“SINCE THE BEGINNING OF THIS INTERVIEW I HAVE MANAGED FOUR EMAILS”

A qualitative study of email management for information workers

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Abstract

As a result of the rapid development of technology and the implementation of it in work environments, productivity and profit can increase for an organization. Email has led to much shorter ways of communication but there are also less positive aspects of technology. Technostress, information overload and email overload are all three effects of this new ubiquitous digital era. We ask how individual information workers manage and reply to incoming email, to extend our knowledge regarding the effects of email overload on information workers, and to identify their coping strategies in their work life context. This knowledge can be used by practitioners, designers and researchers to develop email as a service further. By conducting nine qualitative interviews with information workers employed in three different organization, we found that balance in email management is important to utilize the full potential of the service, and it would be useful for individuals, as well as organizations, to establish clear rules regarding email use both within work hours, as well as on leisure time.

Keywords: Information worker, email management, technostress, information overload, email overload.

1. Introduction

In today's society, it is almost impossible not to interact with some sort of digital medium throughout the day. The digital devices are more or less a ubiquitous part of our lives and are in most cases developed in order to assist us and make our days more efficient (Ayyagari, Grover & Purvis, 2011). The use of technology is mostly helpful for the users, but every coin has two sides. A new term, technostress, was introduced with this increasing use of digital devices. Technostress can be described as an “individuals' inability to effectively deal with information and communication technologies” (Ayyagari, 2012). Stress and mental health issues is also a growing problem connected to ICT transformation of the working environments. ICT has become more ubiquitous than before, which puts greater pressure on the working individual (Arbetsmiljöverket, 2015). As technology keeps evolving, it puts higher expectations on the working individual when it comes to productivity and results (Ayyagari et al., 2011). As an information worker, defined as “a person who uses information to assist in making decisions or taking actions, or a person who creates information that informs the decisions or actions of others.” (Rasmus, 2012), you need to work fast with an ever-growing amount of information, which could lead to information overload (Eppler & Mengis, 2004). Research on information overload has often taken an organizational perspective looking at how email overload affects productivity and stress in the workplace (ibid.).

Information overload can be seen as one of the cornerstones of technostress (Ayyagari, 2012), affecting information workers regardless if they feel or are aware of their overload. Information overload can take many shapes, depending on what kind of digital services or
devices you are exposed to, but the main effect of information overload is that the performance of individuals is harmed (Eppler & Mengis, 2004). One potential medium of information overload that is heavily researched throughout the years is email overload, and the use of email in a working context. Previous research on the topic has found high levels of multitasking, interruptions and email overload to be a common occurrence for information workers (Mark, Voida & Cardello, 2012). The amount of time information workers spend on email can be surprising and is often not reflected upon. A study conducted by Renaud, Ramsay & Hair (2006), show that up to 23% of all working time for an information worker can be related to email management, and 70% of all emails sent is handled or read within the first six seconds from when it first arrived in the inbox of the information worker (Jackson, Dawson & Wilson, 2003). Email was initially perceived as an asynchronous communication tool and email overload was thought to be related to the volume of emails that you receive (Renaud et al., 2006).

As the years went by, a different definition of email overload developed; one that either refers to receiving a large volume of incoming emails, or receiving email with highly varying attributes and content. It is important to find a method for dealing with email that reduces the sensation of overload for the individual information worker, in order to reduce stress and increase productivity (Jerejian, Reid & Rees, 2013).

Earlier research has focused on how email works as a distraction in the workplace and email’s effects on productivity and focus (Mark et al., 2012; Dabbish, Mark & Gonzalez, 2011; Mano & Mesch, 2009; Jerejian et al., 2013; Mark, Czerwinski & Iqbal, 2017), and research focusing on different strategies developed by different individuals in the workplace has revealed three types of strategies. Spring cleaners that try to clean their inbox occasionally, frequent filers that constantly sorts and deletes in their inbox and no-filers that do nothing to their inbox other than reading the mails that has arrived (Whittaker & Sidner, 1996). Most studies focus on identifying and understanding how one sort and categorize their inbox and the factors behind that behavior (Dabbish & Kraut, 2006; Kokkalis et al., 2013; Jerejian et al., 2013; Bellotti, Ducheneaut, Howard & Smith, 2003; Rodden & Leggett, 2010; Yoo, Yang, Lin & Moon, 2009; Mackay, 1988).

However, little to our knowledge is studied about what comes after this sorting is completed. How do people think when they reply to their email and what causes them to act as they do? Previous research tries to find out how people, and information workers in particular, manage email in general - not how they manage different email messages and what is behind their choice of actions. This is of pivotal importance for us to extend our knowledge and understand in what manner information workers manage their email.
1.1 Purpose and research question
The purpose of this study is to extend our knowledge regarding the effects of email overload on information workers, and to identify their coping strategies when it comes to reading, replying and managing the incoming emails in their work life context. Since digital technology is ubiquitous today, and since it could be something that affects productivity and focus in a negative way, it is deemed a necessity to contribute to the field of research in order to fully understand the concept of email overload and what mechanisms that can reduce the impact of the phenomenon. This could also lead to a result useful for practitioners, designers and researchers, that could help them change email management for the better.

With that in mind, our research question is as following:

- How do individual information workers manage and reply to incoming email?

1.2 Disposition
We will in this thesis present five following chapters, where we first present the related research regarding technostress, information overload, email overload and how these concepts can be mitigated in Chapter 2, Related research. Chapter 3, Method, presents the research approach and how we conducted the study for empirical material. We also mention ethical considerations, as well as a critical discussion of our own study to highlight its strengths and weaknesses.

Chapter 4 presents the results of the thematic analysis of the study, where the five themes created in the analysis are presented: Management, Reading and writing email, Distractions, Negative aspects of email and finally reflections and recommendations. The two final chapters, 5 and 6, contains the discussion where we combine our result with the related research and we present our findings, while we conclude the whole thesis under the conclusion section. Our references, the interview guide, as well as a letter sent to the participants before their interviews, can be found in the end of this thesis.

2. Related research
In this chapter, we present the related research included to answer our research question regarding information workers management and replying to incoming email. The research is divided into three major themes identified throughout the processing of the chosen articles. The themes are; Technostress and information overload, email overload and mitigation of technostress and email overload.

2.1 Technostress and information overload
Technostress and stress in the workplace is a large and complicated problem. The field of research we want to contribute to investigate the role email play in this larger issue, as research regarding email usage and stress often finds a positive relationship between them two.

Workplaces has become more digitized and is adopting technology solutions in an increasing rate, since this could assist workers and the organization over all in their working
process and increase productivity. Technology can for assist everything from the creation and the design process of the perfect bottle, how to predict solar eruption events, to revolutionizing how GPS-systems affect what way is recommended to drive in order to arrive at your destination in the shortest possible time (Brynjolfsson & McAfee, 2015). As Brynjolfsson and McAfee (2015) suggest, the second machine age is likely to arrive soon, and will increase the digital development even further than today. The relationship between technology development and productivity is however complicated and does not show a linear increase in productivity (Karr-Wisniewski & Lu. 2010). In some cases, more IT usage in the workplace have led to productivity losses (ibid.). While technology increases the capabilities of the worker, it also makes them more vulnerable as well as it puts greater cognitive load on them (ibid.). The level of stress for the individual has increased and is by some considered to be caused by technology (Arbetsmiljöverket, 2015).

Ayyagari, Grover & Purvis (2011) investigated characteristics of technology such as usefulness, complexity and presenteeism, and their relation to stressors such as role ambiguity, work overload and work home conflict. They found that features of technology can amplify the feeling of work overload. When connectivity is enhanced by new ICT, the speed of work is amplified and so are the expectations on productivity.

Technology can be seen as a source of distractions in the workplace. Many helpful applications used in the workplace use notifications to grab the user’s attention so the new information can be displayed. These applications compete against each other for the user’s attention, while the user has their own goal in mind. Notifications that direct the user’s attention away from what they are currently working on can be viewed as distractions. It’s important to note that not all distractions are unwanted, you don’t want to miss an important phone call or read an email too late, but they still act as distractions. These distractions can cause interruptions in the workflow, lead to a multitasking and more fragmented work which has been shown to be strongly correlated with stress (Mark et al., 2012). It was also found that blocking emails in the workplace led to less multitasking and reduced stress (ibid.), confirming the relationship between email and stress. In similar studies by Mark, Iqbal and Czerwinski (2017; 2018), where they blocked unwanted distractions like notifications from social media, they found employees worked longer stretches of time and kept their focus on a single working task longer. People often interrupt themselves too, most commonly in transitions between tasks and sometimes as often as every 5 minutes to check their phone (Jackson et al., 2002). Interruptions in the workplace also exist in a larger social context and has a ripple effect that extends past the individual being interrupted, affecting the collective workers that might share the same office space or have a meeting (Harr & Kaptelinin, 2007).

A characteristic of communication technology that is related interruptions and distractions is connectivity. Ayyagari (2012) investigated connectivity as a characteristic, and found it to be strongly related to information overload. In research looking at technology as a source of distraction, effects in workers behavior can be identified, especially when it comes to emails. Email is a tool that enhances connectivity, but can also at the same time cause distractions and self-interruption (Mark et al., 2012; Jackson et al., 2002; Dabbish, Mark & González, 2011; Mark et al., 2017).
2.2 Email overload

Email is an essential tool for the information worker today and even though email platforms have changed since its conception, the service it provides is still very much the same.

Renaud et al. (2006) found that 23% of working time was spent on addressing emails. There was also some evidence that recipients felt some pressure from email. First, respondents felt the need to deal with email as quickly as possible. They agreed with the statement that they liked to deal with email as soon as possible. It took on average 44 seconds to 1 minute to reply to emails, 70% of users reacted to an email within 6 seconds, it took on average 64 seconds to return to work (ibid.). One theory is that employees find it satisfying to reply to emails, because it feels productive (ibid.). Email response times and the way people feel about email is close to how people handle communication such as SMS, becoming more synchronous in nature. Perceived expectations of a quick response times may be a cause of stress (ibid.).

Traditional mail is an example of communication that is asynchronous, it is known by both parties that it takes time before a response is made. Synchronous communication on the other hand is when communication is established in real time, through a telephone call or meeting in person. Communication tools exist somewhere on a spectrum between these two, where email is often seen as being on the asynchronous side of the spectrum. Email is at its’ roots an asynchronous communication tool, but has grown into a multi-purpose information and management tool. Email is also thought to be one of the major causes of technostress (Ayyagari, 2012), which has worsened with the use of smartphones, since they allow the worker to be notified and look at their email inbox whenever and wherever they are (Pielot & Church, 2014).

Email overload is a phenomenon where a user receives a large volume of incoming email and complicated tasks that they struggle to keep up with, and is seen as a common problem for information workers (Jerejian et al., 2013). There are multiple definitions of email overload, with the first and simplest being an email volume that exceeds what the user is capable of handling (Whittaker & Sidner, 1996). As the years went by, other definitions have been developed and it was later defined as something related to using email as a task managing tool that extends beyond the capabilities of what email can provide (Fischer, Brush, Gleave & Smith, 2006). Dabbish & Kraut (2006) take another approach and define email overload as when a user perceives that their email has gotten out of control. Investigating the user’s perception of their own email as a measurement of email overload, asking them if they sometimes miss information and if they feel overwhelmed by email. The first two definitions suggest that email overload is unavoidable once a certain threshold has been reached, while Dabbish & Krauts (2006) definition leave room for successful strategies in handling email. This is the definition we had in mind when creating our interview guide and when we analyzed our empirical data.

Email overload is however closely related to how many emails the user receives. Barley, Meyerson & Grodal (2011) found that participants that received more email also worked for longer period of time. They were also spending more of their working hours handling email, and email volume has been shown to be significant predictor of stress (Jerejian et al., 2013).
A majority of the studies we have found have looked at what strategies users apply to handle received emails, sorting them and labeling them. Whittaker and Sidner (1996) were one of the first to investigate email overload and found that workers have problems sorting their inbox and keeping up with the volume of email that they receive, which leads to a feeling of email overload. Studies have replicated this finding in recent years, showing that it is not simply a question of better technology and that email overload is still an existing problem (Grevet, Cho, Kumar & Gilbert 2014; Fisher et al., 2006). A sorting strategy may be necessary for some to be in control, but it requires constant maintenance and puts a burden on the user that contributes to the stress that email causes (Dabbish & Kraut 2006).

Research has identified a few different user groups in terms of sorting systems; users who frequently file their inbox into different folders, people who sort their inbox when they feel it has gotten out of control and people who don’t sort their inbox at all. However, the success of these strategies depends on the individual and their circumstances (Mano & Mesch, 2009).

A large hierarchy of folders puts a strain on the user when they receive a large volume of email, which in turn strains the system of folders that the user utilize. When the user fails to maintain their system, as well as keeping up with the email volume, it breaks down (Jerejian et al., 2013). This partly explains why time spent managing your email does not lower stress related to email (ibid.).

Another aspect of email overload is the connectivity that email enhances. Email is monitored by the information worker from a few times a day to an almost constant monitoring (Mark et al., 2012). In a study done by Pielot & Church (2014) social pressure in communication was reported to be a reason why some workers read and reply to emails as quick as possible. One example of such pressure is fear of falling behind and not being up to date with current information. This could lead to a high information demand on the worker (Barley et al., 2011). It is recognized that email can cause stress and reduce productivity and businesses and researchers have identified what aspects that can be improved and have developed different solutions that try to tackle the problem of email overload.

2.3 Mitigation of technostress and email overload

There is also research focusing on how email overload and technostress can be mitigated. Different approaches to this problem are established; from a technological point of view, a better designed email interface could reduce email overload. Other propose that organizations should create guidelines and rules for email management that could reduce stress (Srinivas, Faiola & Mark, 2016). Each problem area of email overload has however its own potential solutions.

Part of the problem with email overload is that email distracts individuals from other work, primarily when it notifies the user with sound or another kind of cue. Distractions may be less interruptive during transitions between tasks, and it has been found that people are more positive towards interruptions during physical transitions and real breaks (Ho & Intelle, 2005). This also happens to be the time that information workers tend to interrupt themselves the most (González & Mark, 2004). Creating guidelines for yourself and in the workplace regarding when and where you receive notifications can be helpful as well
(Srinivas et al., 2016; Jackson et al., 2003). Blocking email entirely reduced workplace interruptions but is not a viable solution for many workplaces, and restricting email access to a few times a day might increase stress instead of reducing it (Dabbish & Kraut, 2006).

Email was designed and optimized to act an asynchronous communication tool first and has through its usage evolved into much more. Whittaker and Sidner (1996) identified that email is often used as a task-management tool even though there is limited support for it in the application. Bellotti, Ducheneaut, Howard & Smith (2005) researched the problems with using email as a task-management tool and developed an application that addressed these issues. One of the key features of this application was that all emails could contain meta-information such as deadlines, reminders and actions that would often be written down in a separate application before. Aggregating information concerning a task was another component, allowing the user to connect contacts, emails and actions to a specific task.

Several researchers have pointed out that there is room for technological improvements for email (Renaud et al., 2006; Dabbish & Kraut 2006), and there is a lot of research that suggests different technological solution. One approach is to handle prioritization similarly to how social media such as twitter show personalized information to their users, using algorithms and machine learning that take lexical features, interactions and social network relations into account. These solutions have been tested for email and show promising results that it reduces the sense of email overload and increasing performance (Chen, Chen, Zheng, Jin, Yao & Yu, 2012; Yoo et al., 2009; El-Arini, Veda, Shahaf & Guestrin, 2009). Google tried to tackle email overload creating presets and label categories to make it less time consuming and overwhelming to organize your inbox (Rodden & Leggett, 2010). In order for new technology to be assist in managing email it also has to be adopted by the users. Email has a long history of being used as a tool for communicating crucial information and users are skeptical about adopting new technological solutions for email, fearing that important information will be lost (Barley et al., 2011).

2.4 Summary
The use of technology comes with much positive effects. As the use of it expands, we also need to consider the negative effects it might bring, such as technostress and email overload. The purpose of this study is to extend our knowledge regarding the effects of email overload on information workers, and to identify their coping strategies when it comes to reading, replying and managing the incoming emails in their work life context. Finding answers related to these activities could help practitioners, designers and researchers to understand email as a phenomenon and use that knowledge to feel less stressed and overloaded by provided information, to design more suitable applications or to find new areas to research.

3. Method
In this chapter, we will present our research approach to address our research question, what principles of research ethics that was considered, the choice of the participants and data gathering, data processing as well as a method discussion.
3.1 Research approach

Our study is based upon earlier research regarding technostress, information overload, email overload, as well as data collected through interviews with participants who had experience of email management in an information work position. As our research question aims to answer how information workers manage and reply to incoming email, we chose a qualitative approach since that would generate a result that could explain the phenomenon and be theoretically generalizable and authentic in some way (Mason, 2002). A qualitative interview allowed us to explore a broad range of dimensions of the everyday life of our participants, something that could help us understand their experiences, how that affects them and the significance in their work situation (Mason, 2002; Patton, 2002). The choice of a qualitative approach would help us get a deeper understanding of the selected subject compared to what a quantitative survey would have done, and it would allow us to see the phenomenon out of another person’s perspective (Patton, 2002). Another quality of this method is that it takes the social context of the situation into consideration, and it is executed where the studied phenomenon takes place, which gives the data collection an authentic, yet flexible and sensitive, aspect that a quantitative approach would lack (Mason, 2002). We first conducted a pilot interview to secure the quality of our interview guide and the findings that came out of our questions (ibid.).

We chose to conduct semi structured interviews in combination with a shorter in-situ element. The latter was included in our interview as a trigger and a starting point for their reflection of their email management, as this has been shown to aid participants in correctly recalling their own behavior (Gouveia & Karapanos, 2013; Möller, Kranz, Schmid, Roalter & Diewald, 2013). The participants were asked to open their inbox and look at email with different length and complexity, so that they could give us a true picture of their behavior rather than just their own perception of their behavior.

3.2 Data gathering

In order to find answers to the research question of our choice, we conducted qualitative interviews as stated earlier in the method chapter. This was done in order to broaden our understanding of the selected phenomenon, as well as it was contributed to a, for us, more realistic perception of the selected topic.

As our thesis is focusing on email management for information workers, the narrowing of potential participants in the qualitative interview easy to make, as the focus is on information workers and their email management in general. Two organization conducting information related work was identified and a number of people working there were asked to participate, as well as a third one was contacted in order to execute the pilot interview in the beginning of the data gathering process.

We chose to interview participants with various positions and on three different organizations, so potential sociocultural aspects would have less effect on the empiric material. In one of the two organizations, our ability to reach potential participants was limited, which lead to us being presented a set of participants from our contact in the organization. In the other organization, we had greater opportunities to contact the potential participants ourselves. Our goal was to find participants with different experience of
information work, both when it comes to time working as information worker and their current position.

The data collection started with us conducting an initial pilot interview, to secure the quality of the developed interview guide and its questions. The pilot interview was valuable for the final results, since it allowed us to critically evaluate and scrutinize the initial guide (Mason, 2002) and improve it to the rest of the interviews if any larger flaws was identified. The interview guide was created by considering the related research of the selected phenomenon in combination with the identified research gap and our research question. As we intended to carry through semi structured interviews, we decided to make a guide with four overall themes where we could secure that we focused on some things that we needed to focus on, but at the same time leave room for follow up questions and questions that came to mind during the interviews. The created themes were: Demographic questions, Email management; in-situ reflections and Conclusion.

The demographic questions were there for us to get a simple understanding of who the participants were, asking about age, what position they have and how much experience as an information worker they had. The second theme was partly based on Dabbish & Kraut (2006) related research regarding email overload and how to identify a potentially overloaded person.

The third theme, in-situ reflections was based on their real email inbox and their behavior connected to specific email interactions. At first, this intended to be a more central part of the interviews. We did however change the design slightly, based on the result of the pilot interview. The initial thought was to go through ten of the participants sent emails, which later was changed into asking to look at an email that exemplify different email characteristics such as complexity, simplicity and length instead. The final theme was there to conclude the interview as well as targeting factors as stress and their general attitude towards using email as a tool in their work. The interview guide can be found in Appendix 1.

As the pilot interview and the participant provided answers of satisfactory character, we chose to include the result of the pilot interview in the final results. We were also confident that the rest of the planned interviews would provide us with useful answers with this interview guide as a base, where we later could add follow-up questions of interest throughout the interviews, as the semi structured method allows.

All interview, but the pilot interview, took place in the participant’s office or in a room close to their office. The pilot interview was performed through Skype since we were limited by time and geographic location which lead us to not being able to perform the interview face to face with the participant. All interviews were conducted in Swedish, since it was the first language for both us and the participants. This allowed both the questions and the answers not to be affected by any linguistic limitation.

In order to protect our participant’s anonymity and to fulfill the principles of research ethics, we chose to exclude each participants’ name in this study, and replaced it with Participant 1-9 instead. Their organizations were renamed to Office A-C in order to keep them anonymous as well. The final set of participants consisted of 3 male, and 6 female participants with an average work life experience of 21 years. The average interview was 52 minutes long. See Table 1 below.
<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Information work experience</th>
<th>Workplace</th>
<th>Interview time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>Female</td>
<td>2 years</td>
<td>Office A</td>
<td>42 min</td>
</tr>
<tr>
<td>Participant 2</td>
<td>Female</td>
<td>19 years</td>
<td>Office B</td>
<td>51 min</td>
</tr>
<tr>
<td>Participant 3</td>
<td>Male</td>
<td>33 years</td>
<td>Office B</td>
<td>48 min</td>
</tr>
<tr>
<td>Participant 4</td>
<td>Male</td>
<td>28 years</td>
<td>Office B</td>
<td>76 min</td>
</tr>
<tr>
<td>Participant 5</td>
<td>Male</td>
<td>41 years</td>
<td>Office C</td>
<td>55 min</td>
</tr>
<tr>
<td>Participant 6</td>
<td>Female</td>
<td>30 years</td>
<td>Office C</td>
<td>48 min</td>
</tr>
<tr>
<td>Participant 7</td>
<td>Female</td>
<td>&lt; 2 years</td>
<td>Office C</td>
<td>45 min</td>
</tr>
<tr>
<td>Participant 8</td>
<td>Female</td>
<td>16 years</td>
<td>Office C</td>
<td>48 min</td>
</tr>
<tr>
<td>Participant 9</td>
<td>Female</td>
<td>20 years</td>
<td>Office C</td>
<td>55 min</td>
</tr>
</tbody>
</table>

Table 1. Summary of Participants

3.3 Data processing and analysis

After the final interview was conducted, we started the process of transcribing and analyzing data. The process started off when we listened to the recorded material and wrote it into text word for word. The nine interviews generated a total of 93 pages, which was reduced down to 22 pages of codes.

We chose to conduct a data analysis through open coding that allowed us to thoroughly read through the material, find interesting parts of the text that we later provided a code, something that easily described what the part of the text represented (Fejes & Thornberg 2015). It was deliberately made without any specific theory or theme in mind, since we wanted to make sure that every code was represented the best way possible, without giving us a false understanding of the processed material (ibid.).

The codes from each interview was later placed into categories and themes, where the final result of the thematic analysis is presented in chapter 4 was generated. The empiric material was also translated from Swedish to English, with minor changes in order to make grammatically correct sentences. Examples of the data processing can be found in Table 2 and 3 below.
Table 2. Example 1 of data processing process.

<table>
<thead>
<tr>
<th>Citation</th>
<th>Code</th>
<th>Category</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>I check my mail from home, by curiosity.</td>
<td>Mail from home</td>
<td>Connectivity</td>
<td>Stress</td>
</tr>
<tr>
<td>I replied to big amount on email every Sunday night</td>
<td>Mail Sunday night</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would need more time to feel pleased with my email management</td>
<td>More time</td>
<td>Duration</td>
<td></td>
</tr>
<tr>
<td>It is rare that I have my own time, and when I have, I do not focus on my email.</td>
<td>Lack of time</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Example 2 of data processing process.

<table>
<thead>
<tr>
<th>Citation</th>
<th>Code</th>
<th>Category</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>I deactivate notifications when I go to a meeting or a presentation</td>
<td>Interruption Meeting</td>
<td>Notifications</td>
<td>Distraction</td>
</tr>
<tr>
<td>I do not have any notifications, it is very annoying</td>
<td>Notification emotion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I usually use the email in my phone when I need to find information</td>
<td>Use of phone</td>
<td>Mobile Phone</td>
<td></td>
</tr>
<tr>
<td>I do not have my work-related email on my private phone</td>
<td>Private phone</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.4 Principles of research ethics

In order to assure that the study was ethically conducted, and to secure that the rules of humanistic and social science research were followed. We considered the principles of research ethics established by Vetenskapsrådet (2002).

Vetenskapsrådet (2002) has provided guidelines regarding four requirements; information, consent, confidentiality, usage that we all considered when executing the study and the conducted interviews.

The requirement of information was followed as we before any interview sent a letter to the participant where we informed them that their participation in our study is voluntary, and that they themselves could impact how and in what way the interview would be conducted. We also informed them about who we were, what the purpose of the interview was and what their information would be used for. This document also secured that the participants got informed regarding the consent and the usage requirements. Since we stressed the fact that the interviews were conducted under a voluntary basis, the requirement of consent was confirmed as soon as the interviews started. We also informed the participants in the beginning of each interview that the conditions of the interview were regulated by the participant itself and that they had the freedom to cancel the interview at any given moment. The usage requirement was considered in the creation of the document where we clearly stated in what way the answers given in the interviews would be used for, as
well as we guaranteed that we would not use their data in any other contexts than the ones we earlier stated. The letter send to each participant can be found in Appendix 2.

All recordings of the conducted interview, and the following transcribed material, was handled and stored in a way that followed the rules of the confidentiality requirement. All involved understood the importance of protecting the anonymization of the participants, and therefore all communication and sharing of information related to the interviews was secured to not harm the participants of the study in any possible way.

### 3.5 Method discussion

The following chapter intends to question the research approach through a critical perspective, and both strengths and weaknesses will be discussed.

We felt that the choice of a qualitative method with semi structured interviews fitted our purpose very well, as we wanted to get a general understanding of email management in the information worker population. Therefore, the choice of method aligned with our research question, something Mason (2002) mentioned is profitable. A semi structured interview where we asked the participant how they managed their email, could however lead to a reflection unfavorably far off from the reality, which we tried to prevent by implementing the in-situ element in the interviews. The use of an initial pilot interview was of great value in this case, since it revealed flaws of the in-situ element that we later redesigned in order to work the way we wanted. Since we encouraged the participants to have their email inbox open throughout the interview, we introduced a potential distraction that could affect the answers the participants provided in a negative way. We noticed during some interviews that the arriving email indeed was distracting the participant once in a while, but we are confident that it did not radically affect the quality of the empirical material.

We are pleased with our selection of participants, since they gave us a wide range of answers to the questions we had, but at the same time unison to the degree that we felt that we got material that could represent the larger population of information workers. Our first intention was to find ten participants to interview, but after the eighth interview, we felt that the answers were saturated, which the ninth and final interview confirmed.

We also had the intention to interview participants with more experience of being information workers than two years, in order to secure that their answers would be representative in a large extent because of their experience. However, due to illness, one of the participants on Office C could not attend. The participant that replaced them had less than two years of experience, which contradicted with our initial plan. Subsequently, that was valuable for us since it broadened the picture of represented information worker further.
4. Result
In this chapter, we present the result from our thematic analysis of the empirical material, collected through the semi structured interviews. Each headline represents the themes identified throughout the analysis. These themes are: Management; Read, write and reply; Stress; Distraction; Reflections and recommendations.

4.1 Management
In this theme, we present empirical data that touch upon the management, sorting and prioritizing of email, and when people monitor their inbox. This theme reconnects to our research question as it focuses on the participants email management.

4.1.1 Inbox monitoring
The participants were asked how often they check their inbox and when they do it. When asked when they check their email, all participants answered that they check their inbox in the morning when they first get to work. Most participants also said they check their email around the time of physical breaks from work, for example right after lunch or before a coffee break. A majority of the participants answered that they check their email throughout the day and that it was difficult to answer how often they did it. These participants often had the email application running on their computer constantly and checked their inbox frequently, every time they received a notification or felt like doing so. Two participants said that they check their email at home as well, to plan the coming workday or to catch up with emails they haven’t had time to read. The other participants said that they tried to avoid checking their email outside of working hours.

“I always have it running. The first thing I do when I come here is open the program, and I close it when I go home” - Participant 4

“I am in full control of my email almost all hours of the day. It is actually only when I sleep that I am not in control” - Participant 6

Only one participant answered that they check their inbox only three to five times a day, but they also said that they have the email application running in the background and that it depends on what they are currently focusing on.

4.1.2 Management strategies
The participants were asked about how they handle email today and gave us varied answers. A common theme from all participants was that managing of email starts when they notice it and read the headline of the email and get a first impression. What you then do varies, two participants said they immediately flag or label it if they deem that it has a high priority while another participant tries to reply immediately.

When we asked the participants the general question about how they approached managing their email today we got various answers. All of the participants answered that
when they first check their inbox they scan through their inbox, read the subject, sender and sometimes the content of the email to determine its priority and if they need to reply to it. After this first scan of their inbox, the participants differ in their answers. Some participants try to reply to the emails that they can while others first sort their email before replying to them. This scanning and sorting is most often done by the participants in the morning when first coming to work. A few of the participants had the opposite approach and sorted their inbox before going home. Several participants told us that it is important to mark email you have read, and are planning to reply to later, as unread or label it before going back to work, otherwise you risk forgetting it.

“I flag it depending on the priority, so I can put it away. Then I have my own system where I categorize email into: waiting for a reply, information, emergency, not complete. Then I color code them, mark them and categorize them based on that. The inbox for me contains the email that I am not done with” - Participant 6

4.1.3 Sorting and prioritizing

We asked the participants if they sort their inbox into folders or label them. All participants answered that they have a system and sort their inbox in some manner, but how they sort varies. Most common was sorting email into folders that correspond to a specific task area, for example all email concerning a specific service is sorted into a folder with the name of that service. The ones sorting their inbox in this manner said that they have a large number of folders to keep track of. Another answer was to have folders that correspond to their priority and if the task is complete or not. Participant 3 and 6 answered that they had all emails that required an action in their main inbox, sorting all emails that were completed or did not require a response into their respective folder. Participant 4 said that they do not sort their inbox into folders and instead use the email-clients search functionality together with tags that they mark email with. Most participants stressed the importance of keeping their inbox clean so that they wouldn’t forget to reply to an important email or miss it.

“Yes, that is how it works, my inbox is always small. There is always a response that should be done, it’s like my memory list” - Participant 6

“I try to make sure that I have less than 30 emails in my inbox, otherwise you forget to reply.” - Participant 3

When asked about how much time they spend on sorting their inbox, participants answered that most time spent sorting is removing spam and clearing up their inbox. We also asked them if the system they used worked to their liking. Some participants answered that they sort their inbox at home during breakfast in order to have a clean inbox with only tasks that needs to be done when they get to work and that they delete spam before going to bed. Participant 2 said that they had to abandon their old sorting system because the system had too many folders that became hard to manage when they received a lot of emails.
“There were too many folders, I couldn’t find my stuff. It became easier to let all the emails be in one and the same folder and then search for them instead” - Participant 2

When asked if they delete emails from their inbox, most participants answered that they delete emails in the process of cleaning up their inbox, with the exception of a few participants that said that they try to sort everything. Both Office B and C have a governmental responsibility to save email in case of a possible investigation. When asked what type of email they delete, the most common answer was emails they consider spam and emails that they can see were automatically generated. Some of the participants said they delete old emails that are no longer relevant in order to keep the volume of emails in the total inbox low but that they are careful as to not delete emails that may be important. Two of the participants said that the spam filters they use today are more effective than in the past and that this has saved them a lot of time.

When asked how difficult it is to find the information they seek in their inbox, all participants answered that they do not have any difficulties. The participants who used many folders said that their folder system helped them find the information quickly but searched for it if they could not find it immediately. The most common answer was that they search for the information using keywords instead of looking for it manually.

When asked how they prioritize different email the participants gave us quite similar answers. The participants explained that the sender and the headline were read to determine the emails priority, they then identified what type of email it was. The participants had different ways of describing the types of email they receive depending on their work. Three types that were commonly described was: Email that requires a response, email that contains information that is necessary to read, and emails that relate to a task that they have to perform. The participants highly prioritize the emails that are either easy to reply to or are time sensitive.

When asked if the sender was important to their prioritization of an email, most of the participants replied that it was more important what area of work it was related to rather than what their relationship to the sender is.

“I do not know if it is about the sender as much as the subject, actually. I would rather say that I determine based on its urgency.” - Participant 2

4.2 Reading and writing email

In this theme, we present empirical data connected to when and why email should be used, how long an email should be, what makes an email simple or complex to reply to, when one should expect a reply and unwritten rules that affect how they act. Reading, writing and replying to email is a core part of email management, which connects to our research question.
4.2.1 Email length
When it comes to writing email, all participants expressed that emails should be concise, and if a longer email is needed, you should try to attach a separate file to the email instead:

“[…] I often attach documents to an email, which could be 10 pages long. Customers do not read long email, so you have to be concise.” - Participant 5

Short emails were a consequence of trying to keep the email comprehensible and easy to understand, but there is also a clear time management aspect of it as well. Both Participant 2 and 9 mentioned that short emails is preferred, since it may take too much time to be read more elaborate text.

Three of the participants mention the presence of courtesy phrases in email conversations in the discussion of short emails, and that they thought it to be unnecessary, and that it only made the email more difficult to understand. Participant 2 did not mind them being written in an email, but said that it depends on the context if it is suitable or not.

“I get incredibly, terribly annoyed when someone replies “Hello hello, thank you, chit chat” in a group message, so you have to sort and delete 32 “thank you”. […] I do not want to see it, it steals my time. Get rid of the chit chat.”
- Participant 6

4.2.2 Simple and complex email
What emails are easy or difficult to reply to? All participants agree that short, informative, emails with questions where you have easy access to the answer is the ones you prefer to receive. The view on the more complex emails is on the other hand something that differs between the participants. Participant 1, 2, 6 and 7 stated that the most challenging emails to reply to is the ones where you need to be careful how you write it, especially when the communication is between you and an external contact, not related to your own organization:

“It is difficult to reply when specific terms are used and when you need to express yourself in a certain way, especially when it is an external contact. It takes time to phrase yourself, you read what you wrote several times. You do not send anything without controlling what you wrote.” - Participant 7

The other participants agree that the content of another email, or rather what the content demands of the receiver is what makes it difficult to handle. Participant 8 stated that emails where you get a task given to you, is the ones that is hard to reply to. They put pressure on you to do thing that might not have been planned to do earlier, and that it requires a lot of time for you to engage in that matter. Participant 3 agree and point out that it especially is time consuming when you get a task where you need information from other people too, before you can send your reply.
“[…] It is not the email itself that generates cognitive load, it is the task that the email leads to that does”. - Participant 4

4.2.3 Communication errors

In order to get an understanding of how people read and respond, we asked if it is common for them to get a reply that interferes with their intention. The majority of the participants agree that it is a common problem that people tend to miss parts of an email:

“People are terrible at reading email, especially if you send them a longer email” - Participant 2

Participant 4 mention that it happens that people cannot recall the content of an email, or that they even received it, even though they read it when it arrived. Participant 6 mentioned the same thing, and that a possible cause could be that the email is not structured enough. They and participant 2 both suggest that if you write an email with a clear structure of paragraphs, clear headlines and bullet points all your questions will be answered. Participant 6 also stresses the fact to use line breaks in an email since they have experience of email clients that does not break lines itself depending on the width of the window size. They state that emails like that are impossible to read and that leads to information not being delivered in the most efficient way. Participant 9 has another theory that people read their email too fast, or they are just not interested in answering certain questions, and therefore they simply just ignore to do so.

4.2.4 Benefits with email usage

Why should email be used instead of other tools for communication? Participant 1 explains that a meeting or a phone call usually is used to communicate information from one to another, while the email complement that by clarifying and confirming what have been said, and that it is rare to have a deep conversation over email. Participant 9 agrees, and adds that when something is communicated through email, it is settled and “set in stone”. Participant 3 explains that email is the most important tool of communication, where the biggest benefit is that you have everything documented:

“The greatest advantage of email is to have everything written done. You have documentation, you can save it, you can print it.” - Participant 3

Participant 2 claims that they use the email inbox as a digital memory as well, and that the documentation aspect of email is very helpful in that context. By using email, you get a written documentation on both your questions to someone, their reply back to you and your reply to others. Participant 8 however believes that a face to face conversation with someone is the best way to verify that your point came across, which sometimes can be hard do to through an email:
“I can verify that they understood my intention [through a face to face conversation: authors remark]. I believe that there is a lower risk for misunderstandings. If I write an email, I usually read through it several times before sending it. It takes too much time to make sure that my intention is easy to understand through email conversations.” - Participant 8

4.2.5 Unwritten rules
All represented offices had similar unwritten rules established. Without it being communicated, you have to read and reply to emails quick, because people expect you to do so. Participant 1 mentioned that this is needed for the organization to function, since it happens new things throughout the day that affect everyone. Most of the participants share the same picture, that no one is expected to manage and to reply to received emails after their working hours. Participant 4 describes it as if you receive an email after working hours, no one expect from you to read and reply until the next morning. Participant 5 is however having a different point of view. They suggest that if people in a management position send you emails after work hours, you are expected to reply. On the contrary, they stress the fact that you should not be obligated to do so unless it is part of your work description.

4.2.6 Expectations
When we asked the participants when they expected a reply to their sent emails, the answer was quite different. Most of the participants mentioned that they expected a reply within a day or two before you start to question why someone failed to reply. Participant 6 explained that they do not see the email as a chat function, that a reply to an email can be postponed much longer than for example for a text message. They do not expect people to check their email constantly, since that would be a waste of resources. Participant 9 said that they expected to get a reply within the first week from the day that the email was sent. On the other side of the spectra, participant 5 said:

“If you send an email today, you expect a reply within minutes. Otherwise, you start to browse through the obituaries in the newspaper to see if the person in question has passed away.” - Participant 5

However, they all agreed that is mostly depends on what kind of email it is. Participant 3 said that there are few situations when you need urgent replies, and in those cases, email is a good tool to use:

“[...] It is enough if I get a reply tomorrow or next week. In those cases, email is both more efficient, and you get everything documented as well.”
- Participant 3.

Participant 3 continued and said that they usually send urgent emails in combination with a text message to their phone, to highlight the importance of them replying as soon as possible. Other participants had similar experience, where people had approached them after they received an email, to make sure that they had received it. Participant 8 said:
“[…] it is also up to the one sending the email. If I know that I need an answer on short notice, maybe I should consider contacting the person in another way. If I need quick answers, I usually call them or talk to them in person.” - Participant 8.

Participant 4 and 5 mentioned that you should try to reply to emails as soon as possible when you receive them. Participant 5 suggest that one should reply regardless if one knows what to reply or not, since the sender may be anxious to get a reply or a confirmation that the email was received.

“It does not have to be any long text. Just say that you need five more days to find the answer they are looking for. “It was more difficult than we expected to” … whatever it might be. Feedback is incredibly important. High priority.” - Participant 5

4.3 Distractions

In this theme, we present the results regarding email use in different mediums and how notifications are perceived as a source of distractions based on empirical data. As our research question investigates email management, distractions can be seen as the effect different strategies has on the individual’s ability to maintain focus.

4.3.1 Email medium

All participants interviewed in this study has the work email connected to their work computer, which is the main unit for their email management. On Office A and C, all participants were provided with mobile phones, where they all had the email account synchronized as well. On Office B, no mobile phone was provided. However, Participant 4 was the only one not having the email in their private mobile phone as well:

“I do not have the work-related email on my mobile phone, absolutely not. For two reasons; This is my private phone. If my employer wants me to read my email on my phone, they need to provide me one. Second, I do not want to be interrupted with work related emails in my private life.” - Participant 4

Most participants used the computer to read, sort and to reply to email, while the mobile phones was used more as a medium to only read email and keep themselves updated.

“I use the mobile phone only as a tool for searching information, or as a work tool. I do not reply to any email through my phone.” - Participant 6.

“I only read emails briefly on the phone, I rarely write or send email from the phone. I mostly just read the headline or subject on the phone, and based on that I decide if I need to act instantly or if it can wait.” - Participant 8
Participant 3 agree with Participant 8 and mentions that the mobile phone is only suitable for short replies regarding for example meetings, while longer texts is written on a computer. Participant 7 feel a fear of using the email on the phone, since that could lead to them missing emails in the inbox. Participant 1 uses the mobile phone as a tool to get notice when a new email arrives:

“I always have my phone next to me. When I see a notification on the phone, I go to my computer to reply” - Participant 1

4.3.2 Notifications
When being concentrated on one task, email can work as a distraction that hinders you from doing what you intend to do. Participant 5 and 7 for example, has both deactivated notifications from the email client on the computer, just so they can concentrate and not get distracted by something else moving on the screen, while other participants has notifications activated on the computer, and deactivated on their phones:

“If something constantly rings on the phone, it gets very annoying. [...] it is intruding. Especially email, I get triggered. I have 73 apps on the phone that need to be updated, but I do not care. But as soon as I see a number next to the email icon...” - Participant 2

Participant 7 has notifications activated on the computer, and tries to not be interrupted by them if they try to concentrate on something. Both Participant 3 and 6, that usually always have the email open in the background, closes the email client or deactivates the notifications when they go to a meeting or are expected to present something in front of someone else.

“I think it is annoying of someone forgets to turn the sound of or something, you notice that quite often, that people get a text message or email”.
- Participant 3

Participant 1 agrees, and tries not to check the inbox when they are in a meeting or occupied with something else:

“I do not check my email while I am busy with another task, for example a meeting or in a phone call, but it happens. For example, since the beginning of this interview I have managed four emails.” - Participant 1

Several participants have identified problematic consequences with notifications connected to the email. Participant 7 had for example been to lectures regarding distractions and how attention is affected by them, in order to change their own behavior. Participant 6 also highlight the problematic side of notifications, where they feel that is it frightening how long it takes for someone to concentrate again after being interrupted, and that email and email
notifications is a big part of that in their everyday life. Participant 8 realized that notifications was partly unnecessary for them to have activated:

“A notification rarely gets me to read email instantly. It almost never happens. I do not feel distracted by notifications, but I cannot say that they have ever helped me either.” - Participant 8

Even though they do not blame notifications to be a distraction, they agree that email overall can be distracting throughout their day, but not necessarily the most prominent one. A distraction could just as well be lots of papers or post-its on your desk. Colleagues that stop by your office just to say hi is also a distraction. Participant 2 try to manage with distractions by closing the email, even if it is hard to do so:

“I try to shut at least the sound off, so the phone does not ring. However, I have an attention span like a… I usually jump between tasks. So, when I really need to focus, I shut everything down completely.” - Participant 2

4.4 Negative effects of email management

In this theme we present what causes stress related to email management and how one is affected by having access to the email at home, based on the analyzed empirical data. Stress is interesting to investigate since it has an impact on how email is managed, and might give us insight into successful email management strategies.

4.4.1 Stress

We asked the participants what the negative aspects of email are and more specific follow up questions about stress, do they experience any stress caused by email and what do they think is the cause of it. All participants agreed that email can be a source of stress, but what aspects of email that are stressful, to what extent and why it can be stressful was individual for each participant.

One of the participants told us that it is not email itself that causes stress, but rather the availability of email. They found the availability of email stressful because it means you can access your work email and work from home even if you’re not supposed to. They further explained that the boundary of what work hours is and what is expected can become a bit blurry. Five of the participants talked about the amount of emails being a source of stress. The participants said they experienced this stress when they opened their email client or could see the amount of unread emails on their computer or phone.

“I have removed notifications from my private phone, but I still see that small one or two on the app, and if I see that I check to see if it’s a reply I have been waiting for out of curiosity “ - Participant 1
“If I check them on my phone I usually, even if I do not read them, I usually scroll through my email so there is no small unread mail-thingy next to the email icon, because I think it is stressful, I want most of all that it doesn’t show me anything.” - Participant 2

They explained further that the number of unread emails is stressful because it makes them think about the amount of work that is ahead of them. They said they worked somewhat constantly in order to keep the number of unread emails at a low number or have none at all, and that this reduced their stress. One participant pointed out that spam contributed to this stress because it has to be deleted and sorted out which takes otherwise valuable time. One participant told us that the state of their inbox can sometimes make them feel like they have been wasting their time at work, leading to feeling of disappointment in oneself.

Another aspect of email that some participants found stressful was a sense of urgency and a pressure to respond quickly to email. They said that email is sometimes sent when it is an emergency and a response is needed as quickly as possible, but that this is not always the case.

“As we talked about, these email act as a trigger for me to think “Now you have something to do” but I do not know beforehand how much that is, but I still have the reaction that I now have to do something as quick as possible.”
- Participant 8

4.4.2 Work/life balance
We asked the participants if they read work-related email at home and why they do so. Most participants read email at home, but how often and the reason behind doing so was different for each participant. Participant 1 told us that they read email at home mostly out of curiosity, to see if they had received a reply to something they had sent during working hours. Participant 5 said that they try to avoid checking their email at home because it may cause them to start working and replying to work email at home. They stressed the importance of having an automatic reply to emails they receive during vacation that notify the sender that they will receive a reply at a later date.

Four participants checked their email at home to keep themselves up to date with work information. Two participants had experience of not being able to keep up with email at work and having to catch up with the email at home in order to keep up to date. They were often not able to read and reply to email during work hours because the day had been filled with meetings or some other work task that did not leave them time to manage their email.

“ [...] then all the working hours were spent in meetings or talking with people. I handled a satanly amount of email during Sunday nights instead, I could sit multiple hours.” - Participant 3

It was common for these participants to check their work email during Sunday nights, but not everyone expressed the same stress associated with having to work from home in order
to keep up with their workplace demands. Two participants said that it was common to have last-minute information sent to you before meetings, it could be documents or if the meeting is postponed or not. These emails could often arrive the night before a meeting, so in order to be up to date they often checked their email the nights before a meeting is scheduled.

4.5 Reflections and recommendations
In this final theme, we present the analysis of how the use of email has changed from the beginning of email usage until today, as well as what the participants recommend other to do in order to have a successful strategy of email management.

4.5.1 Email – Then and now
All the participants were asked to reflect upon how the usage of email has changed since they started as information workers until today. The participants agree that casual emails, that were common earlier is about to disappear. Participant 6 explains that earlier someone could for example send a joke on Friday afternoon, something that they think is disappearing in favor of other social medias that are popular today. The most prominent change seemed for all participants to be that emails has become much shorter today than they were before, the amount of actual text has decreased:

“You are more effective today and you write shorter emails, not so many details. I think we use less words, less characters in each email since we have more emails to handle. Every email may be shorter, but that does not mean that less emails are sent.” - Participant 4

The use of email has since it was introduced increased drastically, according to Participant 3 and 4. Participant 2 agree as well as they highlight that email is more than just a tool for conversation today, that it is a memory bank and a place for documentation as much as a place to communicate. Participant 6 and 8 has a different view, and think that the amount of received emails is decreasing and that it is lower today compared to a couple of years ago, and that the reason behind that is that there us many more tools for collaborative work today than before.

4.5.2 Management recommendations
When asked if they had anything to recommend for someone who wanted to manage their emails differently, Participant 6 recommended to turn off notifications, set time aside for managing your email and to plan your day with email management in mind. Participant 4 and 5 recommended to reply to your email as soon as possible, so that you never feel pressured to reply later, and more importantly - reply to an email indifferent if you know the answer or not. It is better to communicate that you received the email instead of just keeping silent while you try to find the answer they were looking for.
5. Discussion

In the following chapter, we discuss the result of the thematic analysis in relation to the related research. The discussion aims to connect the research question and the other part of this thesis together.

The first step of email management starts as soon as you look at the inbox, which is when the user starts prioritizing email and getting an understanding of what email to read and reply to first. Everyone has a system for managing email, some sort their inbox into various folders while some color-code, label or tag email. When sorting into folders, two different strategies were found - having folders for different task areas and having folders for different priorities. Even those who did not sort email into different folders employed a system to manage their email, using labels and color codes to categorize email into different priorities and task-areas. The system they employ is important for the participants as email acts as a to-do list and an extra memory for the user. This shows that email has the broad purpose that extends past just sending and receiving email that Whittaker and Sidner (1996) identified. The search functionality built into the email client is used by the participants to find the information they need. And it is often a go-to method for finding a specific email even for users who use a complex folder system, as this created temporary folders of emails that they need in that very moment. Some rely solely on the search function to find information, using search keywords instead of folders. This is also something that the participants say have improved over time.

Email volume tied to the number and notification that displays how many unread emails the user has is a cause of stress for some, it also acts as a measurement of how the user is keeping up with their email load. For this reason, some participants worked actively to keep the number of unread emails low even if it did not include actually replying or managing the email. Earlier research from Jerejian et al. (2013) shows that email management does not reduce stress, which our findings contradict, as it shows that email management can reduce stress to some capacity. Greater email volume increases stress and the time it takes to sort and manage email and leisure time is sacrificed to keep up with the email volume, confirming earlier research (Barley et al., 2011; Dabbish & Kraut, 2006; Jerejian et al., 2013).

So, what can be done to improve the email experience and reduce the potential negative effects of email use? A finding of ours is that email is seen as a task that is supposed to happen as a parallel activity in relation to all other tasks a participant performs during a workday, rather than being something equal to going to a meeting or processing information in some other way. Could this be because of email still having a reputation of still being only a medium for casual communication, rather than strictly professional, as one of our participants expressed it once had been. Since email today has become a medium for planning and a place to store and find important information, and the need of using courtesy phrases and other social elements in the communication is fading, the action of managing email parallel with the others tasks instead of having it integrated with everything has to be changed.

Karr-Wisniewski & Lu (2010) stated that IT-usage in the workplace puts greater cognitive load on workers, and Ayyagari et al. (2011) also mentioned technology as one of the stressors behind work overload and the work home conflict. As a result, from not considering it being
a real work task and through its ubiquitous nature, email is in many cases managed long after working hours, which could lead to an indistinct line between work and leisure time, which in the long run could lead to stress. Managing emails parallel with other tasks also reconnects to the earlier discussion regarding multitasking and its effect on focus and productivity.

We found that the participants prioritize email based on two factors, how easy it is to reply to the email and the urgency of the email. A possible explanation as to why ease was an important factor might be that simply replying to an email and having one less email to respond to is gratifying, as suggested by Renaud et al. (2006).

We found that email overload and interruptions have affected the workplace and not only the individual, showing that interruptions caused by email have a ripple effect (Harr & Kaptelinin, 2007). The participants had an understanding that their coworkers received a lot of email which they took into account when writing email. Emails written are short and concise and if more information is needed it is attached as a document rather than written in the email. The participants expressed a fear that their email would be put away and forgotten if the email was too long. We also found that notifications were often turned off because it could distract everyone in a meeting and not just the receiver (Ibid.). One participant used this knowledge and sometimes sent text messages instead of emails, which they knew would grab the receivers’ attention even when notifications for email were turned off.

Email does act as a source of distractions for the participants, both on the phone and on the computer. Email notifications in the phone were often disabled because it was distracting to the participant as well as their colleagues although push-notifications without sound and reminders for email still existed for some. It is common to scroll through the inbox and read email on the phone, but writing sorting email is done on the work computer. The email application is often running on the work computer throughout the day, and it was difficult for the participants to recall how often they checked their email because they check it so frequently. This almost constant monitoring of email can according to earlier research, lead to more multitasking and fragmented work (Mark et al., 2012).

Our results show that the participants show signs of email overload. They had trouble managing the amount of email they receive, sometimes not having enough time during work hours to manage their email. They experience that they sometimes miss information and important messages. Even though it rarely happens they work hard to prevent it. How they experience email management varies greatly between the participants, the majority do not have any issue with spending time managing email even though it might take away from their leisure time. While some express that a great deal of stress comes from not being able to keep up with their email, some have a difficult relationship with email where email signifies stress in itself.

Research from Renaud et al. (2006) suggest that email is becoming more synchronous and more influenced by social media and chats, where replies and fast communication is expected to a larger extent than if it still were to be considered an asynchronous tool. Our results contradict that statements, and show that email still is treated as an asynchronous communication tool, and that the participants acknowledge this.
The participants felt pressured to reply within one to three days on average. If they suspect that a reply will take a longer time to write, it was common to reply with a short feedback email to take the pressure off themselves, describing that a reply will be delivered as soon as it is possible. The expectations put on their coworkers was different, as they said that themselves would get anxious if they did not get a reply within one week from when the email was sent. As one feels stressed and pressured to reply to email that they receive, they do not expect others to reply within the same timeframe. Arbetsmiljöverket (2015) established that the use of technology is correlated with greater pressure on the working individual. Could this pressure be of sociocultural nature rather than caused by technology itself? Our results support the theory from Pielot & Church (2014) that social pressure is one of the key factors behind why many workers reply to email as quickly as possible. Something that our study shows is that certain strategies to counteract this feeling of social pressure have been developed, and that people that use them show less signs of being affected by email overload.

Renaud et al. (2006) presented research regarding 23% of all work hours being used for email management in some way. If email is managed outside of all other tasks, one could assume that it will affect the leisure time of the participants. As a result of our study, we suggest that organizations as well as individual information workers should take these aspects of email into consideration and to either implement changes on individual or organizational level, in order to establish a social culture or norms that allows people to feel less socially pressured to multitasking and manage email at the same time as other tasks is performed.

6. Conclusion

The research question of this thesis aimed to identify how individual information workers manage and reply to incoming email. The answer to this question would help us to extend our knowledge and understand in what manner information workers manage their email, as well as contributing with valuable insights to practitioners, designers and researchers.

Our study has through qualitative interviews established how individual information workers manage and reply to their work email, and what is behind their choices when it comes to these actions. Information workers today write emails to be as compressed as possible knowing that their coworkers receive a lot of email and spend a limited amount of time reading the information. The way information workers prioritize email reflect this, giving emails that are simple high priority together with email that is urgent in nature. Email management is a time consuming and important task for the information worker. Finding a balance in email management can be problematic for the individual information worker, if done quickly it increases the risk of mistakes while doing it precisely can take time from other work. Individuals and organizations should be mindful of these facts and work to prevent it since failing to find a balance can lead to email overload which is a contributing factor to technostress in the workplace.

We found that from when it was first adopted by organizations in the middle of the 1990s, the use of email has not changed significantly. The way you write and reply to email may
have changed, but the shared expectations on email use is still the same. Even if one expects to get a reply, it is not always expected to happen immediately. We found that people have different expectations on their own behavior compared to what they expect others to do. Practices that prevent the need of managing email outside of working hours, as well as creating an environment where email does not put social pressure on the individual information worker would be desirable to establish, while negative effects that in the long run could lead to an unbalanced relation between work and life and a higher cognitive load caused by stress would be reduced.

As our study focuses on information workers, it could be of value to examine email management and its effects on other groups of workers, to find if email overload is a general problem or something that affects this population only. This could also lead to the finding of other strategies that would be successful to implement in order to reduce the impact of stress and productivity loss through the use of technology as well. When it comes to future research regarding email overload and information workers, we suggest that a more longitudinal study with a heavier focus on media elicitation or data logging would be appropriate. If the finding of this study could be developed into different scenarios that the research participants could be assigned through a longer period of time, that would show the potential success or failure of our findings and how they could be improved further.

6.1 Conclusive takeaways
In this section, we present the concluded takeaways for each of the targeted audiences.

6.1.1 Takeaways for practitioners
- There are norms and social pressures that affect individuals’ emails management, these should be brought to light and be discussed in the workplace. Creating workplace guidelines for email management could help reduce stress and increase productivity.

  - Email right now is often seen as an additional activity that take place parallel to other working tasks, this leads to the information worker managing email during breaks and leisure time if they do not have enough time during the day to work with email.

  - Write short and concise emails, to exclude information that contributes to a greater cognitive load.

  - Email is monitored almost constantly which may have a negative effect on productivity.

6.1.2 Takeaways for designers
- The use of email in mobile phones differ from the use on a computer. Rather than focusing on replying and writing, mobile email applications should focus on a clear view of subject, sender and email content and allow the user to sort email into categories.
The search function in email clients is of great use and has to an extent replaced the functionality of techniques used to label and sort email. The search function can be used to create temporary folders that fulfill the need of the user at every given moment.

### 6.1.3 Takeaways for researchers

- Email is still treated as an asynchronous tool by information workers. While reading email happens quickly, replying is a thought-out process that is carefully considered in advance. Email behavior do not show signs of becoming more synchronous and similar to chats and SMS, even though earlier research suggests so.

- Information workers highly prioritize email that is easy to respond to, which should be taken into account when creating algorithms for email prioritization.
References


Mano, R. S., & Mesch, G. S. (2009). E-mail characteristics, work performance and distress. Computers in Human Behavior, 26(1), 61-69. doi:10.1016/j.chb.2009.08.005


Appendix 1: Interview Guide

Categories

1. Demographic questions
2. Email management questions
3. In-situ reflections
4. Conclusion

1. Demographic Questions

a. Age
b. Gender
c. Title/Work position
d. Work experience as information worker
e. Earlier work experience.

2. Email management

We start by asking the participant about how they manage email today, general questions to trigger them to think about how they email management look like.

a. If you reflect upon your work situation, what email clients do you use? On which platforms?

b. Use of platforms differently? (For example: Phone, computer, ...?)

c. How do you handle email today?
   - Do you read all email you receive? Do you try to read all of your email?
   - How often?
   - Do you limit yourself from checking the inbox?
   - Do you delete mails?
   - Do you sort email into folders and labels?
   - Do you find it difficult to find information in your inbox when you need to?

d. How do you usually reply to email?
   - Email?
   - Other platform?
   - Face to face?

e. How do you expect others to manage their email?
3. In situ-reflections

“Open your computer and your work related email client and navigate to your sent email folder. Look at your most recently sent email. We are not interested in content, only the decisions you made concerning every email. Replies to email received is what we want to investigate the most as it is core to how you receive and respond to email rather than how you reach out with new questions or information.”

Repeat: Mail (short/long/complex/simple):

a. When did the email arrive?
   - How did you act when you noticed that it had arrived?
   - What did you do when the email arrived and how did you choose to act?
   - When did you answer? (Time span).
   - Why did it take the time it did to answer?

b. Why did you reply to this email in the way you did?
   - What was the email about?
   - Who sent you the email?
   - How much time and effort did you spend writing this reply?
     Difficulty? Easy? Time consuming? Quick?
   - If not: Why didn’t you answer right away?
   - What in the email made it (simple/complex) to reply to?

c. If you think about the situations when you need to reply to an email that you have received:
   - What kind of email do you think is easiest to reply to?
   - What kind of email is hardest to reply to?
   - When you read emails, how do you read them?
     (Top to bottom, identify the most important, et cetera.)

4. Conclusion

a. Some research suggest that 23% percent of the general information workers work time goes to email administration in some way and 70% of all emails are in some way managed within the 6 first seconds of arrival. What are your thoughts about that?

b. How would you say that email management has changed with time? (From the start of your career until today)

c. Do you have something to add?

d. Can we contact you for potential follow up questions?
Hi!

The following information relates to the principles of research ethics published by Vetenskapsrådet (2002). These principles specify what rights you as a participant in an interview for a scientific study have. We will as well explain the purpose of your participation and the study in this document.

The study is conducted by Kristoffer Forsman and Arvid Horned, students at the department of informatics at Umeå University, and it is a part of our magister-thesis and our studies at the human computer interaction programme. The purpose of the study is to examine the management techniques applied to email, from the perspective of an information worker like yourself.

In order to fulfill the purpose, the study is conducted through interviews with participants closely connected to the selected topic, that can provide us valuable insight regarding email management. The goal is to identify findings that contribute to the field of research that is useful for future researches in the same area. When you participate in our study and the interview, you give us the permission to use the data that you contribute in order to fulfill the our study.

Your participation in our study is voluntary and you have the right to decide how long the interview will proceed, as well as under what conditions the interview is conducted. You also have the right to withdraw at any moment without consequences for you as participant.

The information you provide through the interview will be used to fulfill the purpose of this study, and it might as well be used in the creation of a scientific research article with the same focus as our thesis, conducted by us and our supervisor Rikard Harr, associate professor at the department of informatics at Umeå University. Your information will be stored with respect to the confidentiality requirements of Vetenskapsrådet (2002). This ensures that the information collected through the interviews will be handled so it will not be accessed by anyone other than the three of us conducting this thesis and the potential article, and we will act with professional secrecy and not spread any information that could be harmful for you as a participant or your employer.

Our thesis will be published on the nordic archiving and publication-platform DiVA as soon as we have been provided with a passing grade. If our work is made in to a scientific research article as well, more information will be provided to you regarding on where to find that article. If you as a participant want to get noticed when the thesis or the article is available for you to read, please inform us in connection to the interview or through email.

Best regards,

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