

The Design and Evaluation of a Multiple Views Email Browsing Tool

Saad Alharbi, Dimitrios Rigas

S.T.Alharbi@Bradford.ac.uk, D.Rigas@Bradford.ac.uk

Department of Computing, University of Bradford, BD7 1DP, Bradford, UK

With the vast growth of the internet and the spread of computer technology, electronic mail (email) has become one of the easiest ways of communication amongst people. It is being used daily in our life and it has been stated that most people check their emails several times a day [1]. Furthermore, Email was called as habitat since most of computer users spend most of their time checking emails [2]. Consequently, the number of messages exchanged by email is rapidly increasing especially that most email users keep their messages for future use.

In general, two types of email systems are being used nowadays: web based email systems such as Yahoo and standalone email clients such as Microsoft outlook. Most of email software in the two types display email messages textually using a chronologically ordered list. Email messages that are not displayed in the focus region of the inbox due to the large amount of archived messages can be found by sorting messages according to the required properties such as date, sender and subject. For example, email messages must be sorted by date to find an email message sent two months ago and the inbox should be scanned until the required message is found. Furthermore, one of the most frequently used scenarios for finding email messages in most email software is using the conventional search feature where the required information of the message must be entered manually in the search fields. However, this task has become difficult and time consuming especially with the rapid growth of email messages.

Many studies have been carried out to improve email performance. However, most of these studies focused only in employing new features with email such as task management features as well as developing email tools for specific group of people (e.g. people in work). Nevertheless, the usability of finding email messages in a large email inboxes has not been significantly considered. In an effort to address the usability problems of browsing email messages using the common email data such as date, sender and subject, an experimental email tool was developed which called LinearVis II. This tool was developed based on the results of a previous experimental study [3] [4] [5]. It was composed of multi coordinated views where users can access email messages at a glance from the main view. These views are: main view, dateline, senders' list, temporal view and attachment panel. . Email messages are presented in the main view of LinearVis II textually in a similar way of most representative email clients. However, it shows email messages that were received in the same month only clustered by days. For example, if email messages were received in only 5 days of a particular month, the main view will presents these messages in five chunks based on the day each message was received on. Messages received on the latest month of the current year will be displayed in the main view when LinearVis II is started. If no message was received on this month, email messages of the previous month will be displayed in the main view and so on. Days' chunks are presented chronologically in the main view where the top chunk represents the most recent day and the one located in the bottom is the oldest. Moreover, messages are displayed chronologically in the days' chunks and the attributes of messages are presented in the conventional way used in most email clients.

In order to facilitate the navigation through email messages using the date, a dateline was designed and placed at the top of LinearVis II inbox. The dateline of the previous version (i.e. LinearVis) was composed of days which required users to perform long scrolling to locate messages by date. Therefore, the length of the dateline in this version was reduced by only presenting the months of the current year in a chronological order. Moreover, a dropdown menu that cantinas previous years was placed at the left corner of the inbox. By clicking on one of the buttons that represents months in the dateline without selecting a year from the dropdown menu, the content of the main view will be changed to present email messages received on the selected month in the current year. Whereas, to find email messages received in a previous year the required year should be selected first and then the required month can be clicked.

One of the most important features of LinearVis II is senders' List which located in the left side of the inbox. It was developed in order to help users finding email messages by senders' names or email addresses. In a similar way of the previous version, the sender's full name will be presented in the list if it was found in the email server otherwise the email address will be presented instead. Senders are ordered by the number of email messages they have sent within the last month. This approach can help email users finding messages belonging to most active users easily. However, locating messages that belong to less active email users such as those who have sent one message within the last month will become difficult. Therefore, Senders look up feature was implemented in the senders' list to find messages sent by less active senders easily.

Sometimes email users search for files attached with messages rather than searching email messages themselves. For instance, a project member can search for the file contains the project timetable which was sent by the project manager irrespective in which email message was attached to. An attachment panel was developed in LinearVis II in order to facilitate the accessibility of documents and files that were exchanged by email. It is directly synchronised with the senders list. Therefore, when a sender is selected all attachments that sent by this sender will be displayed in the attachment panel. One of the new features that were added to LinearVis II and was not implemented in the previous version (i.e. LinearVis) is the instant subject search. It was designed to help users finding email messages by subject easily. Therefore, a text field was located at the top right corner to facilitate this task. The content of the main view changes to a list view presenting the relevant email messages according to the text being typed in this field.

A comparative usability evaluation was conducted between LinearVis II and a typical email client. This evaluation was carried out to investigate whether the usability of browsing email messages can be improved in LinearVis II when compared to typical email clients. Thirty users were recruited in this experiment. All of them were undergraduate students doing a bachelor degree in computer science. Moreover, they were all male and aged between 18 – 25 years. They were required to perform twelve experimental tasks, in each task users were asked to find the required email message with the provided relevant information. The same email inbox that contained 921 real email messages was used in both conditions. Each user was asked to fill post-experimental questionnaire at the end of the experiment in order to obtain their views and opinions regarding the experimental conditions. It was 1 to 5 Likert rating scale with 10 statements. It consisted of three sections; the first section contained four statements regarding the layout of the experimental conditions and the ease of use. The second section contained five statements regarding the usefulness of finding email messages in each experimental condition. The last section of this questionnaire included one statement about the overall users' satisfaction over each experimental condition. The obtained data was analysed in two independent ways. First, the score of each statement in the questionnaire was added together to produce an overall satisfaction score for each user. The mean value of satisfaction score in the control condition was 26.93 where it was 42.47 in the experimental condition (i.e. LinearVis II). Paired t-test was used to test whether this difference is significant. The results indicated that LinearVis II was significantly more satisfactory than the control condition ($t_{29} = 16.41$, $cv = 1.61$, $p < 0.01$). Each statement in the questionnaire was analysed independently in the second way. Wilcoxon Signed Ranks test was performed on the satisfaction scores of each statement in order to test the difference between both experimental conditions. The results also showed that users were significantly more satisfactory with all statement in LinearVis II when compared to the typical email client.

In conclusion, the experimental results showed that the multiple coordinated views in LinearVis II improved the usability of browsing email messages using the common email properties such as date, senders' details and subject. For instance, observations showed that grouping showed that users found locating messages by date using the dateline is significantly easier than the typical sorting process. Statistical also results showed that users found locating email messages using the senders' list is significantly easier than the conventional way used in the standard email. Most users also found that the identification of To, CC in LinearVis II is easier than the standard email. This result was statistically significant. Since the temporal view was found effective for presenting such information it can also be utilised to present more email data which can also improve the accessibility to email messages such as threads. One of the novel components in LinearVis II is the attachment panel. The results indicated that finding attachments in LinearVis II is significantly easier than the standard email. The classification of attachments according to files types was found very effective for accessing the required files. Hence, the size of application icons in this panel can be reduced to add more files types such as video and image files.

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