Email Land – An Exploration of Email User Interfaces Supporting Pending Tasks

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Abstract

Management of pending tasks is one of the activities commonly performed in email [12]. Current email programs, however, were designed to support asynchronous-communication-with-immediate-action (e.g. response to a message immediately after it's read). They do not provide adequate support when actions are delayed. This research explores how to better support pending actions in email and explores alternative solutions that use different external representations and interaction techniques with messages and associated tasks. In a recent study we compared the effects of two email user interfaces (a typical tabular inbox and a 2D grid containing explicit temporal information) on efficiency and effectiveness of task information retrieval from email messages. We found that the latter interface was overall faster for finding information related to task dates, time and task overviews, while the inbox interface was faster for finding information from subject lines, senders or from the message body. We are currently designing and implementing a new prototype email user interface (Email Land), where users will be able to create their own visual organization of messages on a 2D plane. The interface is based on ZUI.

Keywords

Email interface, task management, prospective memory, external representation, zoomable user interface (ZUI).

1. Introduction and motivation

Previous research [7,8] has recognized the widespread use working and ephemeral information in physical environments and in desktop systems. The main characteristic of working and ephemeral information is their relation to on-going and pending tasks and a relatively short lifespan, which does not justify creating elaborate organization schemas. People often rely on location information to organize and find these types of information [4]. While our physical environments support location-based retrieval reasonably well, the desktop systems provide a rather limited support.

Email messages are one example of documents that are used to carry working and ephemeral information and pending tasks. These messages are quite commonly kept and managed within email inboxes and folders [5,6,12]. Current email programs, however, were designed to support asynchronous-communication-with-immediate-action (e.g. response to a message immediately after it's read) and do not provide adequate support when actions, due to constraints of various nature, are delayed.

2. Related work

A number of email systems have focused on message categorization. While email classification is important, there is often no clear sense what user task is being supported. Several systems have focused on supporting the "original" email task – asynchronous communication, for example, by combining visualization of conversational threads with timelines [10] or by providing relevant context for reading and composing messages. Other research explored contact-centered management of conversations [11] and alternative placement of messages employing a pile metaphor to support tracking of tasks in email [1].

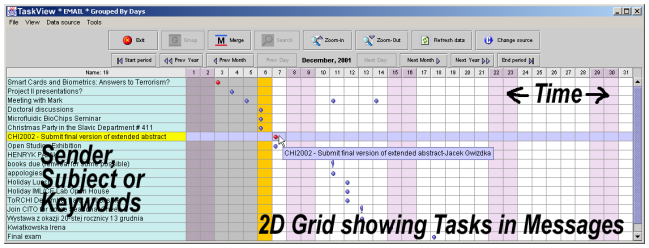

Figure 1. TaskView interface (based on TimeStore[12]). Shown is monthly view with pending tasks sorted by time.

3. TimeStore-TaskView user interface

Time is inherent in the management of pending tasks. Email messages may contain multiple references to time; the two most common references are: message *arrival* time and message *reference* time. The message arrival time is always in the past, while messages can refer to the past, the present, or the future. These two timelines are embedded, explicitly or implicitly, in email messages. The TimeStore-TaskView system (Figure 1 - based on TimeStore [13]) uses the latter timeline. In TimeStore-TaskView, tasks embedded in messages are represented by small icons on a two-dimensional grid with temporal and other task information shown on the horizontal and vertical axis, respectively. Other task attributes include sender, subject, or keywords extracted from message body (user selectable). Navigation back and forward in time is provided. Displayed time period can be between one day and one year.

Message body can be viewed by double clicking on the corresponding task icon.

4. User study

A user study was conducted to examine the proposed visualization of pending task as implemented in the TimeStore-TaskView interface (Figure 1). A typical email inbox (Microsoft Outlook) served as a benchmark email interface). Messages used in the study contained pending tasks. The subjects' task was question-driven information retrieval from messages. The questions were categorized into "content" questions, which referred to subject, sender, or content; and "date" questions, which referred to date, time or task overview. The TaskView interface was found faster for the "date" task, while the Inbox interface was faster for the "content" task. Three significant interactions between the UI condition or the task and individual differences (as measured by tests of cognitive abilities: VM -visual memory, STM-short-term memory, FC-flexibility of closure) were also found. Figure 2 summarizes the results.

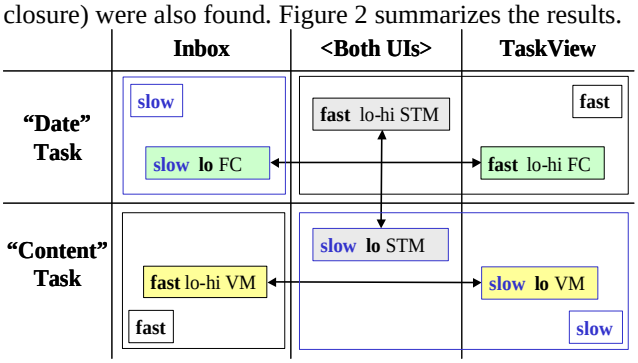

Figure 2. Significant differences in performance time showing interactions between: UI or task and individual differences.

5. New Email Interface

Spatial memory has been shown to be effective in the management of documents in desktop environments [9]. We suggest that it can also be used effectively to manage email messages containing pending tasks. By using location-based organization of messages users avoid the expensive process of creating, naming and managing folders.

We are currently designing and implementing a prototype email UI, where users will be able to create their own visual organization of messages on a 2D plane. The interface is based on Zoomable User Interface [2]. Figure 3 shows the prototype implementation in Java.

6. Summary

Email messages containing future reference are handled poorly in current email systems. This research examines how external representations of task information at the user interface can improve management and awareness of pending tasks that are encoded within email messages. The physical environment, in which people perform everyday activities, is highly spatial and flexible. We expect that bringing some of these characteristic into the email environment, will better support a variety of tasks performed in email.

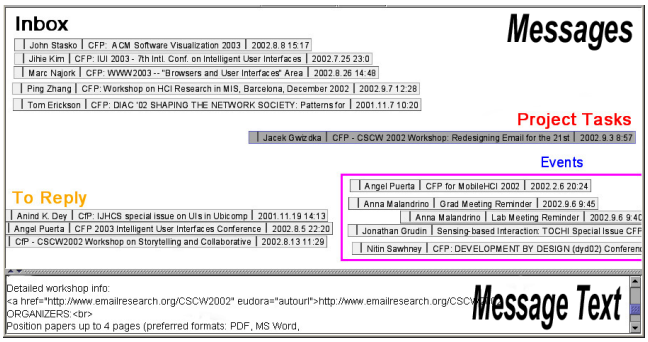

Figure 3. Email Land – new prototype email interface.

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