ClearContext Inbox Manager™ for Microsoft Outlook®:
Designing a More Effective Inbox

ClearContext Corporation
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> *"Email is the killer app; it's killing me."*
> - ClearContext survey respondent

ABSTRACT

The problem of email overload has been documented in the popular press, studied by research institutions, and experienced by corporate users who feel they have too little time to address too many emails. In this paper, we present findings from our research on the issue as well as a detailed description of our solution to the problem. The ClearContext Inbox Manager™ for Microsoft Outlook® utilizes proven design techniques to present a prioritized, threaded inbox with enhanced filing capabilities; assisting the email user in coping with high volumes of messages. In the future, we will present the results of a field study on the effectiveness of the application.

KEYWORDS

Email, electronic mail, asynchronous communication, personal information management, task management, computer-mediated communication

EMAIL SURVEY RESULTS

Virtually every corporate user has, at one time or another, felt overwhelmed by large volumes of email. Since email's inception, there have been numerous studies analyzing the problems inherent in common messaging applications and proposing solutions to help ease the email burden. Most of these studies have concluded that, for email applications to be more effective, they must provide better context for messages as they are received.

For our study, we conducted interviews with 50 high volume email users from various job functions to gain insight into their use of the "killer app." 92% of our group were Microsoft Outlook users. Of those, 61% run Office 2000 and 38% use Office XP. About 47% reported utilizing corporate Microsoft Exchange servers for their mail service, 39% utilized POP3, and the rest accessed mail via IMAP. Most of those interviewed are employed in the high tech industry in the San Francisco Bay Area and should be considered email "power users."

The Problem with Email

Over the last 20 years, email has replaced the telephone as the primary communications vehicle for completing business in North America. One 2000 study found that 97% of workers in the United States and Canada report that they use email, at a minimum, several days a week. In fact, those users stated that they preferred email as much as five times more than other modes of communication.[1] A typical corporate user receives 81 and sends 29 email messages a day. This represents an 80% increase over the previous year's numbers. In our 2003 survey the average number of received emails per day was over 100. Surprisingly, according to research, the bulk of this increase in email messaging is not due to unsolicited email such as spam, but rather to the business community's increasing reliance on email as a primary communications tool.[2] It is because of this increase in electronic communications that many business users report experiencing "email overload;" they receive too many messages to be efficiently addressed. One participant in our survey put it succinctly: "I'm buried by email and I don't know what to do about it."

Given the drastic increase in email use, it is surprising to find that the email interface has undergone little change since its first creation. While greater functionality has been built to extend the email application into the realm of personal information management (task management, calendaring, contact management, etc.), little work has been done to change the traditional inbox viewing system common in most email applications. Email applications typically provide functionality to sort and filter email lists within the inbox, but rules based filtering requires a great deal of maintenance by the user and is not adequate to handle the large volume of email that users receive. Given this information, we made the following assumption: an email application redesign is required to support threading of email conversations within a prioritized inbox and easier filing/ management of messages. We then set out to validate this assumption with email power users.

Our survey proved our assumption to be correct. While it's clear that users are trying to use the tools available to them to get a handle on the problem, few are achieving the results that they desire. 55% of our users reported using an anti-spam product to filter unsolicited email and 58% utilize some form of rules based processing to filter the inbox. Given that the survey was conducted among technology professionals; we expect that these numbers are higher than in the general business populace. However, despite our tech savvy user's reliance on these advanced email tools, 66% of respondents indicated that they have problems addressing email. One survey respondent put it best; "I desperately need a better filtering system; Exchange doesn't work at all!"

We asked our test group what they need to streamline email use. Most responses centered on the presentation and filing of email messages. Here are some quotes:

- "I like to see emails by date, but also want to see connectedness (threads) through the email simultaneously."
- "Biggest issue – I want almost everything I receive, but need to prioritize for reading and action; sort and file in a simple and powerful manner."
- "I have 20-30 active threads at a time and getting those auto-filed would be a big help."
- "I use the flag feature… but it does not give me much in the way of prioritizing."

It is clear from these comments that the email user community would benefit from a redesigned email interface to support a threaded view of messages within the inbox, automatic prioritization of messages, and an easier filing system for quick storage and retrieval.

CLEARCONTEXT INBOX MANAGER™

Based on the survey results, the research cited above, and our own personal experience with email, we set out to enhance Microsoft Outlook® to support the following features:

- Inbox Prioritization – an automated ordering of messages within the inbox, giving those deemed most important to the user (based on sender, thread participation, directness of address, etc.) more prominence than less important messages.
- Thread Organization – the ability to group and label email conversations within the inbox for ease of review.
- Automated Filing – a filing system that takes into account threads rather than individual messages

and supports automated filing of both received and sent messages.

The result is the ClearContext Inbox Manager™ for Microsoft Outlook®, an add-in that works within the Outlook inbox to help utilize email more efficiently.

Design Philosophy

When designing support for the features above, we felt it was important to provide incremental rather than revolutionary change to the user interface. For that reason, we built ClearContext as an add-in for Microsoft Outlook®, currently the most widely used email client in North America.[3] By working within the Outlook application, we felt it would be easy for users to adapt to the functionality provided without being overwhelmed by change. For that reason, ClearContext seamlessly integrates into Outlook by adding a menu bar and creating additional Inbox views that complement existing functionality.

Inbox Prioritization

ClearContext automatically assigns importance to email based on message characteristics such as the sender of the email, user involvement in a thread, the priority assigned to the email, etc.. Automated settings can be overridden to designate certain senders or messages as higher priority. The result is a prioritized, color-coded inbox with the most important email appearing in red at the top of the message list, enabling the user to quickly view and address important messages.
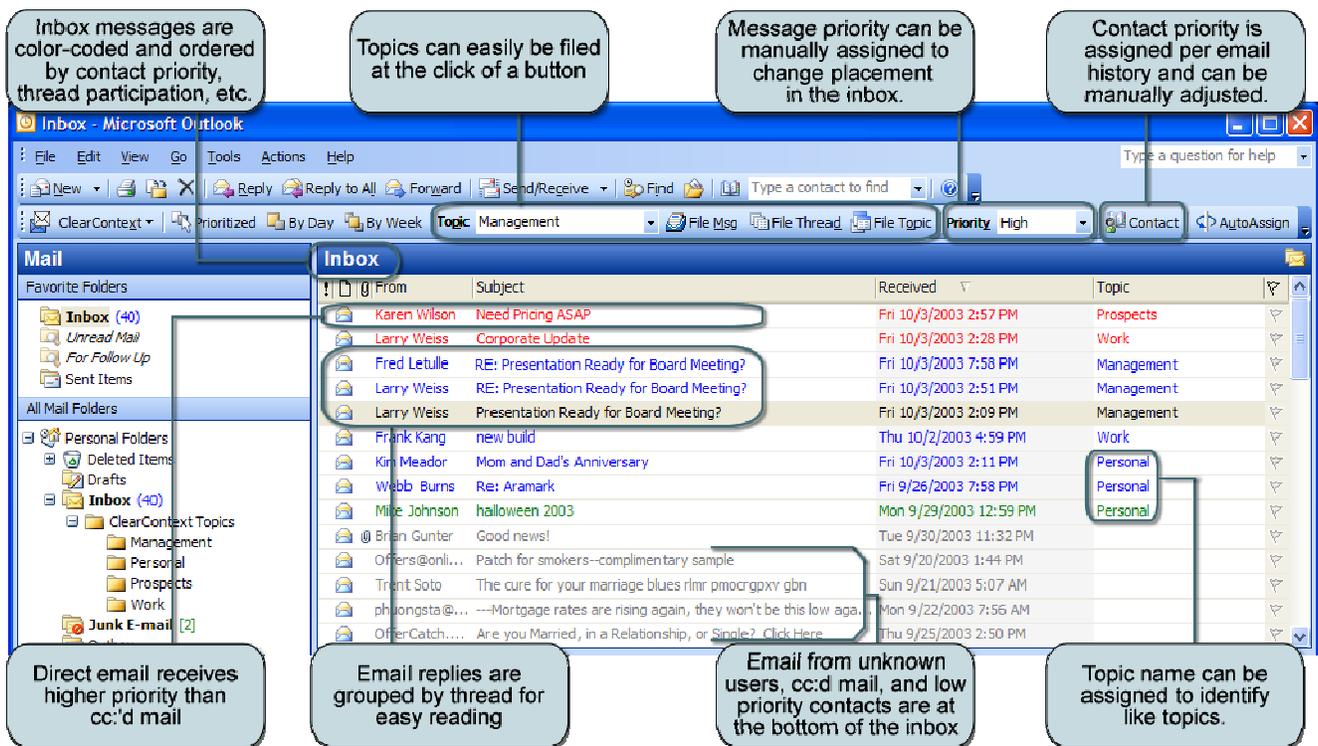
To perform this prioritization, ClearContext goes through several processes to determine which email message is likely to be most important to the user, including an analysis of contact and email history and assignment of message and thread priority.

Contact Analysis and Maintenance

On startup, ClearContext's patent pending contact analysis algorithm analyzes email history and email contact information (within the Outlook data store) to determine from which email addresses the user sends and receives the most email. Email addresses are then prioritized according to volume, giving the user an accurate picture of his/her most important email contacts.

Contact priority is assessed in the following manner:
1. All email addresses contained within Outlook's address book are extracted for analysis.
2. Email history is scanned to identify and extract email addresses that are part of the Outlook data store, but are not present in the user's Contacts.

Inbox messages are color-coded and ordered by contact priority, thread participation, etc.

Topics can easily be filed at the click of a button

Message priority can be manually assigned to change placement in the inbox.

Contact priority is assigned per email history and can be manually adjusted.

Direct email receives higher priority than cc:'d mail

Email replies are grouped by thread for easy reading

Email from unknown users, cc:d mail, and low priority contacts are at the bottom of the inbox

Topic name can be assigned to identify like topics.

3. A score is given to individual email addresses based on the number of emails received from that contact, taking into account the age of received email to ensure that more recent email activity is given a higher score than earlier activity.
4. Additional weight is given to these addresses based on the number of emails that have been sent to that contact, taking into account the age of sent mail.
5. A final composite score is calculated using the weighted score components.

ClearContext creates a prioritized list of contacts, placing those email addresses with higher volume at a higher rank. The top percentile ranges of email contacts are placed into three categories, *Very High*, *High*, and *Normal*. These values are assigned within the user's address book. If an address in the top percentile ranges does not exist in the user's contacts, an entry is created in a special ClearContext Contacts folder within the Outlook data store.

Once this analysis is complete, the application uses this data, along with additional information about the message, to increase or decrease the priority of an email (prioritization details below). The user can manually change contact priority within Contact records, further tweaking the automated analysis.

Message Prioritization

ClearContext's patent pending email prioritization process analyzes email and assesses a cumulative score for each individual message based on four factors:
1. Known Addresses – ClearContext looks at the author of the email and assesses a score that is based on:
   a. The priority assigned to the author of the message
   b. The domain address of the author (in particular, whether or not the domain has been identified in ClearContext's options)
2. Message & Thread Priority – This score is assessed by looking at the priority manually assigned by the user to this email thread (if any), and by giving consideration to individual message priority set within native Outlook.
3. Thread Participation – This factor is based on the number of responses the user has made within this email thread and whether or not the user is the originator of the thread.
4. Message Directness – The score is based on whether the author's name is included in the To: or CC: field and whether the message is addressed to the user only or to several recipients.

A composite score, made of these four factors' subscores, is then assigned to an individual message. Using these scores, ClearContext automatically prioritizes the inbox, placing those messages with the highest score at the top of the message list.

ClearContext color codes the messages to further show priority. The default view places the most important email at the top of the inbox in red, medium importance in blue, low importance in green, and low priority/junk mail at the bottom of the inbox in grey.

The weight given to each of these factors is configurable within the ClearContext options window; allowing individual users to adjust the scoring algorithm to suit his/her preferences. Within the inbox the user may adjust the priority of individual email threads, further enhancing the priority set by the application. In this way, the inbox can be treated as a To Do list, with the user increasing or decreasing the prominence of an email message depending on action required.

Thread Organization

For the purposes of the ClearContext Inbox Manager, we define an email thread as an initial email and all related responses. This is also referred to as an email conversation. Within the user's inbox, all of the responses in a thread of emails with the same subject are grouped next to each other. This is done automatically within ClearContext default views, giving the user a quick view of all related inbox messages.

Though Outlook does provide a Conversation View that handles some of this functionality, it does not provide a facility for ordering these conversations by priority. Most individuals who use this view find themselves switching between the Outlook date-sorted inbox view to the conversation view. For this reason, we believe that users often lose the full context of what they are reading.

Automated Filing

ClearContext supports topic assignment to email. Responses to that email (both sent and received) are automatically marked with the same topic. Buttons are provided on the Outlook menu bar to automatically file entire topics and/or individual messages within the ClearContext Filing system. In addition, ClearContext can be configured to save sent messages into the appropriate topic folder. This saves the user the hassle of trying to locate information in the Sent Mail folder.

For further automation over received messages, the AutoAssign feature in ClearContext allows the user to set up rules for incoming messages. Based on factors such as sender, title, and/or keywords, incoming email can be automatically assigned a Topic Name and/or a Priority. In addition, a rule can be set to automatically file messages meeting these user-configurable criteria.

CONCLUSION/ FUTURE WORK

Using the findings from studies of email overloaded users, ClearContext™ for Microsoft Outlook® has been designed to enhance the user's email experience and improve productivity within Outlook. Initial reaction to the product has been positive, indicating that our assumptions regarding the effectiveness of the application are correct. In the future, we will verify those assumptions via a comprehensive field study of the beta release. For further detail on the product, status on our development, and general email related information, please see our website at http://www.clearcontext.com/.

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ABOUT CLEARCONTEXT CORPORATION

ClearContext was founded in 2002 by Deva Hazarika and Frank Kang with the goal of building applications to help individuals work more effectively with email. The company's first product is ClearContext™ for Microsoft Outlook®, an add-in that automatically prioritizes emails and automates the filing process. Deva and Frank previously co-founded Moai Technologies, an enterprise software company. For more information on ClearContext Corporation and its products, please see http://www.clearcontext.com/.

ClearContext Corporation
470 3rd Street, Suite 208
San Francisco, CA 94107
http://www.clearcontext.com/
info@clearcontext.com