



## 'Dealing with My Emails': Latent user needs in email management.

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### ABSTRACT

Email is a communication channel that provides a number of benefits. It can be stored, retrieved and forwarded. It also allows a recipient to choose when to uptake communication and how to pace it. However, email also incurs one prevalent cost: the feeling of email overload. One of the reasons leading to that feeling lays in the fact that current email clients do not provide an inbox structure that facilitates email prioritization, information structuring and work-flow management. The goal of this study was to understand the latent user needs regarding handling emails. We identified six such needs: three pertaining to email organization (email annotation, reliable structure and no urgency to classify) and three related to email retrieval (informative overview, flexible sorting and efficient search). We further investigated the dominance, importance and dependencies between these needs. The results were then discussed and implications for future inbox design were proposed.

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### 1. Introduction and related work

In the last two decades email has become an integral means to communicate in the professional and private worlds. A great success of email as a communication channel can be related to a number of unique characteristics such as being asynchronous (Thomas et al., 2006), textual (Tyler & Tang, 2003), shared (Dabbish & Kraut, 2006), traceable (Clark, 1996; Monk, 2003), instantaneous (MacKay, 1988) and efficient (Renaud, Ramsay, & Hair, 2006). Email popularization, however, has also brought about a large disadvantage pertaining to the amount of the instantaneously obtainable information: the feeling of *email overload*.

The term *email overload* initially referred to the many different functions that email was employed for: a calendar, a ToDo list, a data archive, and a contact list (Bellotti, Ducheneaut, Howard, & Smith, 2003; Whittaker, 1996). Since then, the term *overload* has been broadly reinterpreted as the feeling of being overwhelmed by a large volume of incoming messages (Dabbish & Kraut, 2006; Eppler & Mengis, 2004; Jackson, Dawson, & Wilson, 2001; Venolia, Dabbish, Cadiz, & Gupta, 2001; Whittaker, Bellotti, & Gwizdka, 2007; Whittaker, Bellotti, & Gwizdka, 2006).

The feeling of email overload arises from the fact that an incoming email requires from the recipient to decide when and how to deal with its content (Fisher, Gleave, & Smith, 2006; Neustaedter, Brush, Smith, & Fisher, 2005; Renaud et al., 2006; Tyler & Tang, 2003). People tend to monitor their mailboxes even though they realize that each message produces an interruption and is likely to make them feel even more overloaded. Those, who decide to

either turn them off or only periodically check emails tend to experience ever higher overload as they are exposed to situations in which many emails require their immediate attention (Dabbish & Kraut, 2006; Jackson et al., 2001). The underlying cause, among other factors, regards the fact that email clients do not fully support the users to effectively and efficiently manage their inboxes (Fisher et al., 2006; Tyler & Tang, 2003; Whittaker et al., 2006).

Whenever attending to an email arriving in their inbox, there is a number of activities the users need to perform (Siu, Iverson, & Tang, 2006; Thomas et al., 2006; Tyler & Tang, 2003; Whittaker, 1996, 2006, 2007). Once a new message pops up, the user assesses, based on the immediately visible message characteristics like the sender and the subject line, whether and when it should be attended to (right away, at a later moment or not at all) (Siu et al., 2006). After getting acquainted with the content of the message, the user once more reevaluates the initial decision regarding the action on email (Whittaker et al., 2007). Many emails cannot be discarded in a single session; they might require multiple actions as well as input or decisions from others (Thomas et al., 2006). For example, a seemingly simple request such as 'could you, please, prepare a short update about project A?' might require from the recipient to gather data from multiple people who may not necessarily be immediately available, get acquainted with the provided information and compile it in a form of a concise response. In such situations, the users need to manage their email-related tasks by constantly checking their status and reacting to it accordingly (Menchik & Tian, 2008; Tyler & Tang, 2003). Finally, messages that no longer need to remain in the inbox can be archived. Archiving decisions also are complicated because emails can be related not only to multiple communication threads but also to other documents located outside the mailbox (Whittaker et al., 2006). For that

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reason many people tend to leave messages in their inbox, which then increases the level of difficulty regarding finding the relevant message (Bondarenko & Janssen, 2005; Mackay, 1988; Malone, 1983).

All these actions that the users need to perform when dealing with emails contribute to the feeling of email overload. This feeling is further alleviated by the fact that the current email clients only begin to offer mechanisms to support people in their email management (Dabbish & Kraut, 2006; Dredze, Lau, & Kushmerick, 2006; Dredze, Wallach, Puller, & Pereira, 2008; Dredze, Schilit, & Norvig, 2009; Horvitz, Koch, Kadie, & Jacobs, 2002). For example, Outlook offers elaborate means to mark email priority and to view messages according to their due date. Gmail™ automatically threads messages with the same subject line. Gmail™ also enables message labelling and starring to further support grouping and sorting of related emails. Recently Yahoo made an attempt to automatically prioritize incoming messages based on the importance of the sender and also on the frequency of email exchange. These are the first steps but more needs to be done in order to truly help people dealing with email overload. Therefore, the goal of this study was to investigate the latent user needs regarding email handling practices in order to propose implications for the design of future inbox mechanisms that could address that challenge.

## 2. Study

### 2.1. Participants

A total of 16 persons (8 male, 8 female; 8 from the academia, 8 from the industrial environment) volunteered to participate in the study. Participants were 25–52 years old. We solicited the representatives from a group of so called knowledge workers from two different professional environments and of different age. We did so to obtain a broad perspective regarding user needs pertaining to email management and to avoid bias caused by the analysis of the data collected from only one type of setting and one user group. All participants worked in the research environment and were involved in two or more projects. Their tasks included carrying out research work in collaboration with other partners (often coming from the external companies or research groups) and also managing the progress of the projects (or the tasks they were responsible for within the projects). Therefore, email was considered by them as a very important means to communicate with other team members, and also as a way to distribute and share project-related information.

The decision behind choosing participants from two different research environments was initially motivated by the assumption that the perception of email communication might differ depending on the amount of external collaboration. However, in the course of the study we saw that there was no clear distinction between both groups and that both their ways of using email and their needs were similar. Therefore, the analysis of the collected data was conducted without distinguishing between these two groups.

Before the study participants were asked to fill out a demographics questionnaire requiring about their email handling habits. These habits were identified based on participants' inbox status assessed and averaged for the last month. The questionnaire results revealed that Microsoft Outlook™ was the most often used as a primary email client (12 participants). The remaining 4 participants used Gmail™ as their primary email client. Out of the 12 participants using MS Outlook™, 8 were using Gmail™ as their secondary email client. They were also familiar with other email clients such as Yahoo™, Hotmail™, MacMail™, OperaMail™, Thunderbird™ and Lotus Notes™.

The majority of participants (10 out of 16) reported to have a relatively large inbox (Mackay, 1988; Whittaker, 1996) (100–2000 emails) while six had an inbox consisting of approximately 20 emails. The average number of folders was reported to be 32 (stdev = 54.2). The average number of emails received per day equalled 17 (stdev = 7.9) and the average number of sent emails was 9 (stdev = 7.2). The participants reported that out of all emails they received, on average 4 emails required just a response without any additional action involved (stdev = 3.1); approximately 5 required an additional action before responding (stdev = 3.1) and about 8 did not require any action at all (stdev = 7.1).

### 2.2. Data collection

We aimed to stimulate participants to define their needs based on their personal experiences rather than on global beliefs regarding the 'ideal inbox design' (Schwarz et al., *in press*). For that purpose we wanted to utilize the content of the inbox each participant was currently managing. Participants were requested to take a snapshot of their inbox one hour prior to the planned interview and send it to the author of this article. The snapshot was then printed in three copies. The emails visible on two printouts were cut out (see: Fig. 1). The third snapshot was kept as a reference.

The interview lasted about 1–1.5 h. First, each participant was presented with one set of cut-out emails at the time and asked to envision and describe an ideal inbox according to the following criteria:

- First, participants were asked to illustrate an inbox structure that reflected their personal preferences to organize and retrieve emails.
- Then, participants were asked to illustrate another inbox structure that reflected the importance of different emails and enabled them to easily distinguish among messages.

The first exercise employed the *free elicitation* technique. The main advantage of free elicitation is that it allows the users to describe the artifact in terms that are salient to them rather than react to the criterion predefined by the researcher. In such a way it offers a means for spontaneous expression of participant's opinions and preferences that are unbiased by the underlying research question (Reilly, 1990).

The second inbox structure aimed to deepen the understanding regarding the need for email organization according to the perceived message priority, which was mentioned in the related literature as an important factor in dealing with email overload (Bondarenko & Janssen, 2005; Dabbish & Kraut, 2006; Mackay, 1988; Renaud et al., 2006; Siu et al., 2006; Whittaker et al., 2007). Therefore, we have prompted the participants to consider the relative differences between emails' importance and describe the impact on this factor on the way messages might be positioned in the inbox.

Participants could take as much time as necessary to think about the ideal inbox structure and then they were asked to start organizing the messages according to that envisioned structure. During the visualization process, participants were required to think-aloud (Nielsen, 1992) and describe both the way they were grouping the messages and also the functionality that could potentially support them in that process (see: Fig. 2).

After both inbox structures were visualized and described, the Repertory Grid Technique (RGT) was used to elicit the latent user needs regarding the preferred inbox design (Honey, 1979; Kelly, 1991). The participants were asked to compare the three inbox structures (two that were in the previous step created by them and the current inbox structure represented in the form of the third untouched copy of their inbox structure) presented to them

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