



Email Management Assistant: Emma

Bringing sanity to e-mail

Just as the spread of the internet through modern society has opened up innumerable new opportunities for business and communications, it has also delivered its fair share of headaches. Information overload has become a catch-cry of those workers who feel they are being swamped by data pouring through the connections, with e-mail nominated as the greatest culprit. And with spam growing to comprise more than half the traffic on the Internet, problems are only set to get worse.

Hence in February 2002, researchers at Smart Internet started working on an E-mail Management Assistant called EMMA. According to the project leader for EMMA, Associate Professor Wayne Wobcke from the School of Computer Science and Engineering at the University of New South Wales, the goal was to create a reliable and easy-to-use automated e-mail sorting and filtering system which could take some of the tedium out of dealing with large quantities of e-mail.

“The cause of the problem is that e-mail communication, and communication generally, is becoming a bigger part of people’s working lives, leading to an expectation that people be more readily available and be able to respond more rapidly to more and more communications, creating a need for them to manage their communication more effectively. The starting point was that existing e-mail clients were very poor at helping users manage the volumes of e-mail they receive. The problem was to develop a method where users could intelligently sort the e-mail in their Inbox into various subfolders that were meaningful, then use that information to prioritise their e-mail handling.”

Bringing order to chaos

Numerous ideas had been put forward for assisting in the process of managing e-mail, but none had solved all of the problems. Most e-mail packages contain a mechanism for writing rule-based systems for automatically filtering, archiving and deleting mail. While these are good for defining a small number of rules, as the number of rules increases the tools become increasingly difficult to use, since to write a new rule the user must also understand all of the previous rules and how they interact. Because of the burden of this complexity, most people simply do not use these rule systems.

The EMMA team also investigated work that had been done in applying machine learning to e-mail management, but again found that these approaches don’t work, due to the ad-hoc complexity of e-mail communication. Typical machine learning systems can achieve accuracy rates of no better than 60% to 80%, which is not high enough for people to “trust” an automated system to handle their e-mail correctly.

Ripple down results

The EMMA team took a different approach, adopting the concept of ripple down rules (RDR), an approach that had not been tried with e-mail management before. RDR systems provide extensive help to the user in defining rules and maintaining the consistency of a rule base, making EMMA easy to use. Users never even have to look at the rule base in order to define or correct an existing rule – they only have to look at the message they are currently classifying. An RDR system helps the user maintain the consistency of the rule base by prompting them for a decision whenever a new rule potentially conflicts with an existing rule. Using this approach, EMMA achieves a very high degree of accuracy without the difficulties of use typical of existing e-mail clients.

EMMA employs individual 'if-then' rules with conditions such as the sender, recipients, subject and key-words/phrases in the content of the message. These are used to sort messages into virtual display folders before the user reads them, or to assign messages a priority or action to be performed, such as reading, auto-replying, deleting or archiving the message. Hence EMMA is able to address multiple aspects of e-mail management, including sorting, prioritisation and automatic reply, using a highly accurate rule-based approach that is easy to use.

One size fits all

The team also investigated the way in which different people process their e-mail, such as whether they sorted their messages by topic, urgency or sender, and whether they stored messages in more than one place. They were keen to build a system that could assist users regardless of whether their volumes of mail were large or small or the particular way they dealt with their mail.

Use of ripple down rules makes it easier for users to create sophisticated rule bases, hence increases the accuracy with which EMMA handles messages. This encourages users to place their trust in the system. For the project, Wayne and the team developed their own e-mail client software, although it would also be possible to develop the system as a plug-in for existing commercial software.

The underlying technology of EMMA can be taken in many different directions. The group is investigating options to deploy EMMA in a mobile communications environment, and will also look at opportunities for applying it in other applications, such as knowledge management systems and Web content publishing tools.

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Smart Internet Technology CRC,
Bay 8, Suite 9/G12 Australian Technology Park
Eveleigh NSW 1430 Australia
T: 61 2 8374 5080 ■ F: 61 2 8374 5090
E: innovation@smartinternet.com.au
www.smartinternet.com.au

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