Too much information!
Information-overload from an IT-management perspective

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Abstract

As workplaces have become more digitalized and improvements constantly being made in order to optimize performance, it becomes pivotal for managers to understand how stress within organizations can be linked to the information- and communication technology within them. This thesis addresses the research gap of several studies existing regarding technology-related stress, but where a majority of them are quantitative in nature and overlooking the important aspect of organizational culture. The purpose of this thesis is to create an understanding regarding how managers perceive technostress in their organization, and how counterstrategies, if any, are applied. The added value of this research is that it highlights how poorly understood the problem of information overload is amongst certain managers, while highlighting the cultural aspects within organizations and their contributions to the problem. The results show that while many aspects related to information overload are noticed by managers and employees alike, very few – if any – counterstrategies exists in order to highlight and combat the problems that information overload entails. While individual practices existed, few could be realized at an organizational level without first addressing company culture.

Keywords: IT-management, Information overload, Technostress, Organizations, Interruptions, Multitasking

1. Introduction

There is a crisis in Sweden regarding stress in the workplace. Between 2010 and 2014 the individual reports of work related health issues due to ‘social and organizational reasons’ in Sweden have risen by 72% (Arbetsmiljöverket, 2016). The fact that stress related sick leave is occurring within Swedish organizations presents a serious problem that will have an effect on every type of institution to varying degrees. From a managerial point of view these occupational health related issues can prove to be extremely costly when it comes to the loss of capable employees, the associated expenditure of bringing in new employees as well as the training associated with hiring new employees.

According to Arbetsmiljöverket (2016) an employee that experience work related issues, such as stress, will on average suffer a 38% loss of output, equaling to a production shortfall of 15 hours per week. This will obviously lead to a major decrease in both employee wellbeing and revenue income - affecting not only the management team but the organization as a whole.

Apart from the loss of output, over 200 cases per year are reported to be deaths related to work stress - and the annually reported sick leave of employed swedes, where diagnosis indicate occupational burnout, have been estimated to be 32.000 cases (Arbetsmiljöverket, 2016). While this increase in stress is occurring we are also subject to a cultural change where information technology is rapidly changing the working environment, emerging in businesses where it used to be less prominent – ushering in an era where information
technology is playing a big part in the majority of businesses and organizations (Forman et al., 2014).

Because of the fact that IT plays such a pivotal role within organizations there are several researchers and reports connecting the rise of stress within the workplace to the large influx of technology – as will be shown in this thesis. However the negative aspects of stress related to information technology is not a new phenomenon. As early as 1984 the concept of technostress was coined by researcher Craig Brod, describing the inability of people to cope with computers and the stress this causes on the psyche of these people (Brod, 1984). One of the categories connected to technostress is information overload, and within the information overload spectrum there exists subcategories that contribute to this overload, such as multitasking and interruptions which will all serve as the major focus within the thesis regarding both the related research and the performed interviews.

While several studies highlight the aspect of information overload from an individual perspective (e.g Speier et al., 1999; Pijpers, 2010; Shenk, 1998; Mark et al., 2008) few of them highlight the organizational impact, and the value in pushing for a managerial response that would be required in order to combat this problem. This coupled with the fact that many of the performed studies are qualitative in nature form a void where more research needs to be made from both the managerial aspect towards the organizations and the individuals within them that are inevitably affected by the organizational culture.

By conducting interviews, and examining related research, this thesis aims to examine whether or not information overload is something that is being taken into account or even acknowledged amongst the interviewed managers and to explore the importance of combating information overload within an organization.

1.1 Purpose of thesis & research question

The purpose of this thesis is to create an understanding regarding how managers perceive technostress in their organization, and how counterstrategies, if any, are applied. The research question is formulated as; “How is the issue of information overload perceived and addressed within organizations and how can managers in organizations work to highlight and combat information overload within their respective organization?”

1.2 Delimitation

The delimitation being made is towards researching IT-related stress in general within the workplace, as this would provide far too much information in order to draw any feasible conclusions from, and also since it would not contribute to my research as a whole. The same will go for the larger aspect of technostress as this encompasses a plethora of different underlying subjects and items related to these subjects. Therefore the focus will be on information overload and the related aspects of multitasking and interruptions that contribute to the phenomenon of information overload.
2. Related research

Information technology is only becoming a more and more relevant factor within organizations, forcing knowledge workers and managers alike to adhere to both the strengths and the weaknesses associated with it – moving society to a postindustrial and information based one. This has been enabled by technologies for control, automation and communication (Forman et al., 2014). While research is being conducted within the informatics field on many different aspects related to the rise of information technology, the research about stress related to technology and information overload remains relatively fragmented. Because of this, the aim of this chapter is to condense the research related to technostress in order to provide an overview and understanding about the phenomenon.

2.1 Technostress & Information overload

The object of study – being information overload – is a subcategory described within the broader aspect of technostress, a concept emanating in 1984 by Craig Brod, described as the inability to cope with- and accept computers, an overidentification with computers and how that will lead to a feeling of stress within the users of such technology (Brod, 1984). Since then, several other studies have been made within the areas relating to technostress, creating a new area of research (e.g Wang et al., 2008; Jackson et al., 2003; Tu et al., 2005). This research adheres to one of five categories linked to technostress within an organization.

The categories that have been described within research regarding technostress are; Techno-Invasion, Techno-Overload, Techno-Uncertainty, Techno-Insecurity and Techno-Complexity. The subject of information overload falls within the described category of ‘Techno-Overload’ – including information overload, interruptions and multitasking (Ragu-Nathan et al., 2008; Tarafdar et al., 2011; Wang et al., 2008). The related research that has been gathered for this thesis is in accordance with the last aforementioned category; techno-overload.

Information overload can be summarized as exposure to information exceeding the necessary amount in order to complete the task at hand, leading to a greater processing of the information and the necessity to do more in a shorter time due to technological assistance (Tarafdar et al., 2011). The available information also leads to employees receiving a tighter timeframe to complete the tasks within, and changing the work habits to accommodate for the new technologies being presented, having more relevant information than what can be assimilated and the rapid growth of information (Speier et al., 1999; Pijpers, 2010; Tarafdar et al., 2011).

The effects of information overload show that it has a number of negative effects on the person experiencing it; with effects ranging from a decrease in decision quality, decreasing the ability to identify useful information whilst increasing the time required to make decisions, increasing mental workload and increasing role conflict within the organization as well as and overall dissatisfaction with the job itself (Speier et al., 1999; Tarafdar et al., 2011; Viegas et al., 2015).

A study made by Tu et al. (2005) showed that amongst workers it was the older employees that first and foremost were affected by information overload and the related aspects. The theorization made by the authors were that older employees might form a more rigid way of
thinking where they complete their assigned tasks in a more conventional sense and rely upon previously learned knowledge - whereas younger employees might have an easier time adapting to a new and changing information landscape.

This is contradictory to the study made by Tarafdar et al. (2011) where they conclude that older people in general experience less technostress than young people – however that encompassed technostress as a whole, whilst the study by Tu et al. (2005) mentions techno-overload specifically, in regards to older employees. The difference could potentially be a cultural difference, since Tu et al. (2005) studied Chinese men – mentioning that workers above the age of 35 bears the greatest burden of family support, while the study made by Tarafdar et al. (2011) was performed in the US, where the family culture could be different.

While search-engines and the access to information can provide an improvement to overall work and the employees’ self-confidence, one can reach a threshold where the information simply does not add anything to the employee and where the problems will start arising, such as selection problems. Sifting through the various information and deciding on what to use and what to leave behind – where too much information end up being bad (Pijpers, 2010).

With technology also being readily available for both managers and employees, with the ability to connect wirelessly on their commute to and from work, when they get home and in every way – there is a major risk involved that the employee feel forced to respond when receiving the mail, and with a feeling of discontent when not being connected. This form of exposure occurring on a continuous scale can lead to the employees feeling that they are never truly off from work – which in turn leads to a negative effect on job satisfaction (Ragu-Nathan et al., 2008).

The inability to efficiently handle and use information can cause what is being described as information fatigue / information fatigue syndrome – a term coined by psychologist David Lewis, a symptom of unrelenting exposure to excess information (White, 2000).

This is a problem that manifests itself in the fact that technology has the ability to process, store and deliver information at major speed, while constantly experiencing a rapid advancement - whilst the human brain and nervous system remains largely unchanged since the time when we used to dwell in caves. Our ability to process information has therefore not remained on par with the technological capacity to do the same – leading users to have feelings of irritation, frustration, anger, vulnerability, helplessness, and impatience (Pijpers, 2010).

The result of this information fatigue can manifest itself in more than just a decrease in productivity, but actually result in major health related issues such as increased blood pressure, digestive disorders, cardiovascular stress, stomach and muscle pain as well as hypertension and increased pressure on vital organs (Pijpers, 2010; White & Dorman, 2000).

The various proposed solutions to combating information overload can include the implementation of email policies in order limit the amounts of email being sent within the organization, identifying and codifying knowledge to collate the information within repositories (Tarafdar et al., 2011). Other proposed solutions are limiting of the output; where the same information will not be sent by several different mediums (such as calling,
emailing and IM:ing), providing appropriate training when using information technology, filtering the information and thus eliminating the flow of information not vital for the work tasks performed (Tarafdar et al., 2011; Shenk, 1998; Pijpers, 2010; Tu et al., 2005).

One clear contributor pertaining to information overload is interruptions. They can consist of alerts such as email, IM or telephone calls, pressuring the worker to attend to the information immediately and in doing so leading up to the stress associated with information overload, and decreasing performance on complex tasks (Tarafdar et al., 2011; Speier et al., 1999).

2.2 Interruptions

Interruptions are a natural part of the working environment when it comes to most businesses. For managers it can prove to be even more so than for regular employees, even if everyone is subject to interruptions. The problem with interruptions is that there is no clear way of avoiding it, as one will always be subject to them. An interruption in this sense can be categorized as a distraction leading to the worker having to address the distraction before being able to return to the task at hand (Jackson et al., 2003).

One of the biggest culprits in this aspect is e-mail, one of the most commonly used forms of communications. In a business setting these interruptions can prove costly to the company at hand. In a study performed by Microsoft it was shown that if a worker was interrupted by an email notification, the average time it took for them was 24 minutes before they were able to return to their previous task, and if interrupted by a telephone call the recovery time was estimated to be upwards to 15 minutes or more (Hemp, 2009; Jackson et al., 2003).

This becomes even more troublesome as a study made by Basex (2005) shows that 28% of a knowledge worker’s day consists of interruptions in one way or another, resulting in a total loss of 2.1 hours of productivity. According to the calculations of the report – factoring in the entire United States – these 2.1 hours leads to an annual loss of 28 billion man-hours, translating to an estimated lost business cost of 588 billion dollars in the US alone with the assumed salary for knowledge workers being $21/hour (Spira & Feintuch, 2005).

It is worth remembering that these numbers only describe the potential loss of revenue due to interruptions themselves, and does not account for any additional costs that can be related to sick-leave or stress related problems that has been previously mentioned throughout this report. Worth noting, however, is that all interruptions are not inherently bad. Answering an important mail, call or receiving help from a colleague with business related issues is obviously going to be a part of the work environment, and while smaller and short interruptions may not be disruptive all the time, a study made by Gillie & Broadbent (1989) shows that even an interruption related to the task being performed can still be disruptive in some cases if it requires the users immediate attention, but as stated by Speier et al. (1997) simpler interruptions may facilitate work whereas complex interruptions prove more disruptive.

When it comes to interruptions one of the major aspects is dealing with incoming emails. There seems to be a social and personal expectation to answer every email message, which in turn can drain and lower the morale of the user. A study performed by AOL showed that 60%
of the respondents checked their emails while in the bathroom, and 11% of the respondents had hidden the fact that they were checking their email from a spouse or other family member, making the management of emails a complex and time consuming issue (Hemp, 2009).

According to an online survey that were performed by Basex, 62.4% of the respondents answered that they considered a friend sending them an email, with a non-business related question, being an acceptable interruption – showing that both knowledge workers and executives did not mind receiving an interruption that was not business related, making the problem a difficult one to overcome (Spira & Feintuch, 2005).

Not only do the average knowledge worker spend copious amounts of time dealing with emails, but it proves to be another challenge as 65% of sent email messages does not provide enough information for the recipient to be able to act upon this information without another message being sent, and 30% of the interruptions made within a development firm were problems that the interrupters themselves could have handled (Jackson et al., 2003; Van Solingen et al., 1998). This can force the recipient to formulate a secondary email in response to the first, requesting additional information, further pushing up the decision making cycle even further, as they are waiting for clarification – not knowing when a response will be given, if it was received or if it is simply sitting in the recipients inbox because they are also swamped with emails (Hemp, 2009).

There are a multitude of proposed solutions entailing interruptions. In a study made by Van Solingen et al. (1998) it was shown that when informing and implementing a policy regarding the negative aspects of interruptions they decreased by 30% during the measurement period alone. Further suggestions to combat interruptions and increase productivity are to minimize personal visits within the office, keeping interruptions in meetings to a minimum, updating documentation practices, turning off automatic notifications on the email program, minimizing the amount of sent emails and the content within them, avoiding using functions such as “Reply to all” or “Send to all” when using email as well as making sure that program-related issues can be dealt with by professional IT-support and that the employers recognize the problem it entails (Van Solingen et al., 1998; Hemp, 2009; Jackson et al., 2003; Tarafdar et al., 2011; Marulanda-Carter & Jackson, 2012).

In a study performed by Adler & Benbunan-Fich (2015) it was also shown that people who multitasked were more inclined to take a larger quantity of breaks, in what they described as ‘self-interruptions’ which is another aspect that also factors in to the aspect of interruptions themselves, showing that multitasking is also a prominent factor when it comes to interruptions.

2.3 Multitasking

Multitasking, or work fragmentation as it is described by Mark et al. (2005) entails the break in a continuous activity and the switching between different activities. This leads to the person performing the task to try and accomplishing more in a shorter time, which is connected to the stress of information overload (Tarafdar et al., 2011). Multitasking exists in our everyday life and occurs without us even knowing; we are perfectly capable of breathing
automatically whilst performing other tasks, such as reading a report or driving a car, without giving it a second thought. But when attention is needed to be given on a specific task at hand – multitasking is not preferable as a method of choice.

Our brains are processing information in a sequential fashion and not in a parallel one, making the very essence of multitasking something that humans are not equipped to do, leading to distress (Pijpers, 2010; Tarafdar et al., 2007).

When the phenomenon of multitasking was studied it showed that the respondents, when faced with a multitude of information, trying to multitask and perform several actions at the same time actually had a dropped IQ score of 10 points compared to their normal levels, showing twice the decline in their IQ score compared to that of marijuana users in similar tests. Apart from that, people that multitasked were also performing worse in regards to the testing of cognitive functions, compared to control groups that solved their problems sequentially (Hemp, 2009; Rubinstein et al., 2001; Adler & Benbunan-Fich, 2015).

Ironically one might perceive multitasking as a way of getting things done quicker, but Tarafdar et al. (2007) argues that the excessive use of multitasking would make it harder to focus on one specific thing for a reasonable length of time – allowing for thoughts of the unfinished tasks to appear, and it was also shown in a study that information workers averaged 3 minutes of work on a single event before switching to another event (González et al., 2004).

This would mean that the more one attempts to multitask, the more time it will take to complete the tasks – leading to a sense that there are too many tasks to be performed, without enough time to perform them, increasing the sensation of stress and the potential feeling of information overload (Tarafdar et al., 2007).

This factors in to the problem of information overload in the sense that for every type of task that’s being performed simultaneously, brain capacity will need to be divided to various tasks, decreasing the overall performance and quality of the work being performed (Pijpers, 2010).

This will force the knowledge worker to spread out the capacity, leading to problems such as the inability to prioritize, switching between different tasks to perform, working at a higher pace in order to make up for the diversion of brain capacity.

This does in turn lead to an experience of information overload as it forces the employee to process more information and do more in less time – leading to a negative association with the task at hand and also resulting in that the person takes more breaks (or so called self-interruptions). This is made in order to overcome the negative feelings that they have associated with the task, only to experience the same thing when they return to the task to see that the difficulties remain (Tarafdar et al., 2011; Pijpers, 2010; Adler & Benbunan-Fich, 2015).

Solutions to the problem of multitasking are scarce, as it would appear that the management of various activities are more of a daily occurrence within the modern work life of information workers, than mere fringe events (Mark et al., 2005). Therefore research specifically describing the solutions or fixes to multitasking are lacking, with more studies highlighting the phenomenon rather than the possible solutions. González et al. (2004) suggests that the design of the information technology might play a part in how to combat
the problem, allowing for workers to group documents and applications, as well as saving the state of a series of tasks in order to revisit them later. By limiting the number of interruptions that a worker faces during their day, Mark et al. (2005) theorize that this could have the potential of also limiting the multitasking having to be performed by affected worker.

2.4 Summary

Information overload, interruptions and multitasking are all sub-categories of a larger category named ‘Techno-Overload’. The other categories besides Techno-Overload are Techno-Invasion, Techno-Uncertainty, Techno-Insecurity and Techno-Complexity. Together these make up what is described as ‘Technostress’. (Ragu-Nathan et al., 2008; Tarafdar et al., 2011; Wang et al., 2008).

Information overload occurs when an individual is presented with more information than what is necessary for them in order to perform their work. The most common source for information overload are through the use of information technology, email clients and other tools that originally was intended to make the flow of information easier and more accessible for the knowledge worker. The effects of information overload can manifest itself through both psychological and physiological ailments to the person experiencing it and lead to a decrease in performance and various illnesses if left unattended. (Tu et al., 2005; Tarafdar et al., 2011; Speier et al., 1999; Viegas et al., 2015).

Interruptions occurs when the worker have to deviate from their original task, or face something that requires their immediate attention, such as an incoming telephone call, an email notification showing up on their screen or a coworker contacting them verbally. Studies show that 28% of a knowledge workers day consists of interruptions and, as the study was performed in the US it showed that with an interruption frequency of 28%, it led to an annual loss of 28 billion man-hours. 65% of sent emails were also shown to require some sort of response in order to clarify the information within them (Hemp, 2009; Jackson et al., 2003; Spira & Feintuch, 2005).

Multitasking is a break in a continuous activity and the switching between different activities (Mark et al., 2005). When studies were performed on users who were multitasking in one sense or another it showed a decrease in IQ by 10 points compared to their normal tests, and also showed that the people that were multitasking performed worse than the people that was not multitasking, and instead solved one task at a time. Multitasking was argued to allow for thoughts of the unfinished task to hinder the process of completing the current task being performed and also leading to the person taking more breaks (called self-interruptions) than the respondents that were not multitasking (Tarafdar et al., 2011; Tarafdar et al., 2007; Pijpers, 2010; Adler & Benbunan-Fich, 2015).

The described solutions and/or strategies for the phenomena of information overload, interruptions and multitasking are several. They have therefore been condensed into this table in order to encompass as many as possible in a way that is as confined as possible.
Suggested solutions/strategies regarding:

<table>
<thead>
<tr>
<th>Information Overload</th>
<th>Interruptions</th>
<th>Multitasking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email policies</td>
<td>Email policies</td>
<td>Limiting interruptions</td>
</tr>
<tr>
<td>(Tarafdar et al., 2011)</td>
<td>(Jackson et al., 2003)</td>
<td>(Mark et al., 2005)</td>
</tr>
<tr>
<td>Filtering information</td>
<td>Understanding effects</td>
<td>Changing Design/Usage of IT</td>
</tr>
<tr>
<td>(Shenk, 1998)</td>
<td>(Marulanda &amp; Jacksson, 2012)</td>
<td>(González et al., 2004)</td>
</tr>
<tr>
<td>Training employees</td>
<td>Informing employees</td>
<td>Informing employees</td>
</tr>
<tr>
<td>(Tu et al., 2005)</td>
<td>(Van Solingen et al., 1998)</td>
<td>(Van Solingen et al., 1998)</td>
</tr>
</tbody>
</table>

Table 1. Table detailing proposed solutions/strategies to deal with information overload, interruptions and multitasking.

While the research presented shows a connection between stress, information overload, interruptions and multitasking, the discussions made on how managers must act, and especially the social aspects related are many times lacking, even when the organization itself is mentioned. This suggests that a possible disconnect exists between individual aspects and the impact made on organizations; especially from a managerial perspective and from a social perspective. This shifts focus from a wider picture and instead leave much up to the individuals rather than the managers and the organizations themselves (Speier et al., 1999; Pijpers, 2010; Shenk, 1998; Mark et al., 2008; Viegas et al., 2015).

The consequences of not understanding the negative aspects of information overload and how this affects the employees and organizations will pose a risk where the problems not only persists, but could actually grow, as shown by the stress-related statistics presented by Arbetsmiljöverket (2016) in the introduction. Failure in adhering to the problems will therefore lead to an even larger stress aspect where individuals and organizations alike are paying the price.

3. Research methodology

This part entails the research methodology used for the thesis as a whole. The workflow will be presented in a chronological order describing the choice of methodology the collection of data and later the analytical process used to derive conclusions from the collected data.

3.1 Choice of methodology

A qualitative study were chosen in order to get a better understanding of the personal aspects and viewpoints shared by managers, whereas a quantitative study would present the challenge of finding enough managers to be able to draw reliable conclusions, but also risk missing important information that could not be expressed through a quantitative research model (Hancock, 2015).

The design of the interviews themselves are semi-structured and was chosen because of the nature behind the interviews; seeking to understand both the personal experiences of the
managers, but also their inputs regarding the organizational aspect of information overload and policies.

The interviews also aimed to examine whether or not information overload have affected them or their work group and (if ‘yes’) in which capacity. Using semistructured interviews compared to structured interviews has the advantages of dealing with cues in order to prompt more detailed information from respondents, however they require a greater deal of planning than unstructured or structured interviews – and can provide challenging when analyzing the interview to derive a comparison between diverse responses (Mathers et al., 1998). By recording the interviews and having the opportunity to revisit any responses with the interview respondents later on, it is unlikely for any major problems to arise through the usage of the semi-structured interviews.

The data analysis was made through the usage of qualitative content analysis, based on data gathered from narratives, and through the usage of meaning units, condensed meaning units, codes, sub-categories and categories (Graneheim & Lundman, 2004). The style of the analysis was inductive in its nature, and will be described further below in its respective header.

3.2 Literature appraisal
The literature that has been used for this paper were gathered early in the process, in order to both broaden the area of knowledge, as well as gaining an in-depth understanding of the problem at hand. The initial literature consisted primarily of research reports mentioning technostress, different variations of information overload as well as information that were gathered both through fellow researchers and through the use of academic search engines. From these articles and searches a baseline could be formed where additional research could be located primarily through related articles to the ones already obtained via Google Scholar, the Umeå University library search engine and the databases connected to the Umeå University library. The related research gathered were the basis upon which conclusions, interview questions and analysis’s where made throughout the report.

3.3 Sampling
Since the research regards information overload from a management perspective; a qualitative convenience sampling methodology was adopted, where a manager known to the researcher were initially chosen - and through referrals from this manager a snowball sampling proceeded in order to gain access to additional people operating in a managerial capacity, as recommended when dealing with small populations with specific characteristics (Ritchie & Lewis, 2013).

These additional people were chosen in order to gain insight into the reasoning of managers from various institutions, dealing with both IT and also having staff responsibility - adding additional weight to their input. Due to some of the managers being identifiable if age, gender or department were assigned to the particular respondents - it was chosen by the researcher to leave this information blank, in order to protect the anonymity of the respondents.
<table>
<thead>
<tr>
<th>Respondent</th>
<th>Managerial level</th>
<th>Area of current/previous work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Middle manager</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>2</td>
<td>Middle manager</td>
<td>Communications</td>
</tr>
<tr>
<td>3</td>
<td>Project manager</td>
<td>Software development</td>
</tr>
<tr>
<td>4</td>
<td>Middle manager</td>
<td>Education</td>
</tr>
<tr>
<td>5</td>
<td>Middle manager</td>
<td>Manufacturing</td>
</tr>
</tbody>
</table>

*Table 2. Table detailing the various respondents within the performed qualitative interviews*

### 3.4 Data collection

The data collection has been divided into two parts, the related research, where research papers were gathered, reviewed and connected towards the research question in order to solidify a literary basis, the second part consists of interviews performed in order to gain insight into what managers of various IT-institutions opines in regards to technostress and to compare their insight to that of already existing data.

The managers that were selected for interviews were deliberately chosen from different fields, ranging from manufacturing to development – the common denominator being that they were placed in a managerial position with the ability to have a larger influence over decision making than regular employees, and also managed their own employees.

The interviews were performed in a semistructured manner, allowing for the manager to use their own words and to express themselves openly. This also allowed for probing into the answers provided in order to gain deeper understanding and clarification of especially important aspects of the interview itself (Hancock, 2015).

The interviews were performed through a variation of mediums due to the geographical differences between the various respondents. Some of the interviews were gathered through recording applications for the android platform when the respondents could be met with face to face, where others were recorded using the nVidia shadowplay function for PC when the interview were performed using Skype – in order to simplify the transcription. Bell (2000) argues that recorded interviews are preferable since it allows for accurate quoting and replayability.

### 3.5 Data analysis

The analysis of the data was made through inductive analysis in order to ascertain common themes and to tie these themes together with the data gathered through the related research and to seek additional data that may serve to explain or analyze the material gathered through the interviews. This was done in order to explain the phenomenon of information overload through the eyes of managers, rather than try to derive an all-encompassing theory, which is in line with what Hancock (2015) states regarding inductive analysis.

The framework for the analysis was produced using qualitative content analysis in order to identify common themes within the data, locating both differences and similarities in the codes and categories. The reason it was chosen was that it focuses on both the respondent and the context, providing a valuable tool in order to not only analyze what was being said but how that could fit in to the context of a managerial perspective within an organization.
In order to showcase the process, an excerpt of the analysis will be presented below in accordance with the procedure that has been described by Granheim & Lundman (2004).

<table>
<thead>
<tr>
<th>Meaning unit</th>
<th>Condensed meaning unit</th>
<th>Code</th>
<th>Sub-Category</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Then, when I had the highest workload, maybe 5 projects running, talking to ten customers as well as employees – easily 30-40 emails each day. [...] It didn’t work.</td>
<td>Stressed when waking up. Situation did not work.</td>
<td>Too many emails</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can receive between 100-150 emails every day. This made me very stressed and made me overwork and wanting to satisfy both customers and managers.</td>
<td>Overworking. Trying to satisfy everyone</td>
<td>Emails</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[...] If we say that I get 100 emails in one day, maybe 50% are critical for me to answer to.</td>
<td>Few critical emails</td>
<td>Dealing with irrelevant emails</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very few. Fewer than five. Fewer than three. [...] But yeah... definitely a low amount of emails that could be considered “critical” – barely any.</td>
<td>Very few critical emails</td>
<td></td>
<td>Information overload</td>
<td></td>
</tr>
<tr>
<td>And it’s happened to me that the CEO have sent me an email at 3 o’clock at night (saying) &quot;Why isn’t this working?&quot; and it’s not especially fun to wake up to angry emails.</td>
<td>CEO emailing at night.</td>
<td>Managerial view on work</td>
<td>Culture</td>
<td></td>
</tr>
<tr>
<td>[...] There are times when we’ve been sitting, four people, and sent IM’s at ten o’clock at night, all four of us working.</td>
<td>Managers working from home with employees.</td>
<td></td>
<td>Sending &amp; Receiving info</td>
<td></td>
</tr>
<tr>
<td>[When asked about always being accessible] [...] It’s an incredible stress factor – because in today’s world it’s extremely hard to defend yourself from it.</td>
<td>Hard to defend yourself. Accessibility major stress factor.</td>
<td>Feeling stressed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[When asked about checking emails at home] [...] And then when I wake up I tend to go through [my inbox] again before I get to work, so there might definitely be a couple of hours at least.</td>
<td>Checking emails whilst not at work.</td>
<td>Working from home</td>
<td>Sending &amp; Receiving info</td>
<td></td>
</tr>
<tr>
<td>Yeah sometimes it happens that I read emails at home during the evening.</td>
<td>Reading emails at home.</td>
<td></td>
<td></td>
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</tbody>
</table>

Table 3. Example of meaning units, condensed meaning units, codes, sub-categories for the category Information overload from the qualitative content analysis.

### 3.6 Method critique

Having used the convenience sampling and snowball sampling there are some aspects worth noting. The first is that the usage of convenience sampling does not give a systematic or predefined approach and also that snowballing risk compromising the diversity of the sample frame (Ritchie & Lewis, 2013).
However - since the research and interviews themselves are not sensitive, nor gives the respondents any reason to answer in a particular way - having a clearly defined or systematic approach will not be as important as with other research. Using a convenience sampling also risks making the result become unrepresentative according to Hartman (2004), however not every respondent were selected through convenience sampling, and another precaution taken to counteract this was to try and find respondents within different organizations and different fields of work. It is also noted to be said that this thesis does not aim to derive an all-encompassing theory based on the answers from the respondents.

There will be some level of disproportion, as female managers in the private sector only account for roughly 30% of the managers in a study made 2014 (SCB, 2016). Due to the fact that the managers interviewed are primarily from the private sector, the diversity will therefore be compromised. In order to anonymize, neither the age nor the gender have been written, however both a gender and age equality have been strived for, with both men and women, with varying age and experience amongst the respondents.

3.7 Ethics
Ethically the research and the interviews performed have adhered to the ethical guidelines specified by Ritchie & Lewis (2013) and Vetenskapsrådet (2002) informing the respondents that the interviews would be anonymized, and that they could abort the interview at any time or decline to answer any questions that they felt uncomfortable addressing. The respondents were informed about the thesis and the purpose of it beforehand, and asked whether or not they could be recorded for the purpose of transcribing as well as the fact that after the transcriptions were completed the recordings would be removed. The respondents were also asked if the anonymized data could be used for potential future research, to which they agreed on the premise that it could not be connected to them personally.

4. Results
When performing the interviews with middle-managers within various fields of work, it turned out that several of them had experienced information-overload in their roles as managers. Within the result part of this report will be presented excerpts from interviews that’s been performed, detailing the strategy behind the interviews, and the answers given by the various respondents. The interviews started off with the respondents describing their current work and what their managerial level entailed when it came to both their IT-related tasks as well as their role in managing employees. Later this led on to questions about information overload, interruptions and multitasking, weaving in questions about proposed solutions to the eventual problems that they perceived. The result part will therefore follow this chronological order.

4.1 Background of the respondents
After informing the respondents of the report, outlining its purpose and describing the fact that they, at any point, could chose to withdraw from the interview, and that all the data would be anonymized – the first thing that were asked of the respondents was to detail their
own working experience within the field, and to outline some of the tasks that their job included.

Since all of the respondents worked within various fields this yielded some variations in their regular tasks, but the common denominator between the respondents were that they all, in one way or another, dealt directly with employees, customers and that IT was a tool that was being used by them on a daily basis. Respondent 3, one of the respondents that used the least amounts of emails on a regular basis, described their background as;

“I was a project manager for two years at a software development organization, where we dealt with web development, application development and consulting work. We also worked actively with trying to help the customer, since they did not always know what they wanted. In my role as a project manager it was common that the development was made in town X while the customer were in town Y, so I led a team with mostly developers, back end and front end, as well as graphical designers. I was both the person communicating with the customer, as well as the one planning up the work and what each individual were supposed to do and following up with it.” (Respondent 3)

The mapping of the respondents’ background served to understand in what sense they understood the information and communication technology that they were using, and also to gauge the general IT-understanding amongst the employees working for the respondents.

While the IT education varied for most of the managers, it was only respondent 3 that had an education primarily focusing on IT, where the other respondents had educations that weren’t focused on IT, but rather other aspects more closely tied in to their line of work, and it was only the employees of respondents 5 and 2 that had undergone any training when it came to the usage of their IT systems. After an overview of respondents and their employees IT-knowledge had been established, the questions were shifted towards information overload.

4.2 Information overload

When moving into the discussion about information overload the questioning regarded the receiving and sending of information. The information in this case could entail all manner of information ranging from information they received from their own managers, the potential customers, or from the employees within the organization. When asked about sending information it also entailed their own way of sending information out to the employees themselves as well as customers. The part regarding the handling of information have therefore been split in to two sub categories, being ‘Receiving information’ as well as ‘Sending information’. As the interviews came to show, email was a predominant factor when it came to information overload, resulting in a third sub category, detailing how the managers handled the information received through emails, and if the companies had any email policies to help both employees and managers.
4.2.1 Receiving information

When receiving information all of the managers mentioned that the most common ways of receiving information both from coworkers, and from customers, centered around the usage of email – predominantly through the software Microsoft Outlook and the usage of IM (instant messaging) services such as Skype or Microsoft Lync. While telephone and face-to-face meetings were also mentioned, emails seemed to be the most common way of being contacted. As a result of this, many of the answers regarding the receiving of information was largely based around receiving emails.

Respondent 2, dealing with many reports coming in – often sent exclusively as emails, expressed the feeling that the medium itself was unstructured, leading to problems.

“What is getting a bit lost with that form of reporting is the fact that it’s not as structured as if it could have been if it would have been performed through meetings, or if the reports were sent in as actual reports – or something similar. When it comes to email it can become a bit unstructured so it demands you to have a really good structure as a person.” (Respondent 2)

When receiving information from customers, respondent 3 tended to rather use Skype in order to communicate with customers, to the point where the respondent stated that it would be specified in the initial phase of the project.

“It’s been varying, but its commonplace that in the project plan; the communication is specified as to how it’s supposed to be handled, as well as the milestones, budget and so forth. Usually the medium of communication has been Skype, since the customer often resides in another city.” (Respondent 3)

When asked about whether or not the respondents felt as if the received information was manageable, there existed different opinions amongst the respondents, where respondent 1 and 4 experienced it to be a stress factor whereas respondent 3 argued that it was mainly a trait learned through experience on how to filter through the incoming information and what to prioritize.

Both respondents 1 and 4 also elaborated on it being something that became less prominent with experience or some type of organization. Respondent 2 believed it to be more of a policy issue where respondent 5 answered that;

“I don’t read everything that I receive *laughs*. It’s so much... you can see that people send information just because they think “Well that’s something that I [the manager : authors remark] should know about as well”. But if I’m the sole recipient of information and not CC:ed, along with 18 others, I usually read it because then it feels like it’s a bit more important, in my opinion.” (Respondent 5)

The consensus amongst the majority of the respondents was that; while receiving information, mostly through email, was stressful the worst aspects was before some sort of
system could be implemented in one way or another. After a system had been implemented the stress became more manageable, even if it was still a prominent factor.

Respondents 1 and 5 had both experienced co-workers suffering from burnouts, which they partly attributed to their coworkers not having a system in place on how to deal with receiving information.

4.2.2 Sending information

When asked about how the managers themselves sent out information, a majority of them did in fact use email, where respondents 5 and 1 both said that they would send out an email and also went over to talk to the person, if they worked within the same building. Respondent 2 answered that they usually did it over email or IM where respondent 4 most often used the internal platform dedicated to deliver information. Respondent 4 was also the only one that expressly had a policy when it came to delivering the information where the employees had been asked about how they perceived the information being sent out, stating that;

“I have to think both once and twice when uploading information, because my employees have, when asked, expressed that they have a very high workload. And this flow of information is a part of that workload. [...] So I filter [the information : authors remark] pretty generously, and we talk about that quite often – because I want to know from my employees if they think that I am filtering the information too much.” (Respondent 4)

Respondent 3 were the only one who stated that they tried to use as little written information as possible when reaching out to the customers or the developers, where they instead implemented the agile methodology of working in sprints and having shorter meetings, in person, every morning – and longer, more detailed meetings at the beginning of every two weeks, describing it as;

“[…] we hold a meeting where we decide that “We’re doing this” and “We’re not doing that”. That is something that’s being done together within the group where I ask the participants ‘Do you understand what you’re supposed to do?’ and they answer – ‘Yes I do’ or ‘No – explain more’. [...] If anything is unclear with the customer, or such, we set up Skype meetings with that customer.” (Respondent 3)

When asked about how they sent out information and if they could think of any way to improve their communication, respondent 5 stated that you need to decide on the relevance of the information, but that they still tended to CC emails sometimes when sending it out to other parties such as managers or employees;

“[…] sometimes you CC people even if you’re doubtful, [thinking : authors remark] these people might receive a lot of emails anyways. But at the same time you feel that ‘It’s good if they know’.” (Respondent 5)
Apart from respondent 3, the other respondents seemed to rely much upon both email and IM in order to send information to the employees as well as customers, leading the interviews onwards to discuss email policies and the implementations of such policies.

4.2.3 Emails
Because email dominated as the medium of communication, for a majority of the respondents, the interview moved towards whether or not there existed any policies when it came to how emails were to be sent out from a managerial level, or between employees themselves. Out of the five respondents, only respondent 1 reported that they had received any form of training or what could resemble a policy when it came to emails being sent out, with the others noting that there were no types of policies rather than policies regarding what their signature should look like when sending emails to customers or outside the company.

Respondent 3 gave a different account where they described that their ‘policy’, or rather the lack thereof, was an informal one, at the behest of the CEO of the organization, where it was formulated as;

“First off; there existed absolutely no policy – everything was just a mess. You could put it like this; if a policy existed it was on an upper management level where the CEO liked [word emphasized by respondent] to use email. That is; he liked to send out information over email and he expected everyone to answer to that information and respond to it through email – quickly. Like it should have been the most important thing in your life. That was his policy.” (Respondent 3)

Respondent 3 described that despite this, many of the employees still chose to not use emails within their internal communication, instead relying upon other types of software or to simply talk amongst themselves verbally, but that an email policy would be favorable, especially when choosing how to prioritize the emails that were being sent out within the organization.

Respondent 4 said that they currently had no policy rather than the respondents own policy of filtering the content before sending it to the employees, while respondent 2 described the lack of policies regarding information exchange as troubling;

“I believe that our organization would fare better by having a bit more policies, routines and processes. As it is now it leaves much up to the individuals, it demands that you have individuals that have a very good structure – and on some key positions within the organization there exists people that does not have a good structure, and that allows for decisions to fall between the cracks.” (Respondent 2)

When asked if respondent 5 believed if an email policy were necessary within their organization they answered that;

“No, I don’t think so. There’s not especially much unrelated content. Or at least not as much that it’s causing distractions.” (Respondent 5)
While a majority of the respondents considered policies to be necessary in one way or another, it was hard for the respondents to pinpoint possible changes that could be made in order to improve upon, or create policies themselves, rather than their own feelings that policies might be required.

**4.2.4 Culture**

The interview lead on to discussing the organizations views on information-overload and it left the respondents open to talk about the organization as a whole. While not questioning specifically about the organizational culture, talking openly about the various aspects presented information regarding the existing culture that both the respondents and employees faced.

Respondent 2 described that it had happened that they’d stay up late during the night and work, and that it was something that other people within the organization also did;

“There are times when we’ve been sitting, four people, and sent IM’s at ten o’clock at night, all four of us working. And then you kind of have to be able to say ‘Ah, what the hell, we need to stop doing this’.” (Respondent 2)

However, when asked about whether or not technostress was something that were discussed within the organization, respondent 2 answered that;

“Yes. That is something that we talk about quite a bit. [...] You’ve got to take the discussion with the person [experiencing technostress: authors remark] about the fact that they have to be able to disconnect – separating free time and work, which I think many people have an issue with. Bringing home your work phone, answering emails at eleven o’clock at night and reading emails, first and foremost, I don’t believe to be good at all, you need to be able to separate it.” (Respondent 2)

Apart from this, both respondents 2, 3 and 4 mentioned that it was not uncommon for them to answer or receive emails during the evenings after work, where respondent 4 also mentioned that it was not uncommon for them to answer emails during the mornings as well, making it into a routine to do so. Respondent 3, whilst not talking about staying up during the night to work, they mentioned that it was not uncommon for the managers to receive emails from the CEO late at night stating that;

“And it has happened to me that the CEO have sent me emails at 3 o’clock at night saying for instance ‘Why isn’t this working?’ And it’s not especially fun to wake up to angry emails.” (Respondent 3)

Respondent 2 described that whilst it was not an expressed policy within their organization, that such behavior were condoned, people that performed well and worked a lot had the opportunity to rise quickly in the ranks;
“And I might add that the company where I work at... that it’s easy to make a career here if you’re performing well, so a lot of people take that chance. It’s very open and you can rise in rank pretty fast if you are good at something. Some people might see that and therefore they ignore the warning signals and just go for it by themselves. [...] And then you might compete with other people that work in the same way themselves, comparing yourself to them.” (Respondent 2)

Out of the five respondents, respondents 2 and 4 mentioned that technostress was something that was discussed within the organization, while the other respondents had not heard about any discussions on the topic, or that it was not separated from other stress related issues in general. Respondent 5 mentioned that the only discussion being made was from the upper management talking about how they dealt with technostress;

“Well we’ve had the upper management talking one time about how he handled that type of thing [technostress : authors remark]. And he said that, while he was always available on phone he never really bothered about emails, because he thought that if there was really critical they could just call him about it... So that was the thoughts being raised, and maybe that it was that way we others should reason as well.” (Respondent 5)

After the thoughts on the culture within the organization when it came to information overload, the interviews moved on to discussing interruptions, and how they were perceived within the organization.

### 4.3 Interruptions

When it came to interruptions all of the respondents reported that they had experienced it themselves in one way or another. Emails were the predominant reason behind the interruptions for respondents 1, 2, 4 and 5, where respondent 3 stated that before they started to avoid emails that it was major source of interruptions for them as well.

Respondents 1 and 2 described that they both received at least 100 emails every day in their role as managers where respondents 3, 4 and 5 estimated that the number of emails that they received ranged from 30-60 every day. When asked about how much time that was spent on dealing with these interruptions respondent 1 stated that it was something that was constantly going on throughout the entire work day, both for him, and others that worked within a managerial position in the organization;

“I have two computer screens. I do my work on one of the screens and on the other I’ve split it between Lync and my inbox for the incoming email. My inbox is constantly visible for me, and it needs to be like that.” (Respondent 1)

When asked whether or not any type of policies existed within the organization to combat interruptions, none of the respondents knew of any such policies, and both respondent 1 and 5 described that they frequently met with people face-to-face, or seeking verbal confirmation
over a sent email, in order to make sure it was received. Respondent 3 answered that the lack of any policies surrounding interruptions did cause the employees to experience them, and later in the interview also accredited it to emails being sent late at night;

“But being interrupted, dropping everything because of bad routines and such – answering calls, dropping things to deal with notifications and so forth – that did cause interruptions, absolutely. But there was no policy mentioning “Do this” or “Don’t email after this time” and so on.” (Respondent 3)

The lack of policies was something that respondent 2 also mentioned attributing it to employees working long hours – and also making the quality of work, by the employees, suffer due to what was described as micro-breaks;

“They answer everything, all the time – meaning that they work very long days. [...] These small micro-breaks are devastating if you’re trying to have a high quality of work – you cannot focus” (Respondent 2)

Respondent 1 answered that there existed some policies, but that the policies around interruptions were mostly regarding emails, and that they were not especially adhered to, declining to specify further;

“Yeah, there is those types of policies when sending unrelated emails, but as you know, we’re only human.” (Respondent 1)

While all of the respondents acknowledged the fact that interruptions existed and that both they and the employees were affected, the respondents had a hard time thinking about how a policy could be formulated, stating that a policy would be necessary, but they did not go into detail as of how such a policy might be implemented or how it would work in practice.

4.4 Multitasking

The interview then moved onto discussing multitasking within the organizations. All of the respondents described multitasking being something common that they dealt with on a regular basis, and also something that affected the workers in a large extent. Of the managers respondent 1 reported that they were dealing with upwards to 40-50 different tasks going on related to various projects and undertakings.

A majority of the respondents reported that no policies existed in regards to multitasking or how to deal with a majority of projects going on at once. Respondent 2 reported that while stress related to multitasking was discussed amongst managers, employees that faced stress whilst voluntarily working with several projects at once would instead be removed in favor for other employees to take their spot;

“The dilemma when it comes to working with projects is the fact that there’s not a whole lot that can be done. If your ordinary work is giving you trouble, that might be a different discussion, but when it comes to projects, the manager simply pulls you from the project. And then a new employee is brought in, and
the same thing happens next week, and so on. So yeah, it's hard for the organization to do something as well.” (Respondent 2)

The respondents had hard time seeing the problem with multitasking since it had become such a regular occurrence within the organization, and when asked about whether or not any policy existed within the organization, regarding projects or the number of tasks assigned to a worker, Respondent 5 expressly stated that;

“No I don’t think so. It would never work, anyways.” (Respondent 5)

When asked in response if any complaints had been raised from the employees regarding the workload, or if there was too much for them to handle, respondent 5 stated that;

“Yeah…well… that’s something you hear all the time.” (Respondent 5)

When it came to the effects of multitasking respondent 1, 2, 3 and 4 acknowledged the stress that it meant for the employees and the problems that could arise from it, where respondent 3 discussed the negative aspects associated with employees or co-workers dealing with several things at once;

“I've seen several times where people can't handle it, and they become nasty – the result suffers and the classic thing is that everything just becomes equally bad.” (Respondent 3)

All of the respondents reported experiencing multitasking within their daily lives, but where a policy against it was something that did not exist and that weren't brought up, apart from meetings where subject 1 and 3 reported that they tried to keep them interruption free – which were more of a personal policy. After the questions pertaining to multitasking had been concluded, the respondents were thanked for their participation and the interview ended.

5. Analysis & Discussion

For analysis and discussion, the various quotes and proposed solutions from the interviews are presented and analyzed pertaining to the related research. This has been done in order to explore what the managers themselves have recommended or experienced in regards to the previously mentioned categories of information overload, interruptions and multitasking, and if any counterstrategies or methods of thinking are applicable in battling these categories. From the analysis, made by using the qualitative content analysis, three subcategories emerged for each header - where Information overload will discuss the subcategories of ‘Sending & receiving information’, ‘Emails’ and ‘Culture’. For the header of Interruptions the subcategories of ‘Categorizing interruptions’, ‘Frequency of interruptions’ and ‘Handling interruptions’ emerged. And finally, for the header of Multitasking the subcategories of ‘Categorizing multitasking’, ‘Effects of multitasking’, and ‘Handling multitasking’ emerged.
5.1 Information overload

The most common source of **sending and receiving information** amongst the respondents were deemed to be through written communication – the focus should be put on how to improve the flow of information. Properly filtering the information, as stated by Shenk (1998), is one way of lowering the strain of the individuals experiencing information overload, especially within the organization as a whole. This was a practice that was being performed by respondent 4, describing that they, when receiving the information, selected which parts that could be considered relevant to the employees and then acting upon their own ‘manual filtering’ in order to prevent the employees from getting information that were irrelevant for them to receive – as well as monitoring if the employees felt that the filtering were acceptable.

Respondent 2 mentioned the issue of a lacking structure in some cases where reports would be sent through emails, and that a policy might be necessary to address what these reports should look like. The problem in this case could potentially be that the employees are not filtering their information and therefore sending too much, or irrelevant information.

Respondent 5 stated that; while they frequently did not read emails that were CC:ed to them, they would still sometimes CC colleagues, when sending emails, to be on the safe side effectively acting against their own ‘policy’ of not really reading the emails that they were CC:ed in themselves – and in turn contradicting their personal policy.

This shows a disconnect in the individual policy where the respondent would ignore emails that they themselves were CC:ed in, yet still CC colleagues, which in turn could result in the colleagues or employees having a difficulty in distinguishing which information that is useful and which information that aren’t (Tarafdar, 2011).

One aspect that emerged from this analysis was the need for managers and employees within an organization to understand which kind of information that could be considered to be relevant. If left up to the managers that were sending information out; a “best practice” solution could yield very different results based on which manager, and also on what they themselves considered to be relevant and how their own ‘policy’ functioned.

Another aspect that proved surprising was that when asked about the sending and receiving information, most of the respondents immediately reflected upon the written information, with little regard to the verbal aspects or employees that visited them, or one another. Therefore it can be argued that an all-encompassing policy regarding sending and receiving information would be favorable, however in order for such a policy to fulfil its purpose, managers and organizations would need to be aware of the fact that information that is sent or received within organizations encompass much, much more than only the written aspect of it.

As mentioned above, several of the respondents stated that **email** were their primary source of communication. Despite this, no relevant email policies existed within their companies and where the policies existed, they were mainly tied to the signatures and the aesthetic aspects of the mail, with little to no connection to the actual content.

As stated in the result, Respondent 5 answered that they did not have an email policy – but that one was not required because the information that was being sent were seldom unrelated, and that it therefore did not cause any distractions. While the other respondents
wanted a policy, there seemed to exist a general consensus that; only unrelated information were considered to be disruptive or of an unwanted nature. This goes against research made towards emails and interruptions, stating that even so called ‘positive interruptions’ that are related to work, still produce an interruption, and that relevant information may still contribute to information overload (Van Solingen et al., 1998; Speier et al., 1999).

This is further supported by the study by Gillie & Broadbent (1989) where it was shown that longer interruptions, even related to the task, requiring memory recollection would still contribute to the disruptive effects, even if the specified problem were of an ‘easier’ nature. It is therefore important for managers and organizations to understand that just because the email being sent is related to the work task at hand, it does not exclude it from contributing to the effects of information overload.

Respondent 3 described that while the CEO of the company would rely on emails as the primary source of communication both to managers and employees, the implicit culture was that emails should not be used at all, and that it eventually came to be known as a menace rather than a tool, meaning that they only paid ‘lip-service’ to emails, but did not use it.

The analysis showed that even though a majority of the respondents were positive to the implementation of an email policy, their understanding of what could constitute as problematic emails mainly revolved around clearly unwanted emails and their effect, while less reflection was made in regards to the concept of emailing as a whole and how policies could be enacted to decrease the sending of emails in their entirety.

The argument that can be made is that proper education about both email interruptions and the role of email will be a prerequisite in order for an organization or management team to be able to properly apply any type of email policy and in order for them to understand the full extent of how emails affect both organizations and the people working within them.

When interviewing about the counterstrategies and the organizational role regarding information overload, it became clear that the culture played a larger role than initially expected, where there were discussions about culture, but also statements contradicting the culture and the respondents own policies.

For instance, despite talking about the action being taken to thwart usage leading to technostress from a managerial point of view, respondent 2 also mentioned that they themselves would stay up at night in order to work or read emails. This would suggest that even though the phenomenon of technostress was discussed within the organizations, and measures were taken in order to combat employees experiencing this stress, the implicit culture led the managers to work outside of their normal hours. This could potentially lead to a blurring of the lines between work and home, something mentioned by Tarafdar (2011) in regards to behavior leading to technostress.

Respondent 5 also mentions that when a manager from the upper management were to discuss the issue of technostress, they did so through an individualistic perspective, mentioning that they themselves would not really read emails, figuring that if something were important, they should call him instead. However, this individual policy is something that would not be viable for the employees to implement, since a majority of the customer contact were handled through emails within that organization.
The analysis shows that the culture exhibited within an organization plays a large part in how eventual policies are handled and if they are followed or not by the employees within that organization. Meaning that if the implicit culture leads managers or employees to work during the evenings or night – it signals that such behavior is present, and any policy specifying that they should not adhere to such behavior would likely be ignored.

This would mean that there has to exist a correlation between the policy presented and the practice that’s being performed, which is something supported by Brunsson & Jacobsson (1998) in their book regarding standardization, as well as by Hemp (2009) regarding policies. In such instances, it is safe to say that employees would rather look to how the explicit as well as the implicit culture is formulated and act accordingly, meaning that managers would have to lead by example, rather than pointing to policies, that they might not believe in themselves.

5.2 Interruptions

When it came to categorizing the interruptions, focus were placed on the occurrence of email interruptions. While respondents 2, 3 and 4 acknowledged that telephone interruptions, and verbal interruptions occurred, much of the discussion still revolved around the written aspect, discussing pop-ups on the mail client and usage of IM. Respondent 1 stated that they preferred to send an email as well as to verbally confirm the reception of said email, either by visiting the person that they sent it to, or through a telephone call. That was an aspect shared by respondent 5. Neither of them did however consider the verbal aspect to constitute an interruption, whereas respondent 2, 3 and 4 refrained from sending multiple interruptions. Understanding both the effects of interruptions, and what constitutes as interruptions are therefore something that would highlight and simplify the detection and categorization of interruptions, as described by Van Solingen et al. (1998) and Marulanda & Jackson (2012).

One aspect that emerged from the analysis were that many of the respondents had trouble identifying interruptions, and especially the belief that they were limited towards the usage of information technology. Failing to realize other mediums as potential sources of interruptions, showed that proper understanding and categorization is required in order to understand them.

During the interview the frequency of interruptions was extensively mentioned by all of the respondents, describing it as a common aspect within their daily work. All of the respondents experienced them to one extent or another, with respondent 2 speculating that their own day largely were filled with – attributing 75-80% of the day dealing with interruptions, albeit interruptions related to work. While the negative aspects were realized, the respondents could not formulate any policies that would combat interruptions, suggesting that training and informing the people within organizations would present the best chance of the problem being realized – as suggested by Van Solingen et al. (1998).

The analysis, showing that the problem were realized amongst all of the respondents, were interesting, but more so was the fact that none of the respondents had tried to implement a policy or any type of strategy of combating the interruptions taking place. This could be attributed to the fact that a majority, if not all, of the respondents believed the
interruptions to be something expected, rather than an abnormality, and therefore prompting them to try and alleviate the problem, rather than them trying to eliminate it outright.

When asked how the respondents went about handling interruptions only respondent 3 described that they were taking actions to prevent interruptions, by working agile and holding daily meetings with the employees. Respondent 4 described that they sometime left the office if they had to attend to something and wished to be uninterrupted. Neither of the respondents had any suggestions on how to combat interruption in an organizational sense, strengthening the argument about education in the matter and the need for further policies as described by Van Solingen et al. (1998), Marulanda & Jackson (2012) and Jackson et al. (2003).

As shown in the analysis regarding the frequency, much of the aspect surrounding interruptions was something ‘expected’, which could potentially have made it harder for the respondents to conceptualize a policy – showing that educating both managers and employees still remain a central aspect in understanding and hindering the interruptions from occurring.

5.3 Multitasking

All the respondents categorized multitasking as something that they themselves, and the employees, experienced on a regular basis. The concept proved easier to grasp than interruptions for the respondents – and all them had an idea of what multitasking entailed. Mark et al. (2005), stated that many organizations view multitasking as a basic characteristic, and the respondents were no different in their opinion – where most of them simply saw multitasking as an occurrence that was normal and therefore hard to do anything about. Understanding the broader correlation between interruptions and multitasking is therefore a major aspect, presented by both González et al. (2004) and Mark et al. (2005) that should be addressed to both managers and employees, together, in order to draw parallels between them.

What emerged from the analysis were that; while multitasking was something that all of the respondents understood, few of them connected it to the effects of interruptions where only respondents 1 and 3 had their own policies to combat multitasking. However this was only in regards to meetings. Educating employees, so that an understanding of the parallels between multitasking and interruptions is reached could therefore prove to be highly effective.

When asked about the effects of multitasking, both respondent 1 and 3 stated that it was clear how multitasking effected meetings that were attended, leading to employees not really listening and also asking questions right after the meeting that had just been talked about previously. This is something that is mentioned by Van Solingen et al. (1998), where it is specifically stated that interruptions occurring in meetings are of a particularly disruptive kind since it might affect several parties and that with many people attending, small increments of time that is lost could quickly add up to large sums from a monetary point of view. Apart from this, respondent 3 also mentioned how they had seen firsthand that both
the mood and productivity of multitasking people would suffer, an aspect described by Mark et al. (2005).

The analysis show that while the managers notice and suffer from the effects that is presented by multitasking, there is still no major incentive for them to try and combat this in any larger extent outside of the meeting room. By addressing this in the same manner in general as the managers would do if they were interrupted in a meeting – a resulting decrease is likely to occur since the problem is seldom understood by the interrupting party.

When asked about how managers were handling multitasking within their organization, many simply stated that it was something they did not really do unless it affected their own employees or if the multitasking affected them directly, such as interruptions occurring within a meeting environment. As described by Van Solingen et al. (1998) – simply addressing the problem of interruptions declined it by 30% in the organization they were researching, which arguably also decreased the multitasking itself. Respondent 1 stated that it would most often suffice to let someone interrupting know that they were being disruptive for them to stop.

While managers and employees alike are equally affected by multitasking, and the interruptions leading up to them, many of the respondents did not address these issues, showing an interesting problem, which could potentially be linked to the non-confrontational nature of swedes, or the will to not appear as someone nagging. However, the aspect of simply addressing the problem is something that both managers and employees could benefit from.

6. Conclusions & Implications

This thesis set out to explore how managers perceive technostress in their organization, and how counterstrategies, if any, were applied in an organizational sense. Through the conducted interviews, and the analysis made on these interviews, alongside the related research, it was shown that; while managers did perceive technostress such as information overload, interruptions and multitasking few counterstrategies existed, and the ones that did were purely individual in nature, where technostress was viewed as a ‘normal’ occurrence. This presents itself as a major problem where managers could reason that policies or counterstrategies does exist, while failing to realize the fact that these strategies might not work in a broader sense if they are individualistic in nature.

This raises the question whether or not these discussed incidents are isolated or if there is a deeper problem concerning organizations where managers fail to see both the severity of the situation and the changes required to combat the problems they bring with them – where an ‘it’s just how it is’ approach would be naïve since related research does show that the problem can in fact be combated through the applications of reasonable strategies.

The other aspect emerging through analysis and interviews were the pivotal role that culture played in whether or not any particular counterstrategies or policies would have a chance of succeeding, showing instances where upper managements solutions were presented as not answering email – or in other cases the upper management emailing in the middle of the night. The interviewed middle managers themselves pushed on the importance
of disconnecting while almost all of them were working from home both before and after their actual working hours, signaling an implicit culture of such behavior being condoned, even if they did not condone it themselves.

This highlights an important issue – partly that technostress is not going to go away any time soon but also the fact that if the problem is not addressed on an organizational level - as well as a cultural level, the upcoming reports on work-related stress from Arbetsmiljöverket will most certainly not improve, reflecting both on employee well-being and organizational revenue. It is worth noting that the results shown in this research are not generalizable on organizations as a whole, but rather that they should serve as a guideline and raising the question if this behavior and mindset exists within other organizations as well, and the necessity of future research in order to determine if that is the case.

The implications for future research shows that cultural factors play a larger role than what was expected when this thesis were in its infancy. While much of the research focus on an individual aspect, with some – but few – research articles being written taking the organization into account, this thesis will hopefully persuade academics of the potential to look at the aspect of organizational culture that needs to be addressed before any counterstrategies or policies can be considered.

The implication for practitioners is the fact that this thesis provides a condensed and summarized view on the aspects of information overload, interruptions and multitasking – highlighting their importance and the negative effects that are related to them. This allows for practitioners to understand the challenges associated with them, but also the dangers that are associated with not understanding or dismissing these aspects – as well as the long term effects that they can, and will, have on an organization if not properly addressed.

7. Acknowledgements

I want to direct my deepest thanks to my supervisor Rikard Harr. Without your support, help and insight, this thesis would not have been possible to write, and I would not have known which direction to go. Thank you very much!

I also want to extend my thanks to:
My mom and two brothers (despite my brothers’ inability to admit to the inferiority of their woodwork butter knives, when compared to mine. Quality before quantity).

To Burrbaz, for the pointers and camaraderie that was given throughout this thesis.

To my friends in ‘The Lazy Squad’; for all the fun times and for allowing me to experience interruptions first hand.

To my good friend Jonas J; because we both know that this is the only time that your name and a master’s thesis will ever be related.

And a big thank you to all the anonymous respondents that participated and made this thesis possible, your participation was truly invaluable.
8. References


Appendix 1: Interview guide

Hello, my name is Viktor Mähler and I’m currently writing my 1-year master thesis in IT-management for Umeå University. My thesis regards the phenomenon of information overload and how that can affect managers as well as employees within organizations, in order to ascertain how this is handled by managers and organizations alike. I have identified three factors and the purpose of my interview is to receive an input from managers in order to understand if these factors are present within your organization and if you, or your employees have experienced these factors.

The interview is expected to last about 30-60 minutes and your participation is completely voluntary where you may discontinue the interview at any point or decline to answer any questions that you deem to be uncomfortable, either during the interview itself or in a later stage. As the interviewer I will not share any of your information to a third party without your expressed consent and everything that you say will be anonymized so that neither you, nor your place of work, can be identified within the thesis itself.

With your permission this interview will be recorded with the sole purpose of transcribing and coding the interview, and the recording will be deleted as soon as the transcription of the interview has been completed. No names will be present on any of the documents or material that can be connected to you.

Thank you for your participation!

Background

Describe a bit about the work tasks that you have within your organization, what are common tasks, and do you have any employee responsibilities?
How long have you been active within your line of work, would you describe yourself as a junior or senior within your field of work?
What management-level would you describe yourself as having within your organization?
How would you describe your computer knowledge?
How would you describe the computer knowledge amongst your employees?

Information overload
Describe how you receive information within your work environment.
- How do you experience that it is working?
- Do you have any ability to regulate this information?
- Would you describe this information as manageable?
Describe the most common ways for you to send out information to your employees or colleagues within your work environment?
- How do you experience that it is working?
- Do you feel that it can be improved in any way?
- How does the employees feel that it is working?

Do you experience any changes within your organization/branch when it comes to the handling of information today compared to how it was handled earlier?
- Do you experience any difference in sending information, (if yes) describe.
- Do you experience any difference in receiving information, (if yes) describe.

Do you know if there exists any policies within the organization when it comes to sending out information to employees/colleagues/customers?
- (If yes) How is this policy formulated?
- (If yes) What is your experience with this policy, what works and what does not work?
- (If no) Do you believe that a policy would be necessary within your work environment? Describe.
- (If no) Do you have any thoughts on what such a policy might look like?

Have you or any employee/colleague felt an overwhelming stress regarding incoming or outgoing information or being connected?
- (If yes) Is that something that have occurred more than once?
- (If yes) Has it affected anyone else within the organization?

What type of support is available for people suffering from techno-related stress within the organization?
- Would you describe your organization as aware of technostress?
- What is the view of your manager in regards to technostress?
- Is technostress something that is discussed within the organization?

What is your opinion when it comes to the individuals’ responsibility compared to the organizations responsibility in regards to combating technostress?
- How much is it the individuals’ responsibility compared to the managements’ responsibility when combating information overload?
- Do you take any precautions to combat information overload?
  - (If yes) Which? Describe.
  - (If no) Do you feel a need to? Describe.
- Do you take any precautions to combat information overload affecting employees or colleagues?
  - (If yes) Which? Describe.
  - (If no) Do you feel a need to? Describe.
Appendix 1: Interview guide

**Interruptions**

Describe how employees/colleagues usually go about when contacting each other within the organization.

- Are any medium, more common than others when it comes to contacting each other within the organization (Such as email, telephones, instant-messages, face-to-face visits, etc.)
- Do you feel that you have the ability to respond to requests or incoming messages within a reasonable timeframe?
- Is there any prioritizing being made when responding to contacts made to you from your colleagues?
- (If yes) How does this prioritizing work?

Are there any policies within your organization when it comes to dealing with interruptions occurring within your organization?

- (If yes) What does this policy entail?
- (If yes) How is this policy practiced by the employees?
- (If no) Would you say that a policy is necessary within your organization?
- How do you go about to avoid interruptions from happening to you?
- How do you go about to avoid interruptions from happening to your employees within your organization?

How many emails would you estimate that you receive within a normal day?

- How long would you estimate that you spent reading and responding to these emails during a normal day?
- Do you implement any system when handling these emails?
- Do you feel that you need to respond to an email as soon as you receive it?
- Do you experience that you have the time to handle the communication that is required of you?
- How many of the emails that you receive would you describe as being critical in order for you to perform your work?

Are there any policies regarding emails within your organization?

- (If yes) What does this policy entail?
- (If yes) How is this policy practiced by the employees?
- (If no) Would you say that a policy is necessary within your organization?
- Do you have any ability to affect the policies within your group or your employees?

How often would you estimate that you experience interruptions during a normal day?

- Regarding non-critical emails?
- Regarding non-critical phone calls?
- Regarding questions from employees that were non-critical?
Appendix 1: Interview guide

- How much of your day would you say is spent on handling interruptions that occur?

**Multitasking**

How often do you work with multiple projects or tasks at once?
- How do you prioritize when working with multiple projects or tasks at once?
- What is your experience from working in such a way?
- Do you prefer to multitask or solve one issue at a time? Why?

How often does employees work with multiple projects or tasks at once?
- Do the employees have any issues regarding the workload?
- Is there any policy about the amount of projects or tasks an employee can be involved in at once?
- (If yes) What does this policy entail?
- (If no) Is there any complaints from the employees being raised about the workload?
- How much insight do you have regarding the workload of the employees within your organization?

Are there any policies regarding multitasking (Such as blocking of social media, or certain guidelines when it comes to meeting)?
- (If yes) What does this policy entail?
- (If yes) How is this experienced by employees within the organization?
- (If no) Do you feel that a policy regarding multitasking would be required within your organization?
- Would you say that multitasking is a problem within your organization? Describe.

**Other**

Do you have any questions about this interview or regarding the thesis?
Do you have anything you might want to add to the interview that you feel I’ve missed in the questions?