen, 2004; Carr & Kaynal, 2007). Digital documents have contributed with increased functionalities followed up with reduced cost and higher quality (Kilpeläinen & Tyrväinen, 2004). These properties have led companies to use digital documents as their major source to distribute and handle information (ibid.). According to Carr and Kaynal (2007), more advanced methods to communicate have been introduced in the form of electronic devices and tools due to technological advancements that increase the utilisation of computers. Kilpeläinen and Tyrväinen (2004) state that even though digitalization has significantly benefited companies' communication, some drawbacks include information overflow. Information overflow emerges from the high availability of all kinds of information. The organization's communication can be weakened when its users overly distribute information or emails are sent or forwarded to too many people. The person receiving the information can feel overloaded if the distributed information is irrelevant or is secondary data. In the end, information overflow is increasing the total communication within an organization and does not increase their knowledge (ibid.).

Whittaker and Sidner (1996) state that email overload has increased as email today presents multiple purposes which adds activities such as personal archiving and task management. Giacoletto and Aberer (2003) describe email overload, where they discussed the users' behavior leading to this state. One primary reason is that users tend to file their emails in folder structures. This behavior is occurring because users tend to save emails for the future. Users still keep emails in their inbox even though they want to clean it. Users want to further investigate the importance of the content within emails before

taking action. Users organize their email directories and folders according to their daily income of messages (ibid.). According to Hogan and Fisher (2006), the users experience email overload due to the number of unresolved tasks within their inbox rather than the total amount of received emails. Whittaker and Sidner (1996) emphasize that the consequences of email overload are that documents get overlooked or go missing within the large set of emails when users try to manage their extensive set of inbox documents. However, email software helps users classify the emails according to sender and time but not according to their content (ibid.).

1.1.1 Transport operations

The transportation system is considered the critical element in the supply chain as it interconnects the different activities (Tseng et al., 2005). Transportation takes up to one-third of the cost of a supply chain. The transport activities are needed in the whole production process, which extends from the manufacturing process and the delivery to customers and returns. It is argued that coordination is essential for transport operations to make them beneficial (ibid.).

Transport operation is an essential part of the supply chain (Sanchez-Rodrigues et al., 2010a). Transport operations need to be flexible to handle uncertain events. Uncertainties in transport operations can be caused by either delay, issues regarding information, or demands. Uncertainties can also emerge if the supply chain integration experiences constraints or unmet demands (ibid.). Sanchez-Rodrigues et al. (2010b) state that information uncertainty occurs due to poor communication between shippers, carriers, and customers. A result of this can be sudden changes within transportation, such as extra or canceled loadings. The task for transport companies is to be efficient while still trying to manage unplanned changes and congestion (ibid.). Companies invest in Information and Communication Technology, ICT, to make their communication more reliable or increase inventory buffers to handle uncertainties (Sanchez-Rodrigues et al., 2010a).

1.2 Case company

The case company investigated in the study was *Volvo Group*. *Volvo Groups'* organization chart and the departments investigated are shown in figure 1. *Volvo Group* delivers transport and infrastructure solutions in the form of buses, trucks, construction equipment, and industrial and marine engines (Volvo Group, 2021a). They also offer several types of services such as financing, spare parts, rentals, etc. (ibid.). *Volvo Group* has several Business Areas, and three Truck Divisions, one of the Truck Divisions is Group Trucks Operation, GTO (Volvo Group, 2021b). GTO is responsible for truck manufacturing, powertrain production, remanufacturing, part distribution, and logistics services. GTO consists of six functions. One of these functions is Productions Logistics, PL (ibid.). PL takes care of transportations of material to all plants and distribution centers as well as delivering finished products (Volvo Group, 2021c). They also manage the packaging pool, including developing packages, logistics purchasing services, and the development of end-to-end supply chains. Transport Operations Europe, TOE, is an operational functional that goes under the PL function (ibid.). TOE is responsible for transporting material from supplier to plant, delivering finished products to the final market, and distributing and managing all packaging material. TOE's functions are Transport Material, Manage Packaging, Transport Products, Transport Design & Optimization, Business Control, and VPS (Volvo Group, 2021d). TOE has around 270 employees spread out in Gothenburg, Ghent, Kaluga, Lyon, and Eskilstuna (ibid.). TOE has many internal and external stakeholders such as Volvo Production sites and a large set of external logistics service providers. In 2020, TOE delivered around 82,000 vehicles (Volvo Group, 2021d).

This study is limited to investigating five departments within TOE functions; Transport Products Overseas Gothenburg, Transport Products Overseas Eskilstuna, Transport Material Trading Overseas Ghent, Transport Material Trading Overseas Gothenburg, and Manage Packaging Overseas. These are marked with a red box in figure 1. The limitations of these five departments were chosen in accordance with TOE and these represented all different ways that the operational departments within TOE communicated and therefore suitable for the study's purpose.

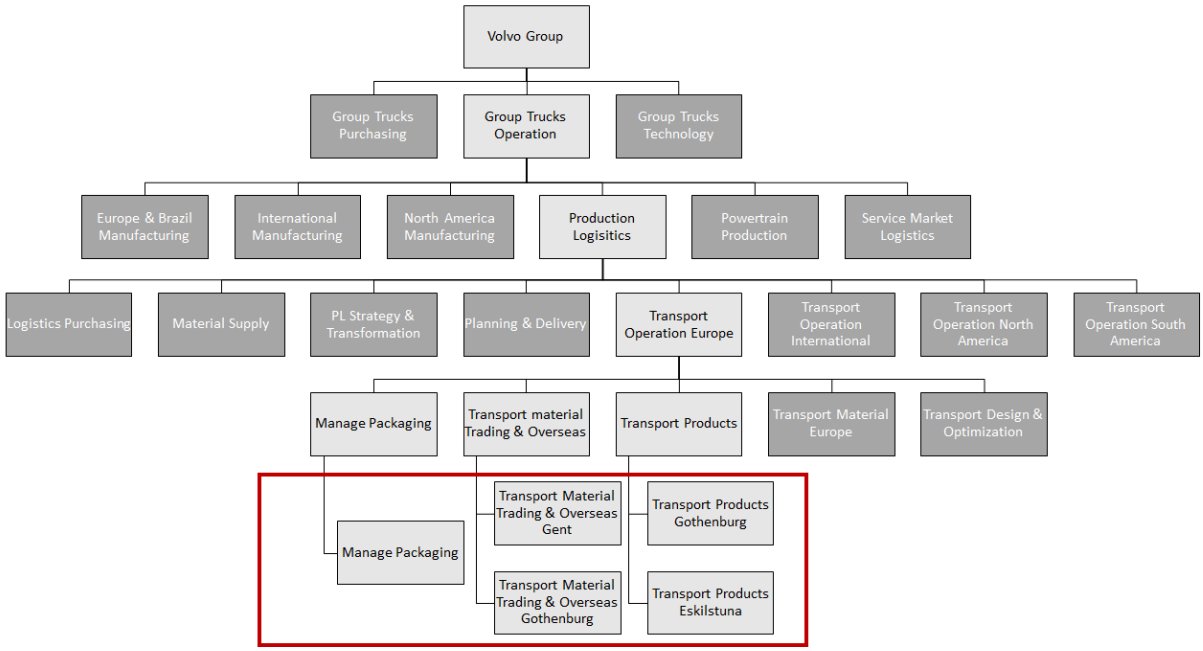

Figure 1: Volvo Groups Organization chart and investigated departments

Transport Product Overseas Gothenburg and Transport Product Overseas Eskilstuna are responsible for plan transport and secure short-term capacity as well as book, monitor and follow up transport for all *Volvo Group's* products that go overseas from the factories to America, Asian Pacific, and Africa. Transport Material Trading Overseas Gothenburg and Transport Material Trading Overseas Ghent are responsible for book, monitor, and follow up transports for all material that go overseas to the factories to America, Asian Pacific, and Africa. Transport Manage Packing is responsible for supplying empty packaging material to all suppliers within Europe, Middle East, and Africa and handling both strategic and operational tasks. The strategic tasks include forecast, volume planning, types of packaging for their global pool. The operational tasks are to make orders, plan transports, and keep track of all available packaging material in the loop. The five departments communicate with parties worldwide, both internally and externally.

1.2.1 Problem formulation

Communication within TOE associated with performing operational tasks is currently done by sending emails through an electronic mail tool. The communication consists of actors distributing and receiving worldwide emails, both internally and externally. TOE deems that managing the email is a time-consuming task where emails are stacking, and they have little control over their communication. TOE wants to decrease the workload for the people managing these mailboxes and increase the control over their communication. TOE thinks that the quality of emails could be a contributory factor to their problems due to the large set of emails that are handled every day.

The departments within TOE communicate by different numbers and types of mailboxes, personal and shared mailboxes. The usage of mailboxes differs between the departments and possibly contributes to better or worse solutions than other communication tools and channels. Therefore, this report investigates the effects of using email and if there are any communication tools and channels that would potentially be more beneficial to communicate through.

1.3 Purpose and research questions

Based on the background and problem mentioned above, the need for face-to-face communication has decreased, and more advanced methods to communicate have been introduced. The advancements in communication have made it possible to distribute information worldwide at a low cost. However, a consequence is that the high availability of information has increased and therefore increased the risk of information overflow (Kilpeläinen & Tyrväinen, 2004). The same principle can occur when communicating through email. Whittaker and Sidner (1996) state that the possibility of facing email overload has increased due to emails' many purposes. Therefore, this study investigates how TOE, that experiences email overload, manages their mailboxes. Further, potential improvements for TOE are developed with the aim to decrease workload and increase control over the communication performed.

> *The purpose of the study is to analyse the usage of electronic mail and identify potential improvements by using other communication tools and channels.*

Therefore, three research questions, RQ, have been developed and will be answered to fulfill this study's purpose.

As mentioned, many potential issues can arise when communicating through email. Therefore, the first RQ of the study is:

> RQ1: What are the effects of using email as a communication tool and channel?

Several factors were needed to be taken into consideration to be able to answer the first RQ. Firstly, what the effects are of using a shared mailbox compared to personal mailbox but also how the mailboxes are utilized. Secondly, if there are any additional activities associated with communicating through email. Lastly, if there are any potential quality aspects that affect the email communication.

RQ1 only analyses the effects of using email. Further, investigating additional communication tools and channels beyond email is necessary to find potential improvements. Therefore, RQ2 of the study is:

> RQ2: What are the different communication tools and channels applicable for businesses?

Communication types and business communication need to be investigated to answer the second RQ. Further, existing communications tools and channels within the industry need to be examined.

RQ1 and RQ2 are not dependent on each other, but the answers to these questions are the foundation to RQ3, which will result in recommendations of what to investigate further to improve the communication. Therefore, RQ3 of the study is:

> RQ3: What are the communications alternatives to overcome the potential implications of using email?

To answer the third RQ, the potential implications of using email need to be addressed and be further evaluated and analysed against the additional communication tools and channels investigated in RQ2.

1.4 Limitations

This study investigates how TOE manages their mailboxes. The investigation includes both the communication to external and internal parties as well as the respective actions performed on the received information. However, the study does not collect information from the customers, markets, suppliers, and carriers. The suggested improvements neither consider the economic perspective, technical details, requirements needed, or the implementation process or practical aspects.

2. Methodology

The chapter describes the methodology of the study by explaining the research approach, research design, methods, and analysis used to fulfill the purpose of the study. Further on, the ethical aspects and the trustworthiness is discussed.

2.1 Research approach

The two most frequently used research strategies are quantitative and qualitative (Bryman & Bell, 2011). An abridged explanation of qualitative research is collecting and analysing non-numerical data to gain a deep understanding of a phenomenon (Skärvad & Lundahl, 2016). However, data of quantitative nature is often collected and analysed as a complement to the qualitative data to enhance the understanding of the phenomenon (ibid.). This study investigated how TOE communicated through email and presented potential alternatives for communicating in an improved way. The authors needed to gain a deep understanding of the area. Due to this, a qualitative research strategy was suitable for this study. Marshall and Rossman (1995) argue that a qualitative study's RQs should be broad enough to explore the studied phenomenon but narrow enough to limit the study. All RQs in this study are characterized by qualitative strategy. However, RQ1 required some quantitative data from TOE's mailboxes to find and enhance understanding of the possible implications. A qualitative study usually has an inductive approach, which implies that the research aims to develop new theories based on the collected data (Bryman & Bell, 2011). This follows the study, as the purpose has no foundation on an existing theory. The study aims to gather and investigate data on a deep level around the usage of email and alternative communication tools and channels to draw conclusions and enable a theory to emerge in the form of improvements.

Lekvall and Whalbin (2001) present four directions towards research; explorative, descriptive, explanative, and predictive. The study's' purpose specifies the direction. An explorative research direction is when the study aims to understand and examine the existing problem and knowledge available around the subject. A descriptive research direction is when the study aims to describe or define a specific subject where information already exists. An explanatory research direction is when the study aims to answer the question 'why?' by studying the cause-and-effect relationship between several variables. A predictive research direction is when the study aims to foresee an existing phenomenon's outcome, and it often concerns ideas that have not been tried before (ibid.). This study aimed to understand and describe the usage of mailboxes and identify potential improvements. Therefore, it has both descriptive direction and explanatory direction. RQ1 and RQ2 are about understanding the effects of using email and other alternative communications tools and channels and therefore have a descriptive direction. RQ3 investigates how different communication tools and channels may overcome the potential implications of using mailboxes and by that has an explanatory research direction.

2.2 Research design

The design of the study has both a comparative study design and a multiple-case study design. The multiple-case study design extends a case study design and occurs when two or more cases are examined to focus on their contexts (Bryman & Bell, 2011). The main advantages of using multiple case design are that it enhances the possibility to build theory. It allows the researchers to obtain and analyse information from two or more cases and attains uniqueness and likeness across the cases (ibid.). This study used a multiple-case design to understand the effects of using email in different contexts and

departments, which is connected to the RQ1. According to Bryman and Bell (2011), multiple-case designs are often used to compare the selected cases, and under these conditions, the multiple-case study is lying under comparative design. A comparative design study compares, and contrasts findings obtained from several cases by using the same methods for all cases (ibid.). Therefore, this study performed the same methods to compare all cases in accordance with the comparative design. The purpose of a comparative design study is usually to find and understand the underlying factors behind the similarities and differences (Bryman & Bell, 2011). The study investigated several departments to understand the effects of using the two types of mailboxes.

2.3 Research methods

Research methods refer to the methods used to collect data. The data collected were primarily of qualitative nature and were conducted through interviews, benchmarking, focus groups, and literature review. Quantitative data was obtained from TOE's mailboxes.

2.3.1 Interviews

Interviews can be performed both in a quantitative and qualitative study (Bryman & Bell, 2011). In quantitative research, the focus is more on enhancing reliability and validity measurement and focusing solely on answering a pre-set of questions by conducting structured interviews. In qualitative studies, the execution is focused on a more general baseline to investigate the interviewees' perspectives on the topic. The most used method to gather qualitative data is by performing interviews due to its flexibility. The two types of interview techniques that lie under qualitative study are unstructured and semi-structured interviews. Unstructured interviews are usually basing the conversation on one central question. After that, the interviewee speaks freely around the subject, with the interviewer jumping in with small notions. Semi-structured interviews are based around a list of questions of interest, where there are occasions that the listed questions are not fully executed and can change order. Follow-up questions are usually in the execution of semi-structured interviews but are chosen to fit the subject. The primary task is to grasp the interviewees' point of view on the subject. Therefore, it is interesting to reinforce questions when the conversation is heading towards an area the interviewee feels is vital to discuss. The focus within qualitative interviewing is to grasp rich answers to the questions asked (ibid.). With semi-structured interviews, the study could gather more in-depth information regarding how individuals use email to communicate. The chosen interview technique is essential as it enabled the authors of this study to intervene or participate and by that focus on the subject. The data from the interviews were used to answer all RQ in the study.

Interview process

Two interview rounds were performed. The first round was performed to gain an understanding of each department's purpose and how they communicated. The second round was performed to get more in-depth information on how they communicated and get their views, opinions, and thoughts around business communication. The interviews were performed virtually through Microsoft Teams and were recorded and transcribed from spoken words into written words not to miss any information.

The first round consisted of 4 interviews with department managers, DM, see table 1. The interviewees were chosen due to their expertise regarding the departments. As mentioned above, the study used semi-structured interviews, and therefore the questions were to some extent predefined. Every interview was scheduled to take one hour. The questions are found in Appendix A.

The second round consisted of eighteen interviews with operational workers, OW, from the investigated departments, see table 2. The selection of interviewees was made by convenience sampling with preset requirements from the authors; that one person for each responsibility area should be interviewed. A convenience sampling is when the participants is chosen due to their accessibility (Bryman & Bell, 2011). The interviews were semi-structured, and the predefined questions were based on the findings from the first round of interviews and with the aim to answer RQ1 and RQ3. The predefined questions were developed to be understandable, decrease misinterpretations but open enough to provide rich answers. The questions are found in Appendix B.

Table 1: Interview list of department managers

Department manager	**Department**
DM1	Transport Products Gothenburg
	Transport Products Eskilstuna
DM2	Material Trading Overseas Ghent
DM3	Material Trading Overseas Gothenburg
DM4	Manage Packaging

Table 2: Interview list of operational workers

Department	**Operational Workers**	**Responsibility Area**
Transport Products Gothenburg	OW1	Regular and short shipped transports
	OW2	Regular flows
Transport Products Eskilstuna	OW3	Special transports
	OW4	Regular transports
Material Trading Overseas Ghent	OW5	Kaluga and Blocked Invoices
	OW6	Retention
	OW7	Direct flows
	OW8	Xdock administration
	OW9	Customer Service Overseas
Material Trading Overseas Gothenburg	OW10	Samba flow
	OW11	Salsa flow
	OW12	Kalinka flow
	OW13	Asia, VBC and General Cargo

	OW14	US
	OW15	Air Export
Manage Packaging	OW16	Special planner
	OW17	Distribution planner
	OW18	Regional planner

2.3.2 Benchmarking

Benchmarking is a management tool used to investigate the market and competitors to seek improvement and innovation (Anand & Kodali, 2008). The method uses learnings from best industry practices and implements those to reach or even exceed the companies' performance goals. Moreover, identify the best practices, understand their meaning and process, and adapt these practices to the organization to enhance its performance (ibid.). The fundamental with benchmarking is to understand areas where one is lacking but other companies strive and implement these best practices within their process (Bhutta & Huq, 1999). Benchmarking is often perceived as a copying or imitation tool, but it rather enhances an organization's innovation process (Dattakumar & Jagadeesh, 2003). Traditional benchmarking has emphasized the output of a process while it today passes over towards a focus on the process's input (Anand & Kodali, 2008). By that, benchmarking methodology is moving towards more upstream elements rather than downstream (ibid.). The study focuses on searching for best practices regarding tools and channels for businesses to communicate through. The findings from benchmarking were used to answer RQ2 and RQ3. Therefore, benchmarking was performed before the focus groups to use the benchmarking material in the focus group. This is explained in more detail under section 2.3.3 Focus groups.

Benchmarking process

The selection of the benchmarking company was made in consensus with TOE. However, the final decision was made by the authors. The chosen benchmarking company is at the forefront of the usage of digital, automated, and intelligent transportation solutions and therefore relevant to benchmark. The benchmarking company was anonymous due to sensitive data. All contact with the benchmarking company was performed by email or virtual meetings and interviews. Neither the virtual meetings nor interviews were recorded.

The benchmarking was divided into three phases. The first phase consisted of briefly understanding the company and how they performed their communication to decide if the company fit the study's purpose. This was done by a virtual meeting where the authors had outlined some subjects to cover, but no specific questions were predefined. The content grasped from this meeting was analysed and deemed as suitable for the purpose of the study. In the second phase, interview questions were predefined based on the information grasped from the first phase. The interview questions were sent out beforehand by email; these are found in Appendix C. Virtual participant observation was performed to gain more in-depth knowledge of the benchmarking company's communication system. The third phase was to review the written answers from the benchmarking company and prepare and perform a virtual interview where some of the answers were further elaborated.

2.3.3 Focus groups

Focus groups are an interviewing technique involving at least four persons where the emphasis is set on a specific theme and discussed more deeply than group interviews (Bryman & Bell, 2011). Performing focus groups is more applicable than group interviews, as this study has a qualitative approach. Focus groups enable the interviewer to understand how individuals answer as a group rather than themselves (Bryman & Bell, 2011). Focus groups enabled the facilitators to understand their way of answering questions as a unit. Focus groups enabled the researcher to understand how the participants react to one another's thoughts and understand how others perceive and interact according to the participants' answers, therefore getting a view of the group as a whole (Bryman & Bell, 2011). The qualitative approach prefers the focus groups to be reasonably unstructured to see how everyone views their given questions.

The moderator or facilitator guides the focus group but will not be too involved in the discussion (Bryman & Bell, 2011). Focus groups can be used early in the research to let participants discuss general questions and formulate problems and even possible solutions. Performing interviews with one participant is suitable when there is an interest in understanding why the participants have a specific view, while focus groups enable them to discuss their views. The difference is that the practitioner of focus groups may hold a specific view on a subject and miss certain considerations regarding topics brought up during the session. Focus groups enable practitioners to adapt further and form their views, therefore enhancing their views to a higher quality degree (ibid.). During the focus groups, the practitioners did not get intervened by the facilitators more than necessary to make sure that the facilitators did not influence the group dynamic views and solutions. The focus group allows the participants to bring out their thoughts of core issues concerning a specific problem or area, which is also possible to grasp from one-to-one interviews, but in focus groups, the participants have more control and can easier steer the discussion to enable their view to reach the surface (Bryman & Bell, 2011). This contribution is of importance when undergoing qualitative research to grasp people's viewpoints (ibid.). From the focus groups, the study could grasp the effects of using email and an additional communication tool. The focus groups were set to compensate for the interview's individual perspective by adding the group's perspective. The findings from the focus groups were related to answering the first and third RQ.

Focus group process

The selection of participants was done in collaboration with TOE. The authors' requirements were to have at least one from each department to cover the different ways the departments communicate and select participants from the list of interviewed employees. Another requirement was to strive for an equal number of participants who used personal mailbox and shared mailbox. The selection process was done in two steps. Step 1 was to make a proposal of people that would be beneficial to participate in the focus groups for TOE. Already performed interviews were reviewed and evaluated on their knowledge, opinions, thought, way of communicating and ability to share these. Step 2 was to discuss the proposal of participants with TOE and further see the possibilities to gather all of them at the same time. Twelve people were in the end chosen to participate as they then could be divided in two groups, where each group consisted of 6 people and one moderator (author) and by that achieve good discussion where everyone had their chance to state their opinions, thoughts, and views. It was not suitable to have more than twelve people because it would be too big of a difference between the users of personal and mixed mailbox in comparison with the shared mailbox users. The participants included in the focus groups are listed in table 3.

Table 3: Participant list, focus groups

Department	Participants	Responsibility	Communication tool
Transport Products Gothenburg	P1	Regular and short shipped transports	Personal mailbox
	P2	Regular flows	
Transport Products Eskilstuna	P3	Special transports	Mixed mailbox
	P4	Regular transports	
Material Trading Overseas Ghent	P5	Direct flows	Shared mailbox
	P6	Xdock administration	
	P7	Customer Service Overseas	
Material Trading Overseas Gothenburg	P8	Samba flow	Shared mailbox
	P9	Asia, VBC and General Cargo	
	P10	US	
Manage Packaging	P11	Special planner	Shared mailbox
	P12	Distribution planner	

The focus groups were virtually performed during three sessions. The sessions were 1 hour long and none of them were recorded. Each session was focused on a specific theme. First session focused on the benefits, drawbacks, and quality issues with their current way of communicating. Second session focused on the suitable context for using a shared mailbox and personal mailbox. In the third session an already handed out scenario, usage of a ticket system, was discussed. The questions for each session are found in Appendix D.

An introduction of each session was sent out two days ahead by email. The email included the reason for the focus groups, theme to cover, needed preparation and the structure. The results from each workshop were sent out by email directly after each session ended. Notes were taken during all sessions.

2.3.5 Mailbox statistics

The study used statistics from shared mailboxes to support the qualitative data collected. People participating in interviews and focus groups may have subjective opinions, and therefore quantitative data was used to minimize bias.

Mailbox statistics process

In collaboration with *Volvo Group,* several mailboxes were chosen to be analysed to make sure that the mailboxes presented how each department is working. Only shared mailboxes could be analysed due to several laws and rules that restrict the investigation of people's personal mailbox. Interview transcripts from DM and OW were reviewed to find what information that was of potential interest to analyse further. The list below shows information drawn from Power BI:

- Numbers of total emails, received emails, and sent emails
- Senders domain
- Attachments
- Number of letters included in the emails
- Number of emails included in the email threads
- Carbon Copy

2.3.4 Literature review

The reason for doing a literature review is to extract existing information around the research topic (Walliman, 2010). Therefore, literature was reviewed to give insight and background around the topic of the study and further build the theoretical framework. The framework was later used to discuss the data collected and to answer the RQs. The reviewed areas for the theoretical framework are information, communication, business communication, communication tools and channels. Information was reviewed to understand the difference between data and information and to find quality criteria regarding information and communication. Information exchange and communication, business communication was reviewed to understand the communication process and how it affects companies. Various communications tools and channels were reviewed with the purpose to understand how companies can communicate and the effects of using these.

Google Scholar and *Chalmers University Online Library databases* were used as search engines to find and review the relevant literature. Examples of keywords that were used are; communication, information, communication methods, communication quality, business communication, internal communication, external communication, communication tools, communication channels, verbal communication, nonverbal communication, information overflow, decision making, email overload, ticket system. The literature selection started by scanning the abstract and conclusion to see if the literature was of relevance for the study. The following step was to evaluate the quality and academic relevance of the literature to achieve a high quality of the theoretical framework and to accomplish a good foundation of the theoretical framework. To find alternative ways of communicating, literature from companies was evaluated as there was a lack of academic literature on new communication methods.

2.4 Analyse process

The different methods used within the study generated an extensive amount of data. Further, the data gathered from some of the methods covered several RQs. Therefore, the analysis of this study was performed in two phases to answer the RQs. The first phase was a pre-analysis on data collected from the interviews, focus groups, and mailbox statistics, presented in Chapter 4 Pre-Analysis. The reason for this was that the data collected from these research methods covered several RQs. The second phase was to analyse data collected from the benchmarking, data from the pre-analysis (first phase) and data from the theoretical framework to answer the RQs.

2.4.1 Pre-analysis

Interviews

Firstly, to analyse the large amount of data collected, all interviews were reviewed to find and create relevant keywords. The keywords were then written on post-it notes, including the participant's initials and department number. The following steps when all post-it notes were created was to map them out on a wall. The grouping on the wall was first based on what key area they were concerning, see figure 2 for an example of how it looked like. After that, they were regrouped by different themes, see figure 3, for an example of how it looked like. This analyse method enabled the authors to count and compare the answers to gain an understanding of how the different departments and respondents thought and operated but also enabled the authors to find similarities, differences, and synergies.

Figure 2: An example of how the grouping of post-it notes based on key areas looked like (own photo)

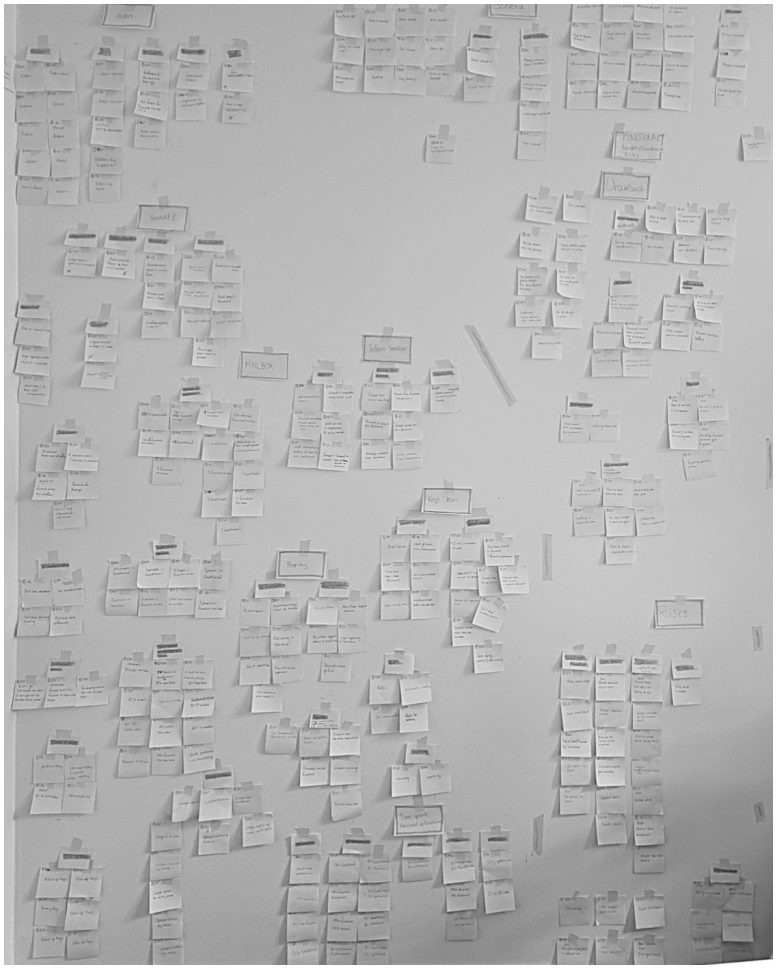

Figure 3: An example of how the grouping of post-it notes based on themes looked like (own photo)

Focus groups

Two parts of the focus groups were analysed, what the participants stated and communicated to reach their final answers to the asked questions as well as each group's final answers. The notes from the focus group sessions and the results were reviewed to find and create keywords. The keywords were then analysed to find statements and opinions regarding different communications tools and channels.

Mailbox statistics

Power BI was used to analyse the data from the mailboxes and visualize the information. The information drawn from Power BI was further analysed to find similarities and differences between the mailboxes and how different factors affected the information.

2.4.2 Main analysis

The findings from the pre-analysis gave understanding of how email is utilized and the effects of using this communication tool. Further, the pre-analysis of focus group session 3 contributed to give input about the suitableness of an additional communication tool. The analysis of the virtual observation at the benchmarking company contributed to understanding how an additional communication tool than email was utilized. The analysis of the benchmarking companies' interview answers assessed the effects

of using this communication tool. Overall, the analysis of benchmarking contributed with knowledge around an additional communication tool used in the industry. Literature then added implications of information, communication, business communication, and existing communication tools and channels.

2.5 Ethical considerations

It is relevant to consider ethical issues that can arise at all stages of a business research process (Bryman & Bell, 2011). The main objective of considering ethical issues is to handle participants and data in the best way possible. There are four main ethical principles; Harm to participants, Lack of informed consent, Invasion, and Deception. The main objective of considering ethical issues is to handle participants and data in the best way possible, and it is the researchers' responsibility to minimize harm to participants or get adversely affected by the research (ibid.).

Harm to participants can take form in many ways, harming participant's progression and self-esteem, physical harm, emotional harm, harm to future career opportunities, and stress (Bryman & Bell, 2011). Anonymity and confidentiality of information minimize the risk of harming the participants. Pseudonyms can be used to erase the possibility of being recognized (ibid.). *Volvo Group's* company and the functions and departments investigated in the study will not be anonymous, which has been approved. The benchmarking company and all the participants in the study are anonymous. Pseudonyms have been used in the cases where it was needed. The authors have treated all participants with respect and informed them that they do not need to answer or participate in discussions. Terms and conditions have been signed both by *Volvo Group* and the authors, where it stated that sensitive and confidential information always needs approval from *Volvo Group* or deleted from the study. Further on, the data collected cannot be used for other purposes than both parties agreed on.

The principle of Lack of informed consent means that the participants should be provided with all necessary information about the research process to make a well-grounded decision whether to participate or not (Bryman & Bell, 2011). The participants should also be informed and approve the usage of audio and video recording (ibid.). Participants in the study have been provided with information about the study and its process at several occasions both from the authors and the management team at TOE. Consent has been approved before all interviews and focus groups to prevent Lack of consent.

Invasion of privacy is an ethical principle that means that the participants have the right to privacy. The researchers cannot invade or disrespect the participants' values (Bryman & Bell, 2011). It can be challenging to detect whether a topic is sensitive or not as it varies among individuals. Therefore, every participant and case need to be treated individually (ibid.). Participants in the study were not obligated to answer the questions or participate in the discussion during the focus groups. All participants could end the interview and participation in focus groups at any time. Questions and discussion topics were carefully shaped to avoid sensitive topics that may intrude on the participant's privacy. According to Bryman and Bell (2011), the undertaken actions reduce the risk to overstep participant's privacy.

Deception means that the purpose of the research or the reason for method collection is insincerely presented (Bryman & Bell, 2011). It can also occur when the moderator of data collection pretends to be someone who it is not. Deception usually occurs when the researchers aim to get natural behavior and answers from the participants during an experimental treatment or observation (ibid.). Participants in the study have been provided with truthful information regarding the purpose and process of the research.

2.6 Quality criteria

The evaluation of business research is mainly done through the criteria of reliability, replication, and validity in quantitative research (Bryman & Bell, 2011). Their adoption within qualitative research has been discussed and adjusted, resulting in two primary criteria; trustworthiness and authenticity. Trustworthiness is divided into four other criteria; credibility, transferability, dependability, and confirmability. Authenticity is concerning a broader scope, including political impact on the performed research (ibid.). This research did not focus on the broader political implication, and therefore authenticity is not further elaborated.

Firstly, the credibility of the findings is concerned whether the researcher enables the participants to access the findings or not and how well the researcher has fully understood their social world (Bryman & Bell, 2011). Second, the credibility of the findings is determined by how well the research has followed the guiding principle of good execution (ibid.). After the interviews, benchmarking, and focus group execution, the participants confirmed the summary's correctness by having access to it. Further, each method's execution was evaluated on how well it follows the literature's guidelines.

Transferability typically concerns small groups with members sharing similar characteristics through an intensive study focusing on grasping deep understanding rather than a broad understanding (Bryman & Bell, 2011). Broad understanding is more correlated with quantitative nature. Qualitative data orientation is more correlated with its uniqueness to the examined social world than quantitative data. A qualitative study focuses on creating a detailed description of the culture within the studied social world. The detailed description is supposed to be used as a foundation for making judgments about adapting the findings within other social realities (ibid.). The studied social world of email communication in business has been described and elaborated in general terms to enable others to apply a similar study into other social realities.

Dependability suggests that the researchers act as examiners of the process (Bryman & Bell, 2011). The process is overlooked throughout execution, and examiners ensured that all documents were kept and accessible during the research. After that, the research observators will examine how well the procedure continues according to the set plan (ibid.). A supervisor from *Chalmers University of Technology* has continuously overlooked the process and documents to confirm that the procedure is continued as agreed and in the right manner.

Confirmability considers that business research can never be completely objective, but researchers can still act without allowing individual values to affect the findings and the research itself (Bryman & Bell, 2011). The project never let personal values affect the study's direction, instead it focused on the theory and the study's circumstances.

3. Theoretical Framework

This chapter presents the theoretical framework. The theoretical framework represents the bases of information, communication, and business communication. Further, it presents traditional and new communication tools and channels and the effects of using them.

3.1 Information

According to Buckland (1991), information is considered in three different ways. Firstly, where information is looked upon as information-as-process, the received information will impact the person's knowledge. In this case, the process is the act of informing or communicating knowledge to someone. Secondly, information-as-knowledge is similar to information-as-process. The distinction is that it also focuses on decreasing uncertainty of the given information and denoting the content of what is conveyed. Lastly, information-as-thing describes the information concerning informative objects, such as documents and data. Knowledge is intangible, and the senders try to transmit intangible things such as opinions, beliefs, and knowledge into physical form, e.g., text or communication. The somewhat physical form of the encoded knowledge is corresponding to information-as-thing (ibid.).

Knowledge and information are not equivalent (Boisot & Canals, 2004). Boisot and Canals emphasize that if a person receives a message, the receiver needs to have the contextual background knowledge to understand this message and fully comprehend its meaning. If two persons receive the same message, they can withdraw different outcomes, depending on their contextual background knowledge. The first person only withdraws the direct meaning of the words, while the other with more contextual background knowledge understands that the senders have more meaning behind those words. This shows that people understanding the words in a message do not necessarily understand the whole meaning behind it. Therefore, knowledge and information cannot be fully equivalent to one another (ibid.).

Problems regarding information are often located in incorrect information, and these could be due to errors in systems, new requirements that have not been considered for inclusion of unnecessary information (Gorla et al., 2010). Information quality in regard to timeliness means that the information is not delivered on time and therefore does not fulfill the needs of the end-users, which can create dissatisfaction. The information needs to come from the correct time frame with clear correlation and inclusion to the spoken topic (ibid.).

3.2 Communication

Communication can be identified as a social process consisting of more than one person (Liu et al., 2010). According to Lunenburg (2010), communication is the process of carrying over information or understanding. Communication is only achieved if both parties find a common understanding from the exchange of information. The problem with communication is that users cannot foresee all the future incoming activities since communication is continuously changing in activities (Giacoletto & Aberer, 2003). Two elements are driving the communication, the sender and the receiver, see figure 4. The sender is the person striving to communicate information to the other element, while the receiver engages with understanding the information. Before engaging, the sender alters its information by deciding what words, gestures, and symbols to use to complete the message, and this phenomenon is called encoding. After encoding, the sender forwards the message to the receiver through a chosen channel. The channel acts as a carrier for the message and could be a telephone, email, written paper,

or face-to-face contact. When the message reaches the receiver, he or she decodes the message into information (ibid.).

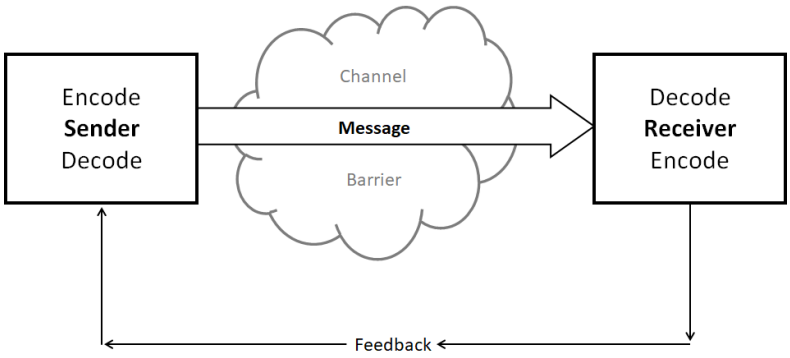

Figure 4: Communication process (Adapted from Lunenburg, 2010)

Quality characteristics for the sender to have for efficient communication are having the proper knowledge, having the right attitude, right capabilities, and skills (Liu et al., 2010). When performing communication involving more than two people, variables such as understanding and responding to the delivered message arises with more complexity than one-to-one contact. Good quality in communication depends on the message's level of clarity, how the receiver reacts and responds to the delivered message, and how comfortable the participants are when communicating. The person delivering the message should know the meaning behind it and consider how the receiver will react. It is possible that one party experiences good quality when communicating but not the other one. It is essential to consider both parties' experiences and how they influence each other to reach the desired communication (ibid.). The communication can be unsuccessful if the sender does not encode the message in a good way, the receiver unsuccessfully decoding the message, or the channel within which the message is delivered is not suited to deliver the sender's message (Traxler & Gernsbacher, 1992).

Failure in communication between two parties can be linked to barriers (Shrivastava, 2012). Barriers are obstructions when transmitting information from one individual to another. Barriers can occur during the whole transmission process of a message, from the start of encoding the message and up until the message is being received and decoded. These barriers cannot always be foreseen and can emerge unwillingly because of differences between the sender and the receiver. These barriers will magnify if there are large differences between the people communicating. As seen in figure 5, there are nine types of barriers; Physical, Perceptual, Emotional, Cultural, Technological, Language, Gender, Interpersonal, and Noise (ibid.).

Physical barriers affect the spread of information and are associated with infrastructural interiors or zones within an organisation (Shrivastava, 2012). Physical barriers are used to decrease information spread to the wrong audience. Perceptual barriers are influenced by how each individual looks at things differently and can affect the intended meaning of an encoded message, as the receiver may alter its meaning. Further, the sender and receiver can have different emotions during the communication, and the emotional barriers consist of emotional elements such as mistrust and fear. Cultural barriers are associated with how different peoples' cultural backgrounds can affect how they communicate, as meanings of words can differ between cultures. Communication has, due to technological advancement, become more accessible and of higher speed. However, technological barriers are associated with unpredictable errors from the technology that can affect the delivery of information to the receiving end. Language is used to describe thoughts and opinions, and the sender and receiver must be using the same language. However, language can always be a potential barrier. Gender barriers mean that the

genders use different words to describe the same things due to their different ways of thinking. Interpersonal barriers are located in the differences between the sender and receiver. To prevent interpersonal barriers impact, the sender and receiver uses are on the same note in terms of understanding and language. Noise barriers are external interruptions in communication. Noise barriers can be everything from communicating in a too-loud environment, the psychology people have, if people have decreased hearing, managers deliver poor messages to subordinates and create confusion and forward. Managing those barriers is currently researched, and new technology attempts to minimize these barriers and decrease their interference in communication (ibid.).

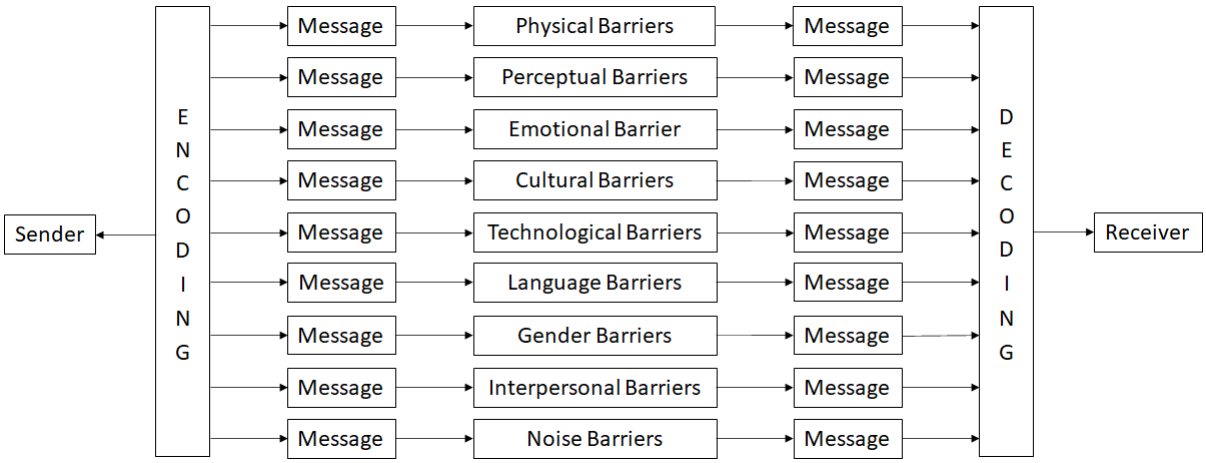

Figure 5: Communication barriers (Adapted from Shrivastava, 2012)

3.2.1 Communication types

According to Rai and Rai (2008), there are many different ways of communicating and these are as follows; verbal, nonverbal, written, spoken, intrapersonal, interpersonal, internal, external, vertical, and horizontal communication.

When performing verbal communication, it is crucial to make the message clear and understandable for the receiver (Rayudu, 2009). There are no particular rules when performing verbal communication, but there are principles to follow to give effective verbal communication. Longer sentences can generate misunderstandings, while shorter sentences allow the listener to keep track of what the speaker strives to communicate. It is essential to be clear when performing verbal communication to enable all listeners to understand. To reach clarity, the speaker must evaluate the message and rethink the ideas so that they are clear before talking. Using the correct word at the correct time is vital to deliver verbal communication with precision. It is important that the speaker has complete knowledge of the used words, their synonyms, and antonyms. Words can have various meanings depending on what the context is. Speakers should also avoid using cliche phrases that are too often used because those can instead create irritation for the listener (ibid.). What type of words a person chooses to deliver a message can impact the understanding and feelings towards the receiver (Wiener & Mehrabian, 1968). The words can impact the receivers' attitude and feelings towards the speaker and the delivered message. The words used can be of no harm but can in indirect meaning be interpreted as it. The person receiving the message can interpret the message by looking into the movements, facial expressions, and hearing the tone of the voice (ibid.).

Nonverbal communication can be performed to deliver different types of messages (Key, 1980). Nonverbal communication can depend on the visual representation, where the human's eyes are, for example, good at reviewing/estimating the distance to objects (Ruesch & Kees, 1974). The human eye

is also good at perceiving several different objects by only looking once. The object is often used to attract customers to a shop by placing them in the shop's windows. The object's shape, surface, and material can deliver different emotions towards the receiver. People are influenced by objects' attributes such as signs, codes, lighting, and more. These attributes contribute to delivering a message (ibid.).

The written form of nonverbal communication is emphasized by Traxler and Gernsbacher (1992) to be more prone to deliver a failed message than a spoken message. Spoken communication is working more in a collaborative way where the sender and receiver interact together and collaborate to increase mutual understanding. The writers and the readers are often not at the same place, making them unable to collaborate to increase mutual understanding (ibid.).

According to Rayudu (2009), effective writing can be determined by several factors such as Clarity, Completeness, Conciseness, Brevity, Accuracy, and Readability. Clarity in efficient writing is based on decreased misunderstanding by logically planning the message to make it more smooth for the reader. Clarity is also concerned with staying away from exaggerated language and focuses more on delivering the purpose of the message. Completeness concerns creating a message without missing important information. An incomplete message can create misunderstanding, a consequence of this is that the reader is asking for more explanation of the delivered message. Conciseness in writing means using fewer words to express the purpose of the message. Being concise means using less exaggerated expressions and taking away unnecessary details. Brevity concerns not wasting too much time on including unnecessary information, which leads to waste for the reader to create the message and for the receiver to read it. Accuracy in written messages concerns that the message needs to be correct, as misuse of grammar, spelling, wrong figures, and wrong information can affect the understanding and decisions based on the message. Accuracy can be increased by checking the written message and making sure that everything is correct. The readability of the created message is based on its clarity and work to make the purpose clear for the reader. Using too many words decreases the readability of the message and if the reader does not understand its message it loses its meaning and can even lead to the receiver not reading the message at all (ibid.).

Most common is face-to-face contact, which extracts meaning in both vocal and visible behavior (Gros, 2007). The vocal and visible behavior are linked together in their way of communicating. The authors emphasize that both verbal and nonverbal communication should be looked upon as a unit instead of being separated as earlier studies have investigated them separately (ibid.). Nonverbal communication also occurs while listening to a speaker when having face-to-face contact (Key, 1980). The person speaking is dominant when delivering information and the listener is quiet. The listener can give confirmation of understanding the message by short verbal or nonverbal responses. The nonverbal response to ensure understanding of a message is most commonly a simple nod. Listeners can actively communicate by motions, the listener can change posture, rearrange the direction where to look at, or do other gestures (ibid.).

What is being thought of within a person's mind is called intrapersonal communication (Rai & Rai, 2008). A person is constantly having thoughts, and these are following the person's experience and associations of things. When a person is being active, the interpersonal communication is being engaged in a more logical and clear way, e.g., when a person is solving a problem. Interpersonal communication consists of more than one person and enables better working relationships, both in creating relationships and maintaining them. When two persons talk, both their intrapersonal communication is affecting their interpersonal communication. Not every person has the same attitude, views, and opinions, which are included in the intrapersonal communication. It is of importance to be aware that this affect how others receiving the sent message are decoding them and react accordingly. Before engaging in interpersonal

communication, the sender must consider the receiver's intrapersonal attributes to create better communication and understanding ground (ibid.).

3.3 Business communication

The communication performed within an organization is called internal communication, and the messages that go outside the organisation are called external communication (Rai & Rai, 2008). Internal communication can be all different types of messages that are processed throughout the organization, including written, verbal, and nonverbal communication. Internal communication can both go upwards and downwards between people with different statuses and go alongside employees with the same status, moving horizontally. The environment within an organization is affected by the style of communication and how well it is performed. Internal communication can affect the business if colleagues have a hard time collaborating (ibid.). Internal communication should be effective and utilise the information system (Jakubiec, 2019). Poor outcomes from the information system can be located in companies' inefficiency to communicate (ibid.). The communication moving in a vertical direction is based on the sender and receiver's hierarchy and status (Rai & Rai, 2008). Downward communication is when persons of higher authority or status deliver messages towards their subordinates, and upward communication is the opposite, see figure 6. It is essential to be aware of what formal channel should be used when delivering downward or upward communication, because it is seen as improper behavior to use unsuitable channels for each respective communication direction (ibid.).

External communication affects how others perceive the organization, and the organization should consider having policies regarding communication with the external parties public (Rai & Rai, 2008). To have an efficient and well-working business, the organisation should enable its workers to communicate on even grounds with its external partners (Jakubiec, 2019). This means that each colleague is on the same level when communicating with external parties in regards to their importance to the company (ibid.). When being on the receiving end of external communication the organization should effectively distribute given information to the right person after it has been documented correctly, but also store the given information for future usage (Rai & Rai, 2008).

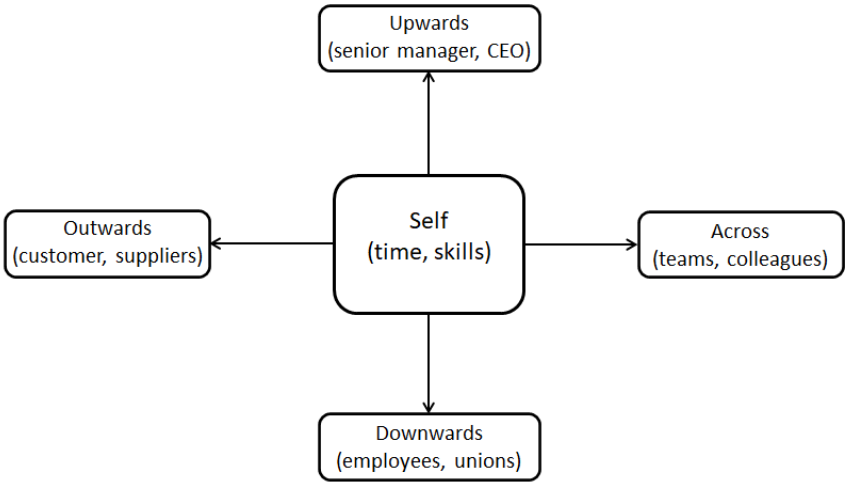

Figure 6: Directions of management communication (Adapted from Jakubiec, 2019)

3.3.1 Information overflow

Today's organisations store their information in digital form, which enables the information to be spread more efficiently (Kilpeläinen & Tyrväinen, 2004). There is a risk of being overloaded by all the

information when having high availability. This circumstance occurs when people distribute information to too many people and, in some cases, not to the right people. The undesired data is often unnecessary or is secondary data to the receiver. When employees feel overwhelmed with information, it can affect the organisation's communication by only increasing the total communication without adding more knowledge to the employees, instead adding more work (ibid.).

When information is overly distributed between functions and people to a degree that they cannot manage, then information can affect employees to feel stressed and consequently make people make more errors (Edmunds & Morris, 2000). Anxiety is another consequence of information overflow, where employees worry if they have missed certain information distributed to them. Further reasons why information overflow occurs is because people feel the need to send and collect information just in case they need it to be on the safe side. Companies should evaluate their information distribution to see what information is actually contributing with value-added information (ibid.).

Poor decisions in communication within an organization are often located in the lack of information (Mohr & Sohi, 1995). Poor decisions are not as frequently located towards having too much information, because people making the decisions usually think that higher amounts of information generate higher quality. When there is much communication going back and forth, there is a risk of information overflow. When communication between two parties starts to reach information overflow, there is an annoyance factor that can emerge. The annoyance factor establishes when one party does not desire the information given by the other party. Mohr and Sohi suggest that the communication relationship between two parties should enable feedback, where the sender and receiver can give feedback on the information clarity, verify the assumptions and further feedback to enable the delivered information to be credible, accurate and complete (ibid.).

Businesses in a high-velocity market require employees to make fast decisions (Eisenhardt, 1989). To make fast decisions, there should be few sources giving input of information and decrease the amount of needed analysis before a decision can be made. Fewer people within the decision-making process enables decisions to be made faster, as strong leaders can do (ibid.).

To improve communication, companies should not see their internal communication only as a process to transmit information but as a way of building up improvements, driving motivation, and educating employees (Jakubiec, 2019). The author suggests different actions to improve communication. Firstly, using more graphical tools such as pictures to describe the information, the information is easier to grasp by not only using the written word. Secondly, understand the audience the sender writes the message to as this will result in a decreased amount of sent messages as the message reaches only the right people. Lastly, informing colleagues before a crisis arises so that they can prepare for upcoming time-pressure, because the most sensitive time to communicate is when experiencing time-pressure (ibid.).

3.3.2 Traceability and visibility

Organisations strive to increase transparency by making their information more visible (Hoeven et al., 2019). The organisation has more visible information if people have access to it, and consequently the organisation gets more transparent if the visible data is used to make the organisation more open. If people have more information available but cannot access it, it can contribute to frustration. The other way around is when too much information is available and as a result makes it hard to interpret. It is essential to find the right level of transparency and the right amount of visible information to make the organisation work more efficiently (ibid.).

Availability of information refers to how the information is documented and stored. The information itself needs digital traces to make them available for others (Hoeven et al., 2019). The available data is then evaluated on how easily it is accessible for others. The characteristics showing the degree of accessibility are how well they are sorted and coded in relevance to the information. How well these two characteristics are performing shows when people are searching and retrieving the information (ibid.).

The most recognizable way of retrieving information is through searching and people categorise documents to make them easier to find (Watt, 2009). Information retrieval of documents depends on the categories the document has been placed in, as people search for similar texts and clusters to retrieve the information. The problem with categorisation is when labeling the information. When labeling and categorising documents, people tend to use words that are within the documents or from their social references. Therefore, it can be more challenging for others to understand the content of the documents or categorisation by only looking at the label. Categorisation and labeling are essential to trace the needed information efficiently, and there is a qualitative decision behind the labels and rankings of the documents (ibid.).

3.4 Communication tools and channels

Carr and Kaynak (2007) mention that the traditional ways of communicating are by using phone, email, written form, and face-to-face contact. The new digital era introduces more advanced methods to communicate, which correlates to the utilization of computers. There are different ways and methods to communicate and share information, but all have one thing in common, the utilization of technologies. One thing that is difficult to replace is the traditional face-to-face contact from business to customer, but the authors emphasize that new technologies enable users to share information with other alternatives than face-to-face contact. Electronic devices and tools enable the user to communicate information in a time-efficient way. Further, it enables the users to store information and let others have access to it. The frequency of communicating with partners increases when using electronic devices (ibid.).

Information and communication technology, ICT, uses telecommunication to give access to information (Ratheeswari, 2018). ICT involves tools such as phone, internet, and wireless networks (ibid.). ICT has, for example, contributed to decreasing manual handling work and increasing the efficiency of the library business (Bhoi, 2017). ICT enables organisations to improve their efficiency in management processes and find new ways to respond to users with higher capacity. Different applications can help organisations store information, create new information, and increase the exchange of knowledge (ibid.). ICT is also beneficial for business processes in decreasing costs and risks, keeping track and access to updated information, improving the organization's business model, managing their knowledge, and coordinating their work (Acosta-Prado & Tafur-Mendoza, 2021). Further, the already existing business process gets more efficient and enables new processes to emerge or be created (ibid.).

3.4.1 Email

Email as a communication tool is today a common channel to distribute information and communicate (Dürscheid et al., 2013). The structural elements of an email follow as header, body, and signature. Email is regarded as an old computer-mediated communication, CMC, mode that decreases in popularity as new modes arrive on the market. Even if email is an old CMC mode, it is still seen as the most important one, because it is a well-known and understood communication tool. Email as a

communication tool is used in many different areas, such as sharing information, sending invitations or other data. By sending emails instead of calling by phone, enables the sender to think through their words and take up their time as a phone call would. Email enables users to forward the same information to many people at once and store the information. The usage of email business has reached high grounds and takes up many working hours, therefore, businesses are reducing their allowance of putting time on emails (ibid.).

The email has added features such as Carbon Copy, CC, where the sender of an email sends a copy of the created message (Giacoletto & Aberer, 2005). The CC feature enables more people to be involved in the communication. There are other features to use in email, and these are Forward, FW, and Reference, RE, which enables the user to share certain messages with others (ibid.). Haesevoets et al. (2019) advocate that the feature CC enables an organization to enhance transparency and increase trust. CC gives more transparency in an organisation because it enables the sender to share the copied information. The drawback with CC is that employees may experience that the CC feature is used to monitor and control people. When people start to feel controlled, they feel that the other party may have a lack of trust in the people put in CC. Organisations may have different practices regarding the usage of the CC feature, where some must include their supervisors in cc and others not. The number of emails, including people in CC, may reflect how the organisation's practice is actually used (ibid.).

Email overload

Email is heavily used within business organisations and takes up a large proportion of their workdays (Pignata et al., 2015). Extensive tasks performed with emails can create stress for employees, disrupt their work tasks and too much monitoring work (ibid.). Due to emails having multiple purposes it has increased the possibility of feeling overloaded with emails (Whittaker & Sidner, 1996). A consequence of email overload is that it gets harder to manage the information and files, but it is also a risk that emails get overlooked or get lost in the process. People experience problems with reading and replying to emails at the right time due to backlogs consisting of unanswered emails or time spent searching for information in email systems. This inefficiency of communicating results in lost information, and the responsiveness decreases, which negatively affects the productivity for both individuals and corporate (ibid.). Giacoletto and Aberer (2003) state different behaviors leading to email overload. Users file down their emails into folder structures to save emails for the future. People also tend to organize their email folders and directories according to their daily income of messages. Further, users keep emails within their inbox even though they want to clean it. Users also want to investigate the importance of an email before taking action (ibid.). Pignata et al. (2015) advocate that organisations with the need to decrease email overload should increase education in email management and implement protocols towards the communication process.

Shared mailboxes

Email can be used in collaboration with others and not only for personal use (Muller & Gruen, 2005). Colleagues can have shared responsibility and access over the same emails through a shared mailbox. Organisations can create a shared mailbox with names towards a function or service to enable customers to have one easy way to communicate (ibid.).

Shared mailboxes in Office 365 have the same features as personal mailboxes, but shared mailboxes have one owner who can enable other people to access them (Bowes IT solutions, 2021). Receiving emails from a shared mailbox does not include the sender’s email address. Shared mailboxes enable the users to create subfolders for the inbox to organise the emails (ibid.). Most businesses have a shared

mailbox as it enables more people to see and manage the same emails (Babinchak, 2017). A shared mailbox enables colleagues to access other's emails that would have been stuck within their personal mailbox, which removes the need to keep old employees' email accounts active when they have quit (ibid.).

3.4.2 Other communication tools and channels

Phone

Poznańska and Badzińska (2017) states that mobile technologies enable participants in the communication process to be less separate and move towards more integration and networking possibilities as the distance between the participants has lost its impact. Mobile technology has influenced business communication between stakeholders, third parties, and consumers. The development of new mobile technology can enable organisations to make their work practices more flexible. Mobile communication impacts the tempo and structure as it enables companies to expand their library communication tools such as social media. Mobile communication allows businesses to respond to customers instantly (ibid.).

Ticket system

A *ticket system* is a cloud-based tool that enables clients to get support through pre-defined solutions (Gohil & Kumar, 2019). The client puts in query requests in the system and then receives a solution. If there are query requests without any predetermined solutions, the request is forwarded to the support team to resolve. The request module handling all incoming requests helps the organisation that offers the solutions for the clients to increase speed in handling each ticket, distribute the tickets to the correct department and combine similar requests. The module enables the organisation to increase their goal and reaction time (ibid.).

SMARP

SMARP is a platform that offers communication through omni channels with an easy interface that enables employees to create and share content in one place (SMARP, 2021a). Further, one of the channels that SMARP offers is an intranet where the users can share personalized messages and information with several employees. Organisations can through SMARP, drive advocacy, and the system can analyse the performance of teams, individuals, and regions (ibid.). Users can through SMARPs' Publishing Studio create and share content to a chosen audience within the organisation (SMARP, 2021b). The Publishing Studio enables users to communicate faster to the right audience and has an Automation Language Detection to make notification instant. Employees can through SMARP communicate wherever they are as SMARP enables users to communicate in real-time through both computers and phones (ibid.). An organisation can get workforce insight through SMARP as the platform can inform and help with data-driven decisions (SMARP, 2021c).

4. Pre-Analysis

This chapter contains a pre-analysis of the data collected from interviews, focus groups, and data from mailboxes and is divided into three parts. The first part analyses interviews with managers and operational workers. The second part consists of analysis of each focus group session. The last part consists of analyses of the retrieved data from the shared mailboxes.

4.1 Interviews

The pre-analysis of the interviews is divided into two parts, interviews with DM and interviews OW. Different types of users were encoded and listed below:

- Participants using only shared mailboxes for operational tasks are encoded to Shared Mailbox User, SMU.
- Participants using only personal mailboxes for operational tasks are encoded to Personal Mailbox User, PMU.
- Participants using both types of mailboxes for operational tasks are encoded to Mixed Mailbox User, MMU.

4.1.1 Interviews with DM

All five departments use primarily email to communicate. Microsoft Teams, Skype, phone, and SharePoint are used to a limited extent. One of the DMs stated that email is a good way to communicate through as it is easy to understand and handle, however, it has limitations regarding traceability. The utilization of email is used differently between the investigated departments, this is shown in table 4. Three out of five departments only use shared mailboxes for operational tasks, one department only uses personal mailboxes and one of the departments mainly use personal mailboxes and utilize the shared mailboxes when someone in the team is absent from work. Table 4 shows numbers of shared mailboxes and teams within the department.

DM1 argued that a shared mailbox minimizes control of the emails, if an email has been handled or not, and if the mail has reached the right receiver. Further, this DM emphasizes that a shared mailbox requires a lot of effort and is time-consuming as one needs to inform colleagues when an email is received in the inbox. Most DMs argued that a shared mailbox is time-consuming due to the sorting processes and activities associated with keeping control. According to DM1, a shared mailbox is not necessary when employee retention is high. However, the other DMs emphasize the benefit that all information is accessible in a shared mailbox and therefore enable employees to backup and support each other when it is needed. They also argued that shared mailboxes increase collaboration and common views within the team. DM3 emphasizes that the information and questions in the emails are aimed towards the departments and not specific persons.

Another benefit mentioned is that shared mailboxes allow flexibility of responsibility areas and enable rotation, which decreases the department's vulnerability without confusing the senders. It is also beneficial for the sender as there is only one contact area to send information and questions to, by that the sender is ensured that it has been delivered to the right mailbox.

According to two of the DMs, the name of the shared mailboxes does not really represent the purpose of the mailboxes. Therefore, people tend to see the mailbox as a junk box and send everything to it. The

departments Material Trading Overseas Ghent and Manage Packaging send out contact matrix and contact manual to minimize the issue to receive unnecessary email that does not belong to the mailboxes.

Table 4: Way of communicating within each team

Department Manager	**Department**	**Number of operational workers**	**Usage of mailboxes**	**Shared mailboxes**	**Flows / areas handled in each shared mailbox**
DM1	Transport Products Gothenburg	7	Personal mailbox	0 pieces	
	Transport Products Eskilstuna	6	Mixed usage of personal mailbox and shared mailbox	2 pieces	Standard transports
					Special transports
DM2	Material Trading Overseas Ghent	13	Shared mailbox	4 pieces	Customer service overseas
					Direct flows
					Xdock administration
					Blocked invoices
					Retentions
					Kaluga
DM3	Material Trading Overseas Gothenburg	16	Shared mailbox	18 pieces	Salsa&Samba
					Kalinka
					Asia, VBC, General Cargo
					US
					Air Export
					Finance +
DM4	Manage Packaging	13	Shared mailbox	3 pieces	Regional planner
					Distribution planner
					Distribution managers
					Special planner

4.1.2 Interviews with OW

Email is the central communication channel for all five departments, and they use the communication tool Microsoft Outlook. The departments send and receive several types of messages through emails, and these can be clustered as information, documents, or tasks. These clusters are shown in more detail in table 5.

Table 5: Types of messages that are sent and received through email

Information	**Documents**	**Tasks**
General information	Bill of Lading draft	Book transport
Issues	Invoices	Approval of documents
Deviation	Sea Waybill	Ask for documents, information, or action
Information necessary to perform action	Certificate of Origin	Overall actions
	EUR.1 movement certificate	
	Shipping instructions	
	Quotations	
	Delivery notes	
	Importer Security Filing	
	Other export documents	

The departments utilize some of the integrated features that Microsoft Outlook offers. Four SMU mentioned that they use rules to sort some of the most frequent incoming emails. They decrease time spent on sourcing and minimize the risk of sorting wrong by using rules. Two SMU have email templates that they use for frequently sent emails. All respondents use automatic replies in their personal mailbox when they are absent from work to inform the sender that they are out of office and whom to send urgent emails to. However, the average of estimated time spent in the mailboxes is 48% of the working hours.

The departments use Microsoft Teams, Skype, phone calls, and SharePoint to a minimal extent as there is a lack of traceability and visibility when using these tools and channels. The respondents use these tools and channels to get faster answers. Some of the respondents' state that they, on some occasions, use phone calls when they do not understand an email that they have received or when they need a quick response. However, to have traceability they always need to send an email afterwards so that both parties always have a written proof of what has been agreed on.

Activities associated with email

All respondents except one use folders to varying degrees to sort all incoming emails and keep control over the mailboxes. Categorisation is used by ten respondents and follow-up flags are used by five respondents.

Department 3, 4, and 5, which mainly use shared mailboxes, have a standard structure of how they are working. Department 3 has folders named by destinations and flows and to some extent for documents. Four out of five respondents use the same structure to have control over the mailboxes. They have one person that is responsible for each shared mailbox. To be responsible for a shared mailbox means that one is responsible for sorting all incoming emails to the correct folder, answering all emails that are not of operational manner, and making minor improvements, such as minimizing unnecessary email that has been sent wrongly. All incoming emails in the inbox get sorted in the correct folder. People in the group can then choose which email to handle from whichever folder. When handling an email, they mark it as read and categorise the email with their name. If an email needs action later, they leave it as unread and categorise it with the appropriate action. Informative emails will just be marked as read with no categorisation. However, Three out of these four respondents use follow-up flags to a limited extent. The other respondent work differently, all incoming emails are left in the inbox except emails including documents, they are sorted in folders named after the suppliers. The respondent does not use categorisation either but in some cases follow-up flags are used if it is an email they do not understand. The emails are prioritized by the level of urgency, which depends on the deadlines for the vessel.

Department 4 uses folders and categorisation in another way than department 3. Four out of six respondents at this department work in the same way and have the same standardised structure to keep control over the mailboxes. People working in the shared mailboxes are responsible for different flows. Therefore, all incoming emails are categorised by name and in some occasions by actions. It is first after an email has been handled that they mark it as read and move it to a folder. The fifth respondents in this department have another standardised structure. This respondent does not use categorisation, the emails are sorted in folders depending on what type of email it is. Examples of folders are “incoming booking”, “ongoing booking”, “waiting for POSO”, and “achieve”, the mailbox has around forty different folders. However, they move an email to archive when it is handled. The last respondent in this department is working alone in a shared mailbox and has no standardised structure. However, the respondent uses folders and categorisation to some extent. The respondents only mentioned two colleagues in the department that used follow-up flags.

Every respondent from department 5 works in the same way. Every person working in a shared mailbox has their own folder and all incoming emails are then sorted into the correct folder. Everyone has their own structure in the folders to keep control over the emails. However, it is only one out of three respondents that use categorisation. When an employee backup or supports a colleague, they put the absent colleague's email address in CC.

Department 1 and 2 have no standardised structure on how to handle incoming emails and to keep control over the mailbox. None of the respondents in department 1 and 2 use either categorisation or follow-up flags. MMU uses folders to a limited extent for frequently received emails or big projects before the planned absence. If they want to save any email, they forward it to their personal mail. Five SMUs have stated guidelines on how to prioritize the emails. There are five different priority guidelines used. The first one, use a priority plan available on SharePoint that they need to follow, this priority plan is different depending on flow. The second one, prioritizes emails depending on the sender's and carrier's time zone. The third one, prioritize emails depending on the deadline for the transports. The

fourth one prioritizes bookings meanwhile the last one prioritizes the emails after they were received. Almost half of the respondents argued that they do not prioritize emails, that every email is equally important, or that they prioritize by their own judgment and experience.

All respondents emphasize the importance of keeping the mailboxes clean. However, this is done in two different ways. Four respondents delete most of the emails, they only save important emails and, in some occasions, the latest email in an email thread. One MMU does not save any emails in the shared mailbox, if an email needs to be saved it gets forwarded to their personal mailbox. Five respondents maintain a clean mailbox by sorting all emails into folders and by handling all the emails before the day ends.

However, 5 respondents perform extra activities to maintain control over the mailbox and the operational tasks. They use a Microsoft Excel file where they put down or mark everything that they have done. They do this to increase traceability and visibility of the work that they are doing.

Monitoring is the last activity associated with Microsoft Outlook. The SMUs constantly monitor the shared mailboxes throughout the whole day, but they only check their personal mailbox once or twice a day. There are some exceptions, when a SMU has been assigned its own specific tasks then the SMU can handle this task in the personal mailbox and therefore monitor it several times a day. One MMU checks the personal mailbox and the shared mailbox only a few times a week at specific times. The PMUs constantly monitor their mailboxes.

All the respondents mostly need to retrieve information or make activities in several other systems in order to answer or send emails or to take action.

Quality aspects with email

The respondents brought up some quality issues when using email. Respondents mentioned that it is overwhelming to work in too many shared mailboxes, one respondent states that working in six mailboxes is too much. All respondents also experience many unnecessary emails due to double emails to several mailboxes, both personal and shared mailboxes. The respondents emphasized that many people think adding many mailboxes in an email will give a faster response. Another email issue is that there are limitations on how big the attached files can be in an email, and due to this, they receive or send several emails to overcome this problem. The problem that the respondents experience due to the fact mentioned above is that they receive too much email and information. The consequence of this is that emails can be overlooked but also the response time to email increases. However, the respondents also pointed out that if the information or email is not accessible, it will generate significant consequences when performing their operational tasks. Another consequence of this is that the respondents experience that it is hard to keep control over the mailboxes. One respondent stated that one of the shared mailboxes had 251 folders and many respondents emphasize the importance of having good structure when handling email. Four respondents also mentioned that having email discipline and to have good structure is of importance to keep control over all incoming emails. A quality issue brought up by two respondents is that it is time-consuming to monitor and sort all the emails.

Only two respondents brought up the importance that the emails are sent to the correct mailbox. On the contrary, the majority of respondents brought that up as a quality issue, that they receive unnecessary and wrongly sent emails. Two respondents also stated that the response time should be short, one of the respondents thought that one day in response time was good.

Two respondents also stated that communicating through email results in vulnerability as they are helpless if they would be without an internet connection or if emails for some reason do not get sent or received. Respondents also brought up the problem that everything is manually handled and therefore mistakes often occur, e.g., sort email wrongly, mark an unhandled email as read, send and receive wrong information, or make the wrong prioritization. Many respondents also argue that there is a lack of traceability and visibility when handling a large number of emails.

Quality aspects of the email content

The respondents emphasize that the quality of incoming and outgoing emails is of high importance. More than half of the respondents argued that an email should be concise, although two respondents experience that they receive long emails. The majority of the respondents think it is essential that an email include only necessary and relevant information and that all information needed is included and correct. On the contrary, five respondents experience this as a problem. One respondent stated that wrong information in an email can be costly, both due to extra work but it can also generate fees if delivered documents are incorrect. The majority of the respondents mentioned that the clearness of the message, information, question, and expected response is of high importance. However, two respondents experience that they receive unclear emails. Only one respondent brought up that an email should be easily described so that it requires little effort to understand the email. Two respondents think it is essential that the questions in an email are not too open or too many. Five respondents were in favor of visualization in an email, e.g., by adding pictures or highlighting the most important message delivered in the email such as specific information, question or expected response. However, it is only two respondents that have stated that they use visualization when sending emails. Three respondents think that long email threads should be summarized. This is a current problem within the departments as half of the respondents experience long email threads.

It was found through the interviews that the body in an email also affects the quality. One respondent thought it was important that both the sender and receiver use the same language, not only when talking about the words but also numbers. Two respondents stated that they experience problems due to language, that it sometimes was hard to understand the emails as the grammar was poor or that they talked about different numbers concerning the shipments. One respondent emphasizes the importance of spelling correctly to easily understand the message and to be able to convey the content to the receiver. Two respondents also argued that the tone of a message is important as written text easily gets misunderstood, but also that one can easily hide behind the screen and therefore have a harsher attitude. Therefore, they think it is essential to be friendly, nice, and respectful when writing emails. Half of the respondents also stated that the subject is of importance as it makes it easier to sort and categorise the email to the correct person or flow without reading the email. The respondents also brought up that a good subject also makes it easier to prioritize the emails. Although, three respondents perceive the problem with inadequate subjects.

Despite the fact in the above paragraphs, the majority of respondents argued that the overall quality is good. However, one respondent emphasizes that the quality of an outgoing email depends on the quality of the incoming email. One respondent also argued that it is inefficient to write emails and chat messages and that it is better to make a call. Two respondents experience overall lower quality when the workload is high and when there are many emails to handle. Four respondents perceive lower quality, such as unnecessary emails, wrongly sent emails, and complicated content in a mail when the sender is a new employee.

Table 6 shows what employees at TOE perceive as good quality compared to the quality issues that they experience.

Table 6: Perceived as good quality and current quality issues at TOE

Perceived as good quality	**Quality issues at TOE**
Concise email	Long emails
Only relevant, necessary, and correct information	Irrelevant, unnecessary, and incorrect information
Clearness	Unclear emails
Include visualization	Not many uses visualization
Summaries long email threads	Long email threads
Using the same language	Language problems
Good subject	Inadequate subject
Not too many questions or too open questions	Lower quality when workload is high
Spelling and grammar	wrongly sent emails
Using the right tone	Unnecessary emails
Easily described	

Personal mailbox

One of the benefits mentioned by a respondent is that a personal mailbox is easier to keep clean and control over, which is due to two things. Firstly, that there are fewer incoming emails as only one person is working in the mailbox. Secondly, one can delete emails that one does not think is important as one does not need to take others' opinions and thoughts into consideration.

That information is not accessible for other colleagues is a drawback with personal mailboxes that all respondents mention. The consequences of this mentioned by many respondents is firstly that it is hard to backup and support colleagues as they cannot follow-up on the operational tasks and issues, what has been done or needs to be done. This results in extra work as they need to contact suppliers, markets, and carriers to know the status of the situation. On some occasions, they need to give out their password to their Volvo Group account so that colleagues can sign in to get access to this information. Secondly, the shared knowledge and collaboration decrease within the department due to the fact that all information is not accessible. To oppose this, they need to put extra time and effort into sharing necessary information to their colleagues through either email, SharePoint, chat messages, or calls. The respondents also argued that the department gets more vulnerable as one cannot perform the operational tasks or urgent issues if a person is absent. Respondents also mentioned that a drawback is that their internal and external contacts need to keep several mailboxes in mind and have the knowledge of which information to send to which mailbox.

There are some statements that have been brought up by several respondents that contradict each other. Some respondents have mentioned that a personal mailbox will decrease the stress as one does not see emails that do not concern you. In contrast, other respondents argued that it would increase the stress as all responsibility is put on one person. Another contradiction is that some respondents think a benefit with a personal mailbox is that it is only your own responsibility to keep control over the mailbox and handle the emails and operational tasks. Meanwhile, other respondents see this as a drawback as a lot of pressure is put on only one person. The respondents also have different views when it comes to prioritization. Some respondents argued that it is easier to prioritize the emails and tasks as one receives all emails in one mailbox and that all the emails only concern you. Other respondents argue that it is harder to prioritize as everything is mixed in one mailbox and that one cannot focus on only one market.

Some respondents also mentioned that it is a risk that emails get overlooked and that one misses urgent emails as the mailbox are not monitored all the time. Another risk is that MMUs forget the shared mailbox and only focus on the personal mailbox. One respondent also mentioned that there is a risk that several people answer the same emails as it is sent to several persons and that one answers an email that was not intended for you to answer. However, the most significant risk with personal mailboxes, mentioned by almost half of the respondents, is that giving out your password can lead to much damage.

Shared mailbox

All respondents mentioned that a benefit with shared mailboxes is that information is accessible. There are several benefits with this mentioned by the respondents. Firstly, a shared mailbox is good for backup purposes. It also makes it easy for all to trace the information. Secondly, two respondents emphasize that the accessed information enables more visibility, as one states that it gives a good overview of the mailbox, and one respondent mentioned it enables team members to check where their colleagues are in their process. One MMU and two SMU states that the visible and traceable information enables the team to have a rotation system of employees. Further, the rotation system enables the team to increase knowledge in the team and increase backup possibility and efficiency.

As several people can work within a shared mailbox, many respondents mentioned that the mailbox is always monitored. For example, one respondent mentioned that even if one person is in a meeting or absent from the computer for some hours, the mailbox is still monitored, and others can answer urgent emails. One MMU user emphasizes that a shared mailbox contributes to a more standardised way of working and therefore increases the efficiency of handling emails. Two respondents stated that a benefit of communicating through a shared mailbox is that the emails get less personal and that the emails that are sent and handled as a function and not as a person. One respondent state that shared mailboxes enable the DMs to notify and inform their team with important information and deadlines in an easy way. Only one respondent mentioned that using a shared mailbox decreases users' possibility of performing illegal actions, as more people have access to the emails.

Several respondents stated that it is time-consuming to monitor a shared mailbox and hard to control, as one respondent states that not everyone has the same mail discipline. One respondent state that there are a lot of unnecessary readings of emails that do not concern you when being a part of a shared mailbox. Several respondents emphasize that too many people can be involved in a shared mailbox, leading to uncertainties of who is responsible for what. One PMU argued that all members in the team need to know everyone's work and that it is not manageable. Several respondents state that it can be hard to know which shared mailbox to send to, as shared mailbox names can be confusing for the sender.

Two respondents stated that it is hard for new employees to adapt to the way of working in a shared mailbox, as the employee needs to learn the responsibility areas for many people, and that takes time. Some respondents think that a shared mailbox is not necessary when only one person is working within the shared mailbox.

Respondents state the risk of too many people in one mailbox increases the risk of making mistakes. Respondents brought up risks such as emails not getting handled as colleagues mark unhandled emails as read and that others may wrongly delete emails. When there is much work with a shared mailbox, several respondents state that their personal mailbox gets affected as they forget to monitor it. One SMU stated that there are 1340 emails in the personal mailbox due to receiving double mails and can therefore forget to monitor the shared mailbox. Another risk brought up is that people may work on the same tasks or another person's tasks, as everyone receives the same emails. Respondents mentioned that there is a risk of emails getting sorted wrongly, people may forget to categorise. One respondent argued that there is a risk of sending emails under other's names when being in a shared mailbox.

Table 7 presents the benefits, drawbacks, and risks of using personal and shared mailboxes, mentioned by employees at TOE.

Table 7: Benefits, drawbacks, and risks with personal and shared mailbox

	Personal mailbox	**Shared mailbox**
Benefits	• Easy to keep clean • Easy to have control • Can easier delete emails	• Easy to backup and support • Information accessible • Visibility • Traceability • Less personal • Everything to one mailbox • Always monitored • Enable rotation system • Standardised work • Enable common reminder notifications
Drawbacks	• Information not accessible • Hard to backup and support • Give out password • Decreased collaboration & knowledge • Hard to follow-up • Confusing for the sender to know what to send where	• Hard to keep control • Unnecessary reading • Complicated for new employees • Confusing when to many works in the same mailbox • Confusing for the sender to know what to send where
Risk	• Overlooked emails • Forget the shared mailbox • Answer others email • Give out password	• Overlook emails • Affects the personal mailbox • Easy to do mistake

Comparison between shared mailbox and personal mailbox

Most respondents mentioned that information is easy to access and traceable in a shared mailbox. Meanwhile, it is hard to access in a personal mailbox, as no one can without password access to others personal mailboxes. Most respondents stated that personal mailbox is hard to backup meanwhile they stated it is easy to backup in a shared mailbox. This is because a shared mailbox gives access to all information, but for personal mailbox, the users need to forward information or give out the password to their personal mailbox. As respondents stated that shared mailbox contributes with more visibility of the information, it is opposite regarding personal mailbox as only the owner of the mailbox can see the information. One respondent argued that they get vulnerable when using personal mailboxes when one is sick, as the information is locked into different mailboxes.

4.3 Focus groups

The pre-analysis of focus groups is divided into three parts; Session 1, Session 2, and Session 3. The participants used personal and shared mailboxes in different ways to handle operational tasks.

4.3.1 Session 1: Benefits, Drawbacks, and Quality issues of personal and shared mailboxes

Personal mailbox

Both groups agreed that personal mailboxes are good for control. According to both groups, a benefit with personal mailboxes is that the user is in charge of handling all incoming emails and knows what has been read, handled or not. Group 1 emphasized that when being the only user of a mailbox, there is no risk that others delete or read emails not targeted to them, which SMU mentioned was an issue for shared mailboxes. Group 2 emphasized that personal mailboxes contribute with a better overview. However, SMU argued that shared mailboxes have better control because they assign emails to folders and categorise them to people. According to Group 2 the closed loop between two or more people is the major advantage with personal mailboxes. This would, according to SMU, decrease the unnecessary readings that can occur in the shared mailboxes as the information within the closed-loop is not concerning anyone else.

Both groups agreed that personal mailboxes decrease the accessibility of information. Group 1 stated that nothing gets read or handled if a user forgets to mark ‘out of office’ and does not change the settings so that all emails should be automatically forwarded. The responsibility is on the user to share the information, and SMU further stated that information would get lost if the user forgets to share it.

Group 2 agreed that one could not backup or support colleagues easily as the information and email are not accessible in a personal mailbox. Group 2 mentioned the issue that people tend to send an email to more people than necessary by putting them in CC. According to Group 2, these unwanted CC emails originate from people wanting to receive answers faster and therefore put more people in CC.

Group 1 argued that the responding time of an email is longer in a personal mailbox compared to a shared mailbox. This is because a shared mailbox has more people looking into the mailbox and therefore is constantly monitored and can faster take action. SMU argued that if a person has more experience than the others in a team, then that person would receive more emails than the colleagues because people tend to send to persons with more experience. Group 1 emphasizes that the complexity of retrieving information from a personal mailbox when backing up or supporting a colleague is a

quality issue because of the extra efforts needed. One key quality issue for personal mailboxes mentioned in Group 2 is the traceability. Traceability of information can be challenging if the quality of the subject of an email is low, meaning the subject is irrelevant to the text within an email's body. Group 2 further stated that if the mailbox contains many emails, it increases the hardship of searching for information.

Shared mailbox

Both groups agreed that shared mailboxes are good for backup purposes because when someone is away, then another person has access to the information and can backup. Both groups emphasize that receiving emails to a function instead of a person increases the visibility of information and the possibility for more people to take action. Group 2 argued that having a single point of contact to a function makes it easier for the sender to know where to send the email, instead of searching whom to contact within a team. PMU pointed out that there is a possibility of uneven workload in a shared mailbox due to a shared responsibility to sort and take action on the emails.

Group 1 stated that it is time-consuming to read the whole thread of an email to be able to take action. SMUs from Group 1 have this problem as everyone within the team can take action on all incoming emails, and one person may have started the email thread, and another will later take over. Group 1 also argues that shared mailboxes have increased workload due to monitoring the mailboxes and that there is a risk that one person sorts the majority of the emails. Group 2 stated that having more people within the same mailbox creates the chance of two people performing the same tasks related to an email, resulting in unnecessary work. Group 2 also argued that it is harder to get an overview due to the large set of emails in the same mailbox. When having a large set of incoming emails, SMU stated that it is harder to know what is important or not and needs to be prioritised. MMU stated that this issue does not concern their group because their team is small but that they can understand that this is an issue for larger teams.

A quality issue with shared mailboxes mentioned by both groups was the risk of receiving double emails, meaning receiving the same email to both the shared mailbox and to their personal mailbox. SMU argued that this happens because senders think they will get a faster response when including both mailboxes. The people sending the double emails get access to the SMU's personal mailbox addresses through the signatures put in each email. Group 1 mentioned that not everyone has the same email discipline. SMU mentioned that everyone working in the mailbox gets affected if someone has a different email discipline. Group 1 also brought up that there is a risk that a person may answer email that was not directed to that specific person as not all incoming emails are targeted to everyone working in the mailbox. Group 2 stated that one of the quality issues is that they do not have a standardised way of working in the shared mailboxes. Group 2 also mentioned irrelevant subjects as an issue in the same manner as mentioned for personal mailboxes, as it makes it harder to search for emails.

The results from both groups are presented in table 8. However, this is the result presented from the groups during session 1 and not the final pre-analysis result where statements and opinions from the different users are shown.

Table 8: Result presented from session 1

		Group 1	**Group 2**
Personal	**Benefits**	Control of work tasks	Closed loop
		User control the mailbox	Overview and control
	Drawbacks	No access to mailbox	No access to mailbox
		Not sharing the information	Unwanted CC emails
	Quality	Longer response time	Irrelevant subject
		Complex backup	Hard to search information
Shared	**Benefits**	Backup	Backup
		Receive email to a function	Single point of contact
	Drawbacks	Monitoring workload	Double work
		Time-consuming to read	Hard to get an overview
	Quality	Double emails	Double emails
		Different email discipline	Irrelevant subject
		Wrong person answers	No standardised way to work

4.3.2 Session 2: Suitable contexts for personal and shared mailbox

Personal mailbox

Both Group 1 and Group 2 stated that the usage of personal mailboxes is suitable when the team is small and does not work with too many markets or suppliers. One PMU stated that five people is a fair number for a small team. Group 1 emphasizes that personal mailboxes are more suitable for users working with personal tasks that do not concern others or when there are defined lines between responsibility areas and that the tasks do not overlap. Group 1 also stated that personal mailboxes are suitable when not having a rotation system because of the trouble to get access to a personal mailbox. Group 2 stated that working with too many markets for a personal mailbox user is when having more than 10 markets. However, one PMU argued that personal mailboxes are good when working with a large number of markets or suppliers. Group 2 further argued that personal mailboxes are suitable when their contacts do not overlap in the team so that each contact knows whom to contact for specific tasks. Group 2 stated that a personal mailbox is suitable to handle emails of less urgency, as they define urgent emails as emails that need answers within one hour, which can be hard in a personal mailbox.

Shared mailbox

According to both groups, when receiving many urgent emails, the shared mailbox is good because it has more people who can take action on the incoming emails. They further stated that it is suitable to use a shared mailbox when the team has a rotation system or has several responsibility areas within the

team. The rotation system is defined by Group 1 to be when employees change work tasks each week. Group 1 stated that shared mailboxes are suitable when several people work in the same flow or have the same markets and carriers. Further, a shared mailbox is good when the carrier has many different final destinations, because then the carrier only needs to have one mailbox in mind when sending emails instead of several personal mailboxes. Group 1 agrees that shared mailboxes are suitable for a customer service context, as the defined lines between responsibility areas can be vague. Moreover, they stated that shared mailboxes are suitable when there is an uneven workflow, and the team needs to split the workload within the team. According to Group 2, when a team has a lot of incoming emails and more than 10 markets, it is suitable to have a shared mailbox. Group 2 remarks that it is better to have one shared mailbox instead of one for each market, as the incoming emails can be sorted into folders representing each market. MMU from Group 2 mentioned that even when not having the need to frequently use a shared mailbox, they are still good for sharing information with colleagues.

The results from both groups are presented in table 9. However, this is the result presented from the groups during session 2 and not the final pre-analysis result where statements and opinions from the different users are shown.

Table 9: Result presented from session 2

	Group 1	**Group 2**
Personal mailbox context	Small team	Small team
	Few markets	Few markets
	Few suppliers	Few suppliers
	More personal tasks	No overlapping contacts
	Tasks do not overlap	Less urgent emails
	No rotation system	
Shared mailbox context	Bigger team	Bigger team
	More urgent emails	More urgent emails
	Have a rotation system	Have a rotation system
	Tasks overlap markets/suppliers	More markets
	Customer service	A lot of incoming emails

4.3.3 Session 3: Evaluation of a ticket system

Possibilities

Both groups stated that a ticket system would be suitable for supporting functions as several participants have seen similar ticket systems been used by IT support. Both groups saw the possibilities of using ticket systems for handling frequently asked questions and occurring tasks. Both groups stated that a benefit with the ticket system was the presorting of all incoming tickets. Group 1 argued that a ticket

system would work well when everyone in the team can handle all types of incoming tasks. Group 2 stated that the way of prioritising and locating information would be easier, as the tickets already are marked with urgency level, and the information is stored in a clear way, making it more manageable to follow up on tasks. Group 2 stated that the ticketing system would increase the incoming information quality for operational tasks, as the information needed is already asked for in the ticket. Group 2 argued that a ticket system would enable a team to work more in a standardised way, as less communication is needed.

Limitations

Both groups stated that a ticket system is not applicable for all types of work. MMU and PMU stated that the ticket system is not suitable for work concerning special cases and tasks, as each case and task is not like the other, and it is hard to standardise. Group 1 stated that it is not necessary to implement a ticket system for a smaller team consisting of 5 people. At the same time, they argued that each worker within a team needs to know everyone's work to be able to use a ticket system, which is hard for a team with a large set of different tasks. Group 1 argues that a ticket system would, for some bigger flows, generate a long list of optional tickets to choose between when creating a ticket. They argued that this would lead to confusion, errors and be time-consuming for the users. Group 1 pointed out the difficulty of using two systems, email and ticket system, as users always have specific questions that cannot be answered through a ticket system. Group 2 argued that using a ticket system would generate more stress, as some suppliers prefer to communicate through phones and therefore need to communicate through several tools and channels. Group 2 argued that a ticket system without a chat function would decrease personal communication or create more workload when jumping between communication tools and channels. Group 2 stated that both external and internal workers need to be educated in the ticket system before implementation, which is time-consuming. Further, they emphasized that without education, users would go back to their previous communication tools and channels.

Features wanted in a ticket system

Group 1 wants the ticket system to be integrated with their other systems to easier find and use information. However, they also stated that the ticket system should enable workers at TOE to contact external parties by sending tickets. They further stated that the ticket system should enable users to put in free text to further describe issues or ask questions when creating tickets. However, Group 1 emphasizes that the ticket system should only show tickets that are of relevance for the users' responsibility area or department so that they, with only one mouse click, can create a ticket. Moreover, they also want to be able to filter the incoming tickets with only one mouse click. Group 2 wants the ticket system to ask the users to fill in all necessary information so they can handle each ticket right away. They also stated that the process to find the correct ticket should only be three clicks away. Further, the ticket system should enable users to send emails, and that these emails should be converted into tickets and include a summary of the sent email. The ticket system should not be used for a function with a lot of incoming requests, as it would generate too many tickets. Further, Group 2 mentioned that a chat function should be integrated with the ticket system.

The results from both groups are presented in table 10. However, this is the result presented from the groups during session 3 and not the final pre-analysis result where statements and opinions from the different users are shown.

Table 10: Result presented from session 3

	Group 1	**Group 2**
Possibilities	Good for supporting function	Good for supporting function
	Good frequently asked questions and tasks	Good frequently asked questions and tasks
	Everything is presorted	Everything is presorted
	Good when the group can work with everything	Easy to prioritize
		Easy to follow up
		More standardised way of working
Limitations	Not applicable for all types of work	Not applicable for all types of work
	Unnecessary for small teams of 5 people	Stressful for ordinary emails, teams chat function and phone
	Needs a long list of tickets for bigger flows	Need education before implementation
	Needs to monitor both email and ticket systems	Decreases personal communication
Wanted features	Be able to put free text on a ticket	Want to receive all necessary information
	System integrated with each other	Emails summaries should be included when converted to tickets
	Be able to contact external parties	Chat function

4.4 Mailbox statistics

Three mailboxes were analysed, and these will further be named: Mailbox 1, MB1; Mailbox 2, MB2; Mailbox 3, MB3.

The available data from the three shared mailboxes were spread over several years, the start date differed, but all of them had data for 2021. There were significant differences between the earlier years compared to 2021 in terms of the total received and sent emails due to the fact that they constantly delete emails to keep them clear and create available capacity in the mailbox. Therefore, only data from 2021 was further investigated. Although it could be seen that MB3 does not delete emails as each year consists of almost the same amount of total incoming and outgoing emails.

MB1 and MB2 receive and send in total around 33 500 emails per half year meanwhile, MB3 only send and receive around 7000 emails per half year, as seen in figure 7. Over the course of a working day, MB1 and MB2 receive and send an average of 257 emails meanwhile, MB3 receives and sends 54 emails. MB1 sends around one-sixth in comparison to what they receive. MB2 sends around three

quarters in comparison with what they receive. Meanwhile, MB3 sends half the amount of emails in comparison with what they receive. This shows that a person on average receives 21,5 emails per day and sends 5,5 emails per day.

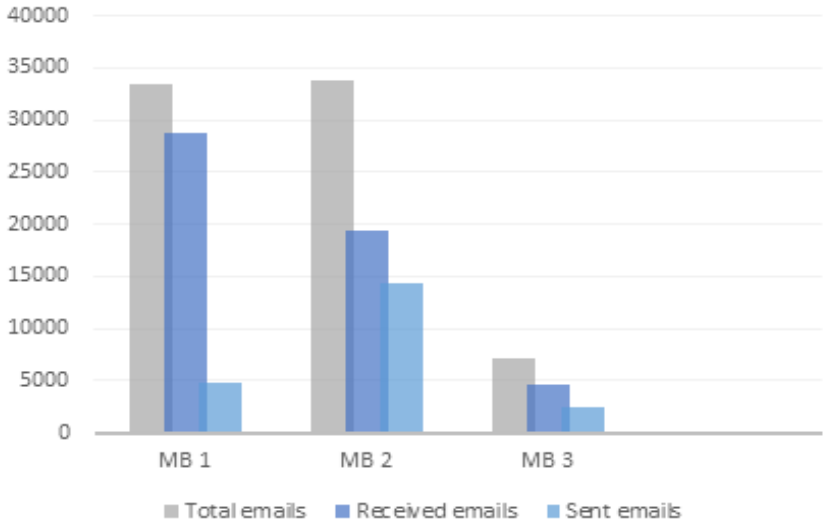

Figure 7: Amount of sent and received emails

34% of the incoming email to MB1s is from a Volvo Group domain as seen in figure 8. However, almost 40% of these are from the same sender address. Almost 17% of all incoming emails in MB2 are from a Volvo Group domain, see figure 9, and 26% of those are from their own email address, which means that they are sending many emails to themselves. 31% of all emails received in MB3 are from a Volvo Group domain, see figure 10. However, around 50% of all emails that are received and sent in the MB1s mailbox include addresses in CC meanwhile, 32% of MB2 emails and 25% of MB3s emails include addresses in CC.

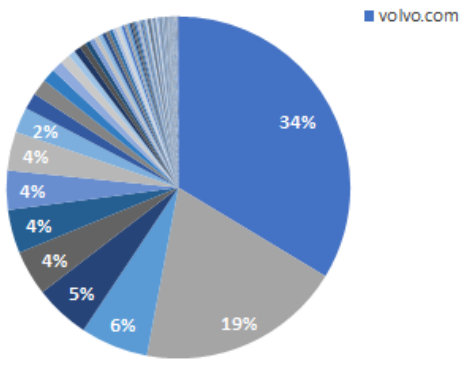

Figure 8: Sender domain for received emails - MB1

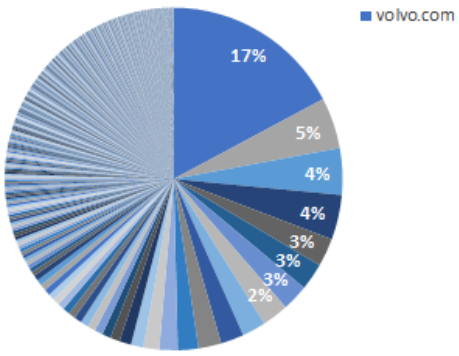

Figure 9: Sender domain for received emails - MB2

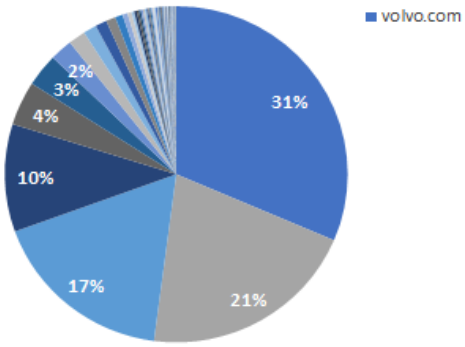

Figure 10: Sender domain for received emails - MB3

Average of emails in an email thread is 10 emails in MB1, 19 in MB2 and 14 in MB3. The average amount of emails within an email thread when attachment is not included is 18 emails for MB1, but if attachments are included in the thread, the average decreases to 5 emails. MB2 has an average of 20 emails in an email thread when not including attachments, and if attachments are included, it decreases to 13 emails. MB3 has an average of 19 emails in their email thread when not including attachments, and if attachments are included, it decreases to 9 emails. For these mailboxes, the length of an email thread without attachments is 19 emails. This shows that by including attachments in an email thread, the thread will decrease by an average of 47%.

It was also found that attachments affect the length of email to some extent. The length of a received email to MB1 decreased by 19% if an attachment was included. For MB2 and MB3, the average length for received emails was almost the same. Meanwhile, it showed that the length of emails that were sent from all three mailboxes increased when attachments were included.

However, two of the mailboxes received almost 60% of emails that included attachments, see figure 11. Meanwhile, the third mailbox only received around 20% of emails that included attachments. Further, around 50% of the sent emails include attachments in two of three mailboxes. Meanwhile, almost 10% of the sent emails in the third mailbox included attachments. Between 40-60% of the emails in 2 of 3 mailboxes include attachments and 15% of the emails in the third mailbox had an attachment. However, one needs to consider that visualizations such as pictures, print screens, and highlights are not included.

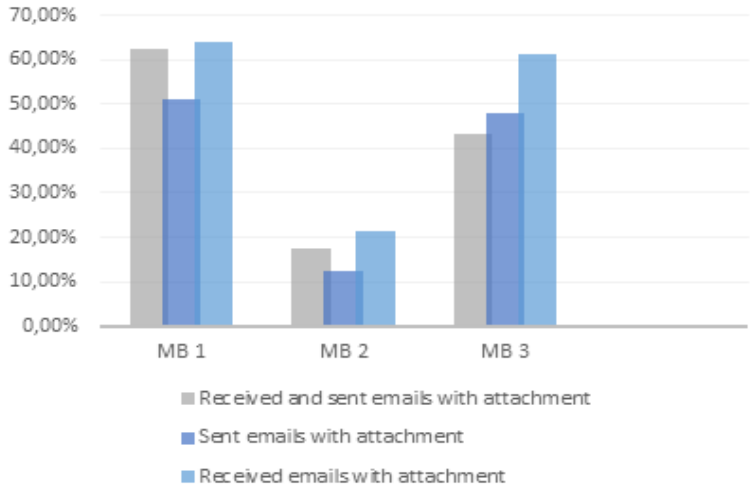

Figure 11: Attachments included in the emails

5. Findings

This chapter analyses the Pre-analysis with the Theoretical framework. The chapter is divided into three parts. Part one addresses RQ1: What are the effects of using email as a communication tool and channel?, part two addresses RQ2: What are the different communication tools and channels applicable for businesses?, last part addresses RQ3: What are the communications alternatives to overcome the potential implications of using email?

5.1 RQ1: What are the effects of using email as a communication tool and channel?

According to Dürscheid et al. (2013), email is a well-known and understood communication tool and therefore seen as the most popular. Further, email is a good tool for sharing information, sending invitations or other data (Dürscheid et al., 2013). This correlates how TOE utilizes email as they send and receive several types of message through email, see table 5 under 4.1.2 Interviews with operational workers. A benefit mentioned by TOE is that all emails are received in written form, and therefore one can follow up on any issues and tasks whenever it is needed. However, a problem stated was that emails get deleted to maintain a clean mailbox. Furthermore, the pre-analysis showed that the employees, on average, were spending almost half of their working day in the mailbox. This is in accordance with what Dürscheid et al. (2013) and Pignata et al. (2015) stated; that the usage of email within business has reached high grounds and takes up many working hours.

Dürscheid et al. (2013) and Giacoletto and Aberer (2005) also state that email enables users to send and forward the same information to many people at once. It was found from the pre-analysis that TOE thought that email was a good tool to contact several persons and departments at once and by that sharing necessary information in an efficient way. According to Havets et al. (2019), to easily forward an email or send it to many people can enhance an organization's transparency. Further, the authors also state that this can be seen as a drawback as the employees can feel monitored and controlled by others (ibid.). However, employees at TOE did not feel this way. Found from the pre-analysis, one of the biggest problems when communicating through email is the large amount of received emails and information in the mailboxes. The three mailboxes analysed received and sent an average of 54-257 emails per day, depending on the mailbox. However, it was also found from pre-analysis that the mailboxes received between 17-34% emails from an internal domain. Further, almost half of the received internal emails in one of the mailboxes were from one specific email address, and one of the mailboxes received many emails from their own mailbox. Further, the employees at TOE stated that some incoming emails are sent to several addresses. Between 25% and 50% of the received emails in the three analysed mailboxes include other email addresses in CC. This means that they either need to read and handle the same emails several times or read and handle emails that are not even concerning them. Haesevoets et al. (2019) emphasize that organisations use the CC feature to increase transparency. Kilpeläinen and Tyrväinen (2004) state that communicating in digital form increases the risk to distribute information to too many people and, in some cases, not to the right people. Whittaker and Snider (1996) state that email increases the possibility of feeling overloaded as it has multiple purposes. A result of distributing too much information is that the communication will increase without adding more knowledge to the employees, it will rather add more work (Kilpeläinen & Tyrväinen 2004). Also, Pignata et al. (2015) state that communicating through email can create too much work associated with monitoring the mailbox but also disrupt other work tasks. This issue is seen at TOE as they put much effort and extra work into keeping control over the mailboxes and all incoming emails. Employees at

TOE feel that their way of working is inefficient due to all the monitoring and that other tasks get affected. The pre-analysis showed that all departments sorted their emails into different folders, and most of the participants also used categorisation and follow-up flags. However, Watt (2009) states that the logic behind labeling can be challenging for others to understand as people often use words that are within the source or from their social references. Therefore, it can be challenging for employees to navigate in the mailboxes as they do not use the same structure due to having no standard way of using and labeling folders and categories within the departments. A result of this is even if the information is accessible, it can still be challenging for an employee to backup or support a colleague. Some departments also use priority plans and rules to make sure that emails get handled in time. Almost one-third of the participants also filled in everything they did in an excel sheet to have control of all the email, information, and tasks.

However, despite these actions taken, mistakes are made. Emails get wrongly marked and sorted, and on some occasions, important emails get deleted. A result of this is that emails are handled too late, or in some cases, they even get overlooked, which can cause big consequences. This issue with email overload is also stated by Whittaker and Sidner (1996). Edmunds and Morris (2000) argue that employees' health can be affected negatively by creating stress and that making more errors increases by receiving too much information. The mistakes and errors done by employees at TOE can therefore be seen as a result of overly distributed information due to manual handling. It was also found in the pre-analysis that employees in both personal mailboxes and shared mailboxes felt stressed. However, a consequence of these mistakes is that important and necessary email and information do not reach the intended receiver in time or ever. Gorla et al. (2010) state that the timeliness of information is important as the information may not fulfill the needs of the end-users if it is delivered too late and by that creating satisfaction. Moreover, Mohr and Sohi (1995) argue that poor decisions are often made due to lack of information. Eisenhardt (1989) also states that business in a high-velocity market requires employees to make fast decisions. This can be hard if there is a lack of information. Hoeven et al. (2019) argue that it is crucial to find the right level of transparency and the right amount of visible information to make the organisation work more efficiently.

As stated above, both literature and the pre-analysis show that too much information and email is overwhelming. The pre-analysis also found that working in too many mailboxes is also overwhelming. By that, the risk for information overflow will increase if working in many mailboxes.

Gorla et al. (2010) state that one of the quality factors is the timeliness of the information and further the importance of information to be delivered in the right time frame. Employees at TOE argued that good quality in email communication is when people send to the correct mailbox and respond quickly. However, TOE experiences people sending emails to the wrong mailbox. This shows that the timeliness level of their communication with other parties can be increased. Further, it decreases the possibility of getting fast responses without having good accuracy when communicating.

Email content

However, Traxler and Grensberch (1992) state that it is more likely to deliver a failed message in written form than in verbal form as the sender and receiver cannot collaborate and interact with each other to the same extent. However, a benefit with email mentioned by Dürscheid et al. (2013) is that the sender can think through what and how to write the email but also that the receiver does not need to be available exactly when the email is sent. The pre-analysis also found that all emails can easily be saved, and therefore one can follow up on any issues and tasks whenever is needed.

Wiener & Mehrabian (1968) and Rayudu (2009) emphasize that the use of words can affect understanding. As TOE employees stated that good quality in email is by using a subject correlating to the text and that the text consists of correct spelling. However, TOE experiences inadequate subject, body, and spelling when communicating through email. This can be because the person encoding the email may not consider that the words used in the text or subject affect the receiver's understanding of the email. Further, the receiver may not understand what content the body of an emails has by only reading the subject, if the words used in the subject are not correlated with the text. Shrivastava (2012) mentions that failed communication can be due to barriers, and one of these berries is language. Employees of TOE stated that using the right language is important in words but also in using the right language regarding data and abbreviations. However, employees stated that they had experienced the opposite, that different companies and departments see different numbers and information as important. Volvo also perceives some issues with poor quality regarding the text as they communicate with people from different countries with different native languages. These barriers need to be considered when communicating, as Shrivastava (2012) states that the barriers will magnify if there are significant differences between the people communicating.

Rayudu (2009) also states that readability increases if the purpose of the message is clear and does not include too many words. This corresponds to the employees at TOE as they deem that questions should not be too open and that the information should be easily described to understand the content. Traxler and Gernsbacher (1992) state that communication may be unsuccessful if the sender encodes the message in a poor way, receiver fails to decode the message or if it is not a suitable channel. According to employees at TOE, they use phone calls on occasions where further clarification of a message is needed. TOE employees also emphasized that by summarizing the information and including visualizations increases the clarity level and better quality and by that eliminating long emails and long email threads. Although found from the pre-analysis, TOE experiences many long email threads, and few use visualizations when communicating. This can also be seen from mailbox statistics, by including attachment in an email the amount of emails in a thread will decrease with 47%. Further, attachment had no effects on the total amount of letters within each email. The pre-analysis showed that 2 of 3 mailboxes received and sent emails where between 40-60% included attachments; meanwhile, 15% of the emails in the third included attachment. However, one needs to consider that visualizations such as pictures, print screens, and highlights are not included. A drawback with Microsoft Outlook, found through the pre-analysis, was that there is a size limitation when it comes to attached files, and therefore it is sometimes necessary to send several emails. Also, according to Gorla et al. (2010), incorrect information can be due to errors in systems or that new requirements have not been considered. This can also be the reason that TOE receives unclear, unnecessary, irrelevant, and incorrect information.

Liu et al. (2010) argue that having the right knowledge and using the right tone characterize efficient communication. Further, the clarity level of a given message corresponds to the quality of communication (ibid.). Rayudu (2009) also states that clarity, brevity, and completeness determine how effective the writing is. All these statements correspond to what was found in the pre-analysis, that good quality in a text is; clear, concise, having the right tone, including all necessary information. By having the right knowledge, the encoder has a better possibility to encode a message that is clear, concise, and includes all relevant information. Boisot and Canals (2004) argue that two persons can understand the same message differently depending on their contextual background knowledge. According to Shrivastava (2012), this can be seen as a perceptual barrier as they encode and decode them differently. Lunenburg (2010) also states that communication is achieved if the sender and receiver reach a common understanding of the message. TOE experiences that they receive messages of poor quality of information that are long, unclear, incorrect, irrelevant, and lacking. Which do not correspond to

Rayudu (2009) statements of effective writing. This can result in additional messages and, in the end, leads to long email threads. The statistics from the mailboxes showed that the average number of emails in an email thread was 14 emails. This issue can further be correlated to the fact that the sender and receiver have different contextual background knowledge. Therefore, it is important to be sure to increase common understanding of what the needed information is, to decrease the amount of emails in an email thread.

Mailbox types

It was found from the pre-analysis that the main issue with using a personal mailbox is the limited access of information and therefore lack of traceability and visibility of information and operational process. Hoeven et al. (2019) state that it is important to have the right level of transparency and the right amount of visible information to make the organisation work more efficiently. Therefore, a personal mailbox is more suitable when the department or team consists of few employees and where less urgent issues arise. The reason for this is that there will not be too many receivers within the department to contact, and there will be no significant consequences if the mailbox is not constantly monitored or information accessible at all times. However, it was found in the pre-analysis that a benefit with personal mailboxes is the closed-loop between two or more people.

The main benefit found from pre-analysis was that a shared mailbox makes the information more accessible and enables employees to in an easy way backup and support colleagues and can consequently use a rotation system. Muller and Gruen (2005) and Babinchak (2017) state that a shared mailbox enables the colleagues to have shared responsibility and access over the same emails. Further, emails will not get stuck in personal mailboxes that are no longer in use (Babinchak, 2017). However, the main issue of using a shared mailbox found in the pre-analysis is the hardship of keeping control over the mailbox and therefore requires a lot of extra work. A shared mailbox is more suitable in a context where the department or team consists of many employees and where more urgent issues need to be handled. This is due to the fact that a shared mailbox will only give the sender one mailbox to send all issues to; consequently, the sender is ensured that it has been delivered to the correct mailbox. This is a benefit with shared mailboxes that Muller and Gruen (2005) also emphasizes. It was also found from the pre-analysis that a reason why to use a shared mailbox is because the emails are sent to a function, and not a single person. The shared mailbox is also always monitored, and therefore urgent emails will be read and handheld away. However, independent of which mailboxes one uses, several mailboxes increase the risk of forgetting one or several mailboxes.

The issues stated in the paragraphs above will be further addressed in the next sections when analysing RQ2 and RQ3.

5.2 RQ2: What are the different communication tools and channels applicable for businesses?

Carr and Kaynak (2007) state that face-to-face contact, written form, email, and phone are traditional ways to communicate, but that the digital era takes advantage of computers. Advanced electronic devices have made the communication between users more efficient and also increased accessibility and storability of the information (ibid.). Bhoi (2017) states that ICT decreases manual handling as well as increases efficiency. Using ICT will also contribute to get access to updated information and to coordinate the work (Acosta-Prado & Tafur-Mendoza, 2021). However, Shrivastava (2012) emphasizes that even though technology increases the communication speed and accessibility, there are still

technological barriers that can affect the communication outcome through errors in the technology. This shows that even though communication tools and channels are increasing in performance, one needs to be aware of the possibility of errors that can affect the delivery of information.

Phone

According to Carr and Kaynak (2007), talking through phones is one of the traditional ways of communicating. Poznańska and Badzińska (2017) emphasize that phone communication allows companies to rapidly answer incoming messages and increase the communication speed. This is in accordance with information found from pre-analysis as they use phones to get answers more quickly. Phone calls are performed at TOE to clarify already sent messages in written form through an email. This can be linked to Buckland (1991), who states that information-as-knowledge is the information given to decrease the uncertainty of already given information. However, when TOE uses phone calls, they cannot store the exchanged information and therefore needs to write it down and send it by email to be able to store it. According to Hoeven et al. (2019), visibility of information is achieved if people have access to it. Therefore, using the phone as a communication tool and channel is good for quick responses but lacks traceability and visibility of the communicated message. Communication through the phone should therefore be used when the information does not need to be stored.

Additionally, Traxler and Gernsbacher (1992) state that verbal communication is more collaborative, as both participants collaborate to reach mutual understanding. Even though the phone is a traditional communication tool, it is still used for fast communication and clarification. This can signify that newer communication tools and channels using written form still lack collaboration possibilities to reach a common understanding.

SMARP

SMARP is an omnichannel platform enabling employees to share and create content through several channels and devices but from one platform (SMARP, 2021b). This is beneficial for organisations as they only need to communicate and store content in one place instead of using several communication platforms. Time spent on switching between several communication tools and channels will therefore decrease or even be eliminated. If it is hard for employees to reach their colleagues, it can affect the business according to Rai and Rai (2008). SMARP makes it easier for employees to reach each other and decreases the possibility that the organisations get affected by not being able to deliver messages. Further, the platform enables the usage of both computer and phone, which increases the user's possibility of being available for communication (ibid.). Users can create content and share at a fast pace with the right audience through SMARPs Publishing Studio (SMARP, 2021b). Kilpeläinen and Tyrväinen (2004) state that information overflow can occur because of high availability, and information is easily spread. Therefore, there is a risk that information overflow occurs because of SMARP's high speed and availability of communication and due to having all information in one place.

Ticket system

The benchmarking company uses a ticket system to handle internal and external communication. They have predetermined tickets that the users can choose between. This is similar to the ticket system presented by Gohil and Kumar (2019), who describe it as a cloud-based tool enabling the users to search for predetermined solutions by putting in query questions in the system. When there is no predetermined solution for a question, then the request is forwarded to a support team to handle (ibid.). The benchmarking company has general tickets for requests without predetermined solutions. If the user has given enough information, then the system can automatically locate where the general ticket should be

sent to. If not, the benchmarking company's support team needs to locate where the ticket should be delivered. When the user has sent the request, the benchmarking company's ticket system delivers it to the right employee in charge of that task, and this increases their answer and solving rate for the tickets. Their ticket system can, for some simple and recurrent tickets, be able to solve and answer them automatically and does not need any human interaction. The benchmarking company emphasizes that manual sorting of tickets and tasks is time-consuming, and the ticket system enables an automated solution for this. According to Rai and Rai (2008), organisations should document the information, distribute the information to the persons it is concerning and store it for future usage. The ticket system distributes and stores the information automatically and therefore decreases the workload related to these actions and enables the organisation to put more effort into solving the issues.

The benchmarking company has a preset of predetermined tickets to make sure that the user fills in all necessary information, so their team can take action on the ticket. They emphasize that this erases the need to ask for additional information and therefore decreases unnecessary communication and long communication threads. Rayudu (2009) states that clarity, brevity, and completeness are factors that increase writing efficiency. The predetermined ticket achieves higher clarity, brevity, and completeness as the required fields are adjusted after the topic and show what information that is necessary to include and by that the message will be structured, include only necessary information but still ensure that all required information is included. Further, Rayudu (2009) mentions conciseness as a factor for effective writing. The message in a ticket system can be deemed as concise because a word limit can be set for each required field. However, Rayudu (2009) mentions accuracy and readability as a factor for effective writing. A ticket system cannot make sure that these factors get fulfilled as it depends on how the person creating the ticket writes. Jakubiec (2019) states the importance of using graphical tools and pictures to make the information easier to understand instead of only using written words. The benchmarking company can require the user to add pictures as the ticket system allows the company to shape the tickets as they like. A result of this is that they can increase the possibility that the information is easier to grasp.

According to the benchmarking company, a ticket system allows the company to follow each ticket through the process and show its status and urgency level. They emphasize that this makes the information easy to trace and that tickets never go missing. The benchmarking company can evaluate and analyse the data to improve their ticket system as they store, have access, and visualize all the data. When a ticket is handled, it is marked as solved and is stored in the system, and they never delete tickets. Rai and Rai (2008) emphasize that it is important for an organisation to store information for the future. Jakubiec (2019) emphasizes that efficient internal communication utilises the information system. The ticket system allows team members to follow each ticket and consequently analyse and improve the system, and the internal communication improves in terms of data and knowledge of the system.

According to the benchmarking company, they can choose which people that will receive and handle specific tickets. They can also choose which people that can only see the tickets for information retrieval. The benchmarking company sends automated feedback to the user to show the status of the ticket and where the ticket is in the process. Hoeven et al. (2019) state that organisations want to be more transparent, which is achieved by making the information more visible. Further, it is important to have the right level of transparency and the right amount of visible information to make the organisation work more efficiently (ibid.). Additionally, Kilpeläinen and Tyrväinen (2004) state that information overflow can be reached due to high availability to too many and wrong people. The ticket system allows the organisation to decrease information overflow as the information is only accessible for

people it concerns. Further, the ticket system increases visibility throughout the whole process by allowing people to track their tickets.

According to the benchmarking company, there are some limitations to the ticket system. They cannot add too advanced templates for the tickets due to technical restrictions. They stated that some issues/requests are too complicated to create a specific template for, as it is hard to ask in a clear way for all the necessary information. Even though the benchmarking company would be able to create templates for more complex issues, there is no guarantee that the person that wants to send a ticket for that complex issue can understand the template. As Traxler and Gernsbacher (1992) emphasize that communication can be unsuccessful if the receiver cannot decode the message.

As mentioned in the above paragraphs, Phone, SMARP, and Ticket system can be used by organisations to communicate.

5.3 RQ3: What are the communications alternatives to overcome the potential implications of using email?

The main issue with personal mailboxes is the lack of accessible information. According to Hoeven et al. (2019), it is important to have the right level of transparency and the right amount of visible information to make the organisation work more efficiently. A ticket system enables a company to easily decide what tickets that should be visible and accessible for which people. Therefore, one would overcome the main issue found when using a personal mailbox, lack of information, by using a ticket system as a communication tool. Found from pre-analysis, employees stated that it would be a benefit that the ticket system presorts the tickets to the right person.

The main issue with shared mailboxes was the hardship of keeping control over the emails and information. This issue can be overcomed by using a ticket system as it automatically sorts the tickets to the right persons and shows the status and urgency level of the tickets. The result of this is that the control over messages and information will increase as people will receive less email and information. Additionally, one will overcome the issues with information overflow and email overload, which according to Kilpeläinen and Tyrväinen (2004), Edmunds and Morris (2000), and Whittaker and Sidner (1996), occur when communicating through emails as a communication. Therefore, a ticket system utilizes that the information is in digital form and by that spreads information more efficiently but at the same time minimizes the risk of overly distributing the information. Employees at TOE emphasize that a benefit with ticket systems is that the quality of prioritization will increase and that the tickets will be visualized and stored in a clear way. A ticket system will also eliminate mistakes that can appear due to manual handling in a mailbox, such as wrongly sorting, marking, and prioritizing.

Communicating through email entails more manual handling, and by that, a main issue found was that everyone had their own structure to handle the email and mailboxes. By using a ticket system, one will work more standardised as it has a higher level of automatization. This corresponds to what is found from pre-analysis, as employees argued that a ticket system enables teams to work in a more standardised way.

It is easier to backup and support colleagues when using a ticket system due to the fact that one can determine who the information should be accessible for. Further, it increases a standardised way of working, and by that, it is easier for everyone to acquaint oneself with the different work tasks and processes.

Another issue found when communicating through email is that the email often lacks information in order to give a proper answer or take action. Additionally, it is hard to achieve effective writing when communicating through email. This issue can be overcomed by using a ticket system as it enables the organisation to force the user who creates the ticket to fill in the required fields necessary for a certain type of ticket. Found from pre-analysis, employees at TOE stated that a ticket system would increase incoming quality as all necessary information is already asked for in the ticket. This is in accordance with the result of the analysis of the ticket system as it was found that the ticket system increases clearness, conciseness, completeness, and brevity, which Rayudu (2009) mentioned as factors that affect effective writing. Additionally, visualizations can be required to be added and by that increase clarity of a message, which according to Jakubiec (2019) increases the possibility to understand the information and improves the communication.

A benefit with the ticket system is that all tickets are stored, and that enables the company to follow the information throughout the process and gives the possibility to analyse its data. Which Rai and Rai (2008) state that an organisation should do. Additionally, Hoeven et al. (2019) emphasize that visible data makes the organization more open. However, the pre-analysis also found that a ticket system is mainly suitable for more frequently performed tasks and not for special cases. This is also emphasized in the analysis of the ticket system.

Therefore, by all statements mentioned above, using a Ticket System as a communication tool would overcome the issues found by using email as a communication tool.

6. Conclusion & Future work

The purpose of the study will be addressed in this chapter by answering each of the RQ. The chapter is followed by a paragraph of proposed future work.

The purpose of the study was to analyse the usage of electronic mail and identify potential improvements by using other communication tools and channels. To achieve the study's purpose, three RQs needed to be answered; effects of using email, communications tools and channels applicable for businesses, and how to overcome the potential implications of using email. Interviews, focus groups, benchmarking, and analysing data from mailboxes were the methods used to collect data.

The authors investigated the two types of mailboxes, personal and shared mailboxes, to find the effects of using email. The effects found were that personal mailboxes gave good control over the mailbox but decreased the visibility, traceability, and accessibility of information and made it hard to backup and support colleagues. Effects found from shared mailboxes were that the information was accessible but consequently harder to control. Both types of mailboxes increased the possibility of information overflow and email overload. However, it was seen that using email was time-consuming independent of which mailbox type that was used. Email also required a large set of manual handled activities and extra tasks, which increased errors, mistakes, and variation.

The study found that several tools and channels were applicable to communicate through. For instance, phone, SMARP, and ticket systems were applicable communication tools and channels. It was found that the phone was beneficial for fast communication and clarification of messages but lacked regarding storage possibilities. SMARP was beneficial as the information available was visible on one platform and several devices. The tool also enabled fast communication but showed a risk of reaching information overflow. The ticket system is great for more visible, traceable, and automated communication.

Moreover, only the ticket system was shown to overcome the implications of using email. The findings were that the ticket system could decrease the human impact as the communication was more automatized. Further, it was found that a ticket system could potentially decrease unnecessary communication and the risk of information overflow and email overload as it directs the tickets to the correct departments and persons. The ticket system enables users to have increased accessibility, visibility, and traceability of the information. Findings showed that the ticket system increased the quality of the content in each message. It was also found that a ticket system enables users to analyse and evaluate its process to continuously improve its performance and communication abilities. Due to the statements above, a ticket system can increase control over the communication and messages.

However, email is a well-anchored communication tool within business and is used for a vast majority of tasks and therefore hard to make an immediate recommendation to replace it with other communication tools and channels. Therefore, the authors suggest to further evaluate the suitability of a ticket system when considering other factors such as economic perspective, technical details, requirements needed, the implementation process, and practical aspects.

7. Discussion

This chapter contains a discussion of valuable topics highlighted or witnessed during the procedure of the research. Firstly, additional information to RQ3 is presented, followed by a reflection on the case company's problem concerning their communication. The last paragraph contains a discussion of the methods performed in the study.

The findings indicated that a ticket system could be a potential improvement to overcome issues found by using email. However, employees at TOE suggested some additional wanted features. They thought it would be beneficial if the different tickets visible for the user to choose between are personalized and adjusted to the users' work responsibility area or department. Further, they would like to be able to contact external parties through the ticket system as well as have a chat function integrated into the system. Additionally, they stated that it would be valuable if a ticket system could integrate with other systems such as transport management systems, SAP, etc.

There is no guarantee that a ticket system can totally replace communication through email, not in the short term at least. The authors still think that email is beneficial to use in a limited way when the information does not have a direct connection with operational tasks and needs to be accessible in the future or by other colleagues.

Phone and SMARP that were analysed in RQ2 would not overcome the potential implications of using email as a communication tool. Similar communication tools and channels are already used within all of the departments. However, there is none or limited visibility, traceability, and accessibility when using these tools and channels. The result of this is that it will be hard to know what has been done, what is agreed, and to backup or support colleagues. However, SMARP could be beneficial to look further into as emails, chat messages, and intranet will then be replaced by this platform. This would decrease the need to utilize several systems and hopefully minimize waste in form of extra work and time spent on switching between different systems. It would also enable companies to analyze their communication performed through the platform.

However, the issues found at the case company cannot only be overcomed by replacing email with a new communication tool. Through the empirical data, pre-analysis, and analysis, the authors have found that some improvements in Microsoft Outlook can be performed to either overcome or mitigate the issues. One could potentially increase the control of the mailboxes by utilizing features included in the communication tool in a more extensive way. The authors suggest using rules to sort frequently incoming emails and templates for frequently sent emails. This could lead to decreased time spent to communicate. A standardised way of monitoring and handling the emails is suggested; everyone should have the same structure regarding the labeling and usage of folders and categorisations as well as follow up-flags. By this, it can be easier to backup and support colleagues but also minimize that emails get overlooked. Further, developing a prioritization guideline for each department is suggested to minimize that emails are seen and handled too late. This can increase further communication, operational tasks, and other consequences within the supply chain. However, employees from the case company would like to be more educated on how to utilize Microsoft Outlook to be able to work more efficiently. Therefore, the authors suggest including this when the employees start working at a company.

Further, the analysis showed that there are benefits with using both personal and shared mailboxes. What type of mailbox that is most suitable depends on the company's' and their departments' objectives and context. The main issue with information and email overload, as well as lack of control, are decreased by using a personal mailbox if it is used in the right context. A context where the users work

in silos and have clear responsibility areas and working tasks so that there is no deceptiveness for the sender to know what types of emails that should be sent to the personal mailbox. Further, the user should not have any tasks that can require urgent actions as there is a lack of visibility and traceability of the tasks performed as well as sent and received emails. Therefore, a personal mailbox should be used if the main objective is to keep control over the mailbox rather than have accessible information and quick responses to incoming emails. The main issue with lack of accessible, visible, and traceable information can be overcomed by using a shared mailbox if it is monitored and handled in a suitable way. By that, there should be standardised ways to handle all incoming and outgoing emails to keep control and make sure that the information can be found. The integrated features in Microsoft Outlook should also be utilized to a great extent. By taking these actions, one can decrease the risk of information and email overload as well as errors, mistakes, and variations but still achieve high accessibility, visibility, and traceability of information. Therefore, the main objective for using shared mailboxes is to have accessible, visible, and traceable information. However, there could have been new routines put into play regarding the company's work because of Covid-19 and, therefore, affects the usage of email.

However, it was clear that the employees at TOE had preconceptions of working in other ways or other communications tools and channels without having the experience of it. The result of this was that almost everyone said that they could never work in a different way than they did.

Further, it is likely that new communications tools and channels will soon be introduced in the business market because of the rapid development of ICT and companies' desire to minimize communication through email due to the many issues raised.

As each department has different tasks to pursue, communication is consequently affected. It was found that TOE utilizes several different information systems; SharePoint, SAP, transport management systems, document management systems, etc. The employees needed to transfer information back and forwards between all these different systems, which was time-consuming. Further, the pre-analysis of mailbox statistics showed that a person, on average, receives 21,5 emails per day and sends 8,5 emails per day. Therefore, it can be of interest to investigate the activities the email is dependent on to see if TOE's problems lie within their communication or that the activities associated with the email messages are the most time-consuming.

Methodology discussion

The study investigated how TOE handles their email communication. However, an interesting aspect not considered is how the receivers of emails sent by TOE perceive their communication quality. This is an important aspect as communication involves two parties, and that communication can be perceived in various ways depending on whom one asks. This was not feasible in the study due to limited time study as TOE communicates with a large set of companies and people.

Due to the extensive collection of data from the five departments, less time was available to pursue more benchmarking. A more comprehensive benchmarking would probably contribute to finding more optional tools and channels to communicate through. Furthermore, it would be beneficial to benchmark a company using an omnichannel communication solution as it could replace several systems into one.

The analysis of the mailbox statistics could have been further investigated, but due to the fact that personal mailboxes also consist of private information it was not feasible. Further, choosing other specific mailboxes would generate different outcomes, as some shared mailboxes are only meant to be for storing information and not for additional communication.

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Appendix A - Interview questions for department managers

Team

1. What is the purpose of the team?
2. What are the main tasks?
    a. Is the task divided between smaller teams or groups?

Functional Mailboxes

3. How many shared mailboxes do you use within the department?
    a. Does all of the teams/people within the department use all functional mailboxes?
        i. If not: which people are using for the functional mailboxes?
4. How do you use the shared mailboxes?
    a. What is the purpose with it?
    b. Do the employees have “private” emails that they are using for the operations as well?
    c. How do you have control over the emails?
        i. How are the emails sorted?
    d. What activities are handled within the shared mailboxes?
        i. What should the response rate be for each task/activity?
        ii. Are there any activities/tasks that are usually postponed?
    e. How much time is set for using the shared mailboxes?
5. What are the benefits and possibilities with using shared mailboxes?
6. What are the drawbacks and challenges with using shared mailboxes?
7. Are there any other communication tools/methods used?
8. How do you measure quality within shared mailbox usage?
    a. Do the emails contain all necessary information that is needed to give a proper answer, receive a proper answer, or take action?
    b. Do you receive/send unnecessary emails?
        i. Emails with questions that the sender can find in for example other systems
        ii. Emails with information that is not concerning the receiver?
    c. Does it happen that emails are overlooked?
    d. How would you describe an email with bad quality and good quality?
9. Has your department always used X shared mailboxes?
    a. if not: Why did you increase/decrease the number of mailboxes?

Appendix B - Interview with operational workers

Introduction

1. Can you describe your position and the responsibilities?

2. What are your major tasks?

Shared and personal mailboxes

3. What shared mailboxes do you use in your daily work to perform your tasks?

    3.1. What activities are handled within each shared mailbox?

4. How do you use your personal mailboxes in your daily work?

    4.1. Gothenburg: What is the purpose of using personal mailboxes, while others have changed to functional mailboxes?

    4.2. What are the effects of using personal mailboxes in this particular way?

    4.3. Gothenburg: Are there any potential improvements in how you work within the personal mailboxes?

    4.4. How come that you are using two systems (both shared and personal mailboxes)?

5. How does the relationship with the sender/receiver get affected by the current way of working (shared/personal mailboxes)?

6. What would the effects be if you performed the major tasks in the:
    - *Shared mailboxes instead of the personal mailbox?*
    - *Personal mailbox instead of the functional mailboxes?*

How you work in the mailboxes

7. How do you monitor your mail and mailboxes and secure control over them?

    7.1. How do you sort and prioritize your mail?

8. How much time of a day is spent on the shared and personal mailboxes?

9. How do you educate new employees in how they should use the shared mailboxes?

Effectivity, risks and & quality

10. Do you deem this way of working as efficient?
    - Example: Time-consuming tasks, double mails, monitor mailboxes, mail with bad quality, unnecessary mail

11. Does the level of efficiency differ among the responsibility areas and functional mailboxes?

    11.1. If yes: How and why?

12. What do you deem as good quality of communication through mail?

- Example:
    - Subject
    - Concise
    - Intention-focused (Clear purpose/goal with the email)
    - Summarizing
    - Well-organized
    - Visually scannable
    - Clear on action

13. What do you think about the quality of your current email communication?
    - Example: delivers to the right person/mailbox, include all the necessary information, double mail

Changes

14. Has there been any changes in the way you work with the shared mailboxes?

    14.1. What were the effects of the changes?

15. How do you inform your senders/receivers on how they should use the shared versus the personal mailboxes?
    - When to use which mailbox

Benefits & Drawbacks

16. What are the benefits and drawbacks with using shared versus personal mailboxes?

17. What are the risks with using shared mailboxes versus using personal mailboxes?
    - Example: Double mail, mail gets overlooked, lack of information, unnecessary communication (“That would be great” etc.), give out passwords, confusing for the sender/receiver, the work is visible for all coworkers

Improvements & future

18. Are there any potential improvements regarding the usage of the shared mailboxes?
    - Improve efficiency
    - process time, answering time, (receive-reply), follow-up questions, all data needed, structure

19. How would you prefer to work?
    - Suggestion: Using other systems beyond shared mailboxes

Appendix C - Interview questions for Benchmarking

Communication tools used before implementation of Help Center Portal

1. How did the communication flow look like before the implementation of the Help Center Portal?
    a. What communication tools were used before?
    b. What were requirements not fulfilled when using the old communication tools?
    c. What was the driving force to implement the Help Center Portal?
    d. What were the biggest challenges to reaching where you are today?

Implementation of the Help Center Portal

2. What were the effects of the implementation?
    a. Were the necessary requirements fulfilled after the implementation of the Help Center Portal?
    b. Were there any effects regarding customer satisfaction?
    c. Did the workload to handle communication change?
    d. Did the quality of the communication increase (estimated percentage to the better or worse)?
        i. Right issue/ticket to the right person
        ii. What were quality aspects affected both to the good or bad?
            - Usability
            - Transparency
            - Waiting times
            - Understandability
            - Traceability
            - Automation level
            - Manual handling level
3. What would your recommendations be for other companies trying to achieve similar automation changes?

After the implementation

4. How is the Help Center Portal used?

5. How do you monitor the Help Center Portal?
    a. Do all employees constantly monitor it, or do they get notifications?
    b. If they receive notifications, how is it sent out?
    c. Do you have automatic replies to the incoming tickets?
    d. Is it a person who sorts out all tickets to the correct department/person or is this automatically done?
    <u>If it is automatically done:</u>
        i. How does the sorting process work?
        ii. What are the margins? How well does the sorting process perform?
    e. Is there any sequence of events that contributes to inaccuracies? Such as tickets getting sorted to the wrong person/department.

6. What tools are integrated into the Help Center Portal?

7. What does the Help Center Portal offer for other companies?

8. How many customers are using their own ticketing system to communicate with your Help Center Portal?

9. Is all communication both internally and externally handled in the Help Center Portal?
   <u>If not:</u>
   a. What other communication tools do you use?
   b. How many users are using the Help Center Portal?

10. Did the Help Center Portal create new requirements?

11. Are there any boundaries to what the portal can offer?

12. Did any new problems/issues arise when using Help Center Portal as a communication tool?

13. Are there issues with double tickets?

Email communication

14. How much did you communicate through email before the implementation of the Help Center Portal?
    a. Did you use only personal mailboxes or functional mailboxes to?
    b. What were the effects of using email as a communication tool?

15. How much do you communicate through email today?
    a. Do you use only personal mailboxes or functional mailboxes to?
    b. What are the effects of using email as a communication tool?

16. Is the Help Center Portal connected to the email?
    a. Do you get notifications to your email when there is a ticket that concerns you?
    b. Can you answer a ticket through email?

Appendix D - Scenario used in focus group session 3

Company X is using a ticket system as a communication tool. All communication goes through the ticket system and a communication thread is initiated by a request being raised through either email or a portal.

The frontpage of the portal enables the user to search for their theme/issue, choosing the subject that mimics the user's theme/issue the best. The user is then forwarded to an adapted form based on the chosen subject where one needs to further fill in specific details. When all the required boxes are filled out a ticket will be created and forwarded automatically to its corresponding department to be handled.

The ticketing system has an email mailbox at its core, enabling the users to also send emails to a Support mailbox. These emails will still produce tickets the same way as the portal, to enable the user to have the same visibility of its request as the portal offers. A ticket can also be answered through either email or the portal.

All requests, both internal and external, can be seen in the portal in form of a list. It can be sorted by created by, subject, theme/issue, and status. In addition, the user will have access to detailed information and history of each ticket. Some recurrent requests are answered automatically while others are handled manually.

The ticket system enables the company to easily analyze all tickets. The tickets can be analyzed based on a specific user, company, subject, category etc. One can see the number of issues created as well as total/average effort used to solve the tickets. The visibility and transparency enhance Company X possibility to improve their communication with both internal and external users as they can investigate the communication flow in more detail.

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CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2021
www.chalmers.se

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