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ReMail: A Reinvented Email Prototype

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ABSTRACT
The Collaborative User Experience research group has been investigating how people use email and how we might design and build a better email system.   In this demonstration, we will show a prototype email client developed as part of a larger project on "reinventing email."   Among other new capabilities, this integrated prototype incorporates 1) novel visualizations of the documents within mail databases to aid understanding and navigation, 2) advanced text analysis of the content of email messages, and 3) several unique features for helping users manage their attention.

Keywords
Electronic mail, information visualization, text analysis, attention management.

MOTIVATION
Electronic mail has become the most widely used business productivity application, yet many people are frustrated with their email. They are overwhelmed by the volume (receiving hundreds of messages a day is not atypical [4]), lose important items (folders fail to help people find and recall messages [7]), and feel pressure to respond quickly (often within seconds [2]).   Though email usage has changed, our email clients largely have not [1].

We have been investigating email through user observations and interviews, design mockups, prototype implementations, and user evaluations. A major goal of our prototyping efforts has been to explore the value of integrating a number of new features and technologies and then observing how people use the prototype on their own email.

VISUALIZATIONS
Thread Map
Our prototype supports threads of email messages by providing a visualization of the thread tree when any message is selected [3, 5] (Figure 1).   The currently selected node is highlighted with blue as are the arcs to its parent and children. Unread messages are indicated with a bold, black border. Messages that the user has sent are hollow.

Figure 1. Thread Map visualization

The oldest message is drawn on the left. Our design maintains compactness with either deep or wide trees while clearly displaying chronological order. Hovering over a node provides summary information including the first line of the message body, and clicking on a node causes that message to be opened in the preview pane.
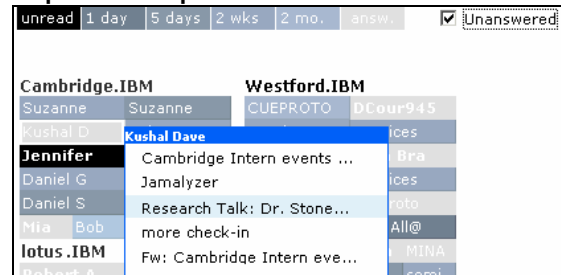
Correspondent Map

Figure 2. Correspondent Map visualization

The correspondent map groups messages in a folder by sender [5] (Figure 2).   Senders are grouped by their domain.   Within a domain, people are ordered by the number of messages they have sent. If there are many senders, the rectangles representing senders are reduced in size and may only show first names or initials. The color of a rectangles indicates the age of the most recent message from that sender. Selecting the "unanswered" check box grays out the rectangles of those to whom the user has sent mail more recently than they have received it.

Message Map
The message map allows the user to quickly see relationships among messages in a folder [5] (Figure 3). Messages are drawn as rectangles in chronological order. The selected message is drawn in dark blue and other messages in the thread are drawn lighter blue. Other visual attributes can surface information of interest to the user. In the figure, for example, messages with an orange border have the same author as the selection and messages with a "dog ear" are unread (these settings are customizable). If a

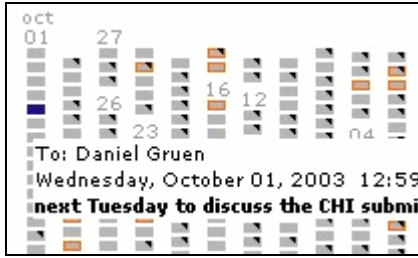message is not selected by a user's search, its rectangle is drawn as a lighter "ghost."

Figure 3. Message Map visualization

TEXT ANALYSIS
Date Extraction
Recognizing that many email messages discuss dates and times in an informal way (e.g., "let's meet next Monday"), we have implemented a system to identify date and time phrases that appear in the bodies of email messages, parse these phrases to determine their meaning using the context of the message, and surface messages to the user, both automatically when looking at relevant dates and by allowing date-based search [6].
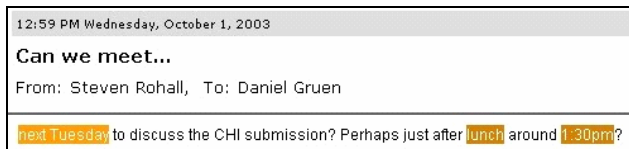

Figure 4. Highlighting discovered dates and times

Date and time phrases are indicated by hoving over a message in the list view and by highlights in the body of the message (Figure 4). A single click allows the user to make a formal calendar entry out of a discovered date and time.

Thread Summarization
Email threads are a key component of the ReMail prototype. The message list view displays the number of messages in the thread to which any message belongs (see the numbers "4" and "6" in Figure 5). Hovering over this thread count displays a textual summary of the thread. The summary is created by extracting the first line of each message. While more complex algorithms could be used, this very simple technique has proven remarkably useful.

Figure 5. Highlighting threads in the list view

Collections
The ReMail prototype incorporates an advanced foldering concept called "collections." Like traditional folders, the user can manually move messages into or out of a collection. Unlike folders, a message can belong to multiple collections. Also, like traditional filtering rules, messages can be automatically sorted into collections using

queries. These queries can be quite arbitrary (e.g., "is 'CHI' mentioned anywhere in the message").

ATTENTION MANAGEMENT
"In-sight" and "Out-of-sight" Collections
An important capability of a collection is for it to be "in-sight" or "out-of-sight." If a collection is out-of-sight, then messages in that collection are removed from the default inbox view. In this way, less important messages can be removed from the inbox and the remaining inbox messages command more of the user's attention.

User Interface Highlighting
Highlighting is used in a number of places in the user interface. In the message list view, the selected message is highlighted with dark blue while the other messages in the thread are highlighted with a lighter blue (Figure 5). If the message is in more than one collection, each of these collections is also highlighted. Finally, selecting a message in any available view (e.g., list view, thread map, correspondent map, and message map) selects the message in all views and opens the message for preview.

Multiple Data Sources
Much of the information people need to do their jobs is scattered among different data sources. Our current prototype reads Lotus Notes email, POP3 and IMAP email, NNTP news groups, RSS feeds, and Lotus Quickplaces. Messages from any source can be in any collection and accessed using any of the visualizations and tools described above.

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