

Cognitive Abilities, Interfaces and Tasks: Effects on Prospective Information Handling in Email

by

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Abstract

This dissertation is focused on new email user interfaces that may improve awareness and handling of task-laden messages in the inbox. The practical motivation for this research was to help email users process messages more effectively.

A field study was conducted to examine email practices related to handling messages that refer to pending tasks. Individual differences in message handling style were observed, with one group of users transferring such messages out of their email programs to other applications (e.g., calendars), while the other group kept prospective messages in email and used the inbox as a reminder of future events.

Two novel graphical user interfaces were designed to facilitate monitoring and retrieval of prospective information from email messages. The TaskView interface displayed task-laden messages on a two-dimensional grid (with time on the horizontal axis). The WebTaskMail interface retained the two-dimensional grid, but extended the representation of pending tasks (added distinction between events and to-do's with deadlines), a vertical date reading line, and more space for email message headers.

Two user studies were conducted to test hypothesized benefits of the new visual representations and to examine the effects of different levels of selected cognitive abilities on task-laden message handling performance. Task performance on both of the new visual interfaces was faster than on the more traditional textual interfaces, but only when finding date-related information. Selected cognitive abilities were found to impact different dependent measures. Working memory and flexibility of closure had effects on performance time, while visual memory and working memory had effects on user interactions involving manipulation of the visual field, such as scrolling and sorting.

This research contributes to understanding interactions among cognitive abilities, user interfaces and tasks. These interactions are essential for developing two types of interface: inclusive interfaces that work for users with a wide range of cognitive abilities, and personalized and adaptive interfaces that are fitted to individual characteristics.