

An Integrated Fax/E-mail Database in Cooperative Environment

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1 Introduction

The rapid increase of electronic communication via computer mail, faxes and voice mail, has led to a variety of disjoint applications and usage paradigm. Recently various kinds of software to support cooperative work on distributed computer systems, called *groupware*, has been developed. We have developed a new type of such a system, *VirtualOffice*, that seamlessly supports usual office work between personal working space and group working space. *VirtualOffice* provides an environment where many office elements are virtualized, and users can use these elements through user-friendly interface. To realize functions of *VirtualOffice*, it is required to integrate communication equipment. As communication equipment is integrated with, users are able to control it sitting in front of a terminal using user-friendly interface.

In this paper we describe a system that provides users with an integrated way to send and receive messages using different media (e-mail, fax).

2 Integration of Fax/E-mail Database

2.1 System Architecture

The architecture of this system is shown in Fig.1. Users interact with *integrated system*, issuing com-

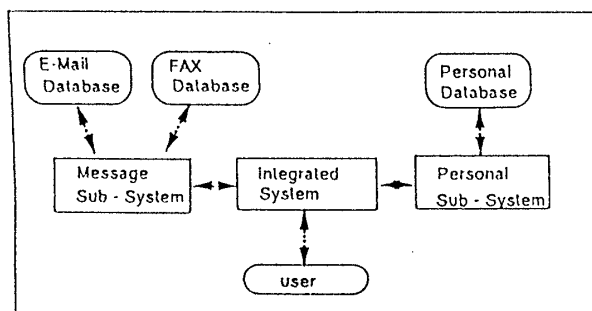


Fig.1 Integrated System Architecture

mands to read new messages and to retrieve others from the database. When a user decides to store the new mail message, the *integrated system* compares the subject of the mail with the research topics of personal database in order to classify through *personal*

sub-system and *message sub-system*. When a user decides to store a new fax message, the *integrated system* finds the research topics of personal database with sender's number of fax machine as a key through *personal sub-system* and *message sub-system*. The implementation of classification mechanism is discussed in Section 3. The *integrated system* also allows the user to send messages via fax/e-mail. The user simply composes the message in the terminal and selects fax/e-mail as the media. The fax number/e-mail address of the recipient is retrieved from the personal database. As the *integrated system* is realized by HyperCard, user-friendly interface is realized.

2.2 Supporting Mail Message

Incoming mail message will be followed by a dialog box stating that a user has new mail. User selects button "Check Mail" from the file menu when there may be a new mail. When a user see the message that new mail have arrived after this operation, he click "OK" button in the dialog box. "In mailbox window" will automatically appear, listing inside it any incoming message.

Messages stored in a mailbox are listed in the mailbox window as individual message summaries. A message summary is divided into fields containing the address of sender or recipient of the message, the contents of the "subject" field and possibly the date and the sizes. The incoming message should be listed in "In mailbox", and can be identified by what are entered in its "from", "date", and "subject" fields. To open a message, simply double click on its corresponding message summary in the listing of the mailbox window. The incoming message will be stored automatically in several directory by *integrated system*. If the e-mail address is new, the *integrated system* asks by showing the message, "Supply sender's information for this new e-mail address".

2.3 Supporting Fax Message

The *integrated system* deals with information coming from media other than electronic mail. In particular, we can receive and store information coming from fax machines. Faxes are first received by a fax board. If a new fax is received while user is working by another application, the menu periodically rotates with "Receiving Pole" icon. If user wishes to view the message immediately when he finds the icon, he selects "Unopened Mail" from the "In Box" menu. As selecting "Unopened Mail", the system shows the screen

"Opened Mail". For each received fax, an envelope appears displaying the following information:

- date and time when the fax document was received.
- the sender's name, or the fax number that transmitted the document.

After to be viewed, for each document of the information displayed: date, time, the fax number, etc. To open a message, simply double click on its corresponding message summary within the listing in the mailbox window. The incoming message will be classified semi-automatically in several directory by *integrated system*. If the fax number is new, the system asks by showing the message like supporting mail message.

2.4 Management of Personal Database

Users can store personal database that contains addresses, phone numbers, e-mail address, the fax numbers, and other information. Users interact with personal database via interfacing the *integrated system*. Whenever a new e-mail address or a new fax number happen to be found, the system asks to create the information about that. Because the content of personal database may be used variously by the *integrated system*, it must be maintained carefully.

3 Advanced Functions

3.1 Automatic Classification Function

A mail message commonly have two pieces of data:

- *Headers*, i.e. value pairs such as "subject: VirtualOffice Meeting" or "from: lee".
- The body of the message.

In the *integrated system*, we use the subject term in order to classify the message automatically. Fax message, on the other hand, contains only the sender's fax number and the time to be sent/received. Therefore we use the fields of personal database, such as research topics, in order to classify a new message.

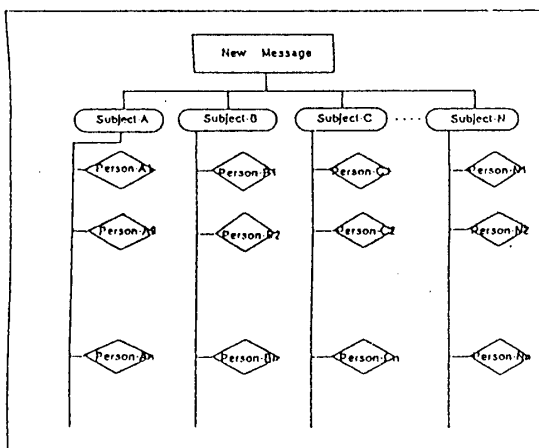


Fig.2 Automatic Classification

General steps of implementation are as follows:

- Read personal database with key(e-mail address, or fax number) If failed, execute "Add Informa-

tion".

- Compare the subject of mail with the research topics of personal database. If failed, Default is to be Private directory(e-mail).
- Find research topics of personal database. If all blank, Default is to be Private directory(Fax)

Automatic Classification Function can be executed in precisely as shown in Fig.2. Each subject, receiver, and sender is categorized by its own shape.

3.2 Temporal Database Function

For automatic classification it is very much important to use communication history. If the user A communicate with user B on subject C, the fax received right after the communication by B may also discuss on C. Such temporal database functions are realized. Conventional e-mail/fax systems stored each documents in only one location. For some documents two or more locations are required. In the *integrated system*, this function can be realized by automatic classification in the above section. Because several directories, especially temporal will be created by the results, the user can locate the messages to one or more directories.

4 Remarks

In this paper, we discussed an integrated system of fax/e-mail databases for cooperative environment. The integrated system is a message system to support research groups in collaborative activities. It integrates e-mail and fax systems that have already widely used. In this integrated system, we have introduced the new advanced functions, automatic classification function and temporal database function.

The current system has the following problems.

- lack of schema modification function.
- lack of security mechanism.

We need to solve these problems in order to improve the prototype system.

References

- [1] Y. Kambayashi, et al, "Basic Design and Implementation of Basic Function of VirtualOffice", Tech. Report of IPS Japan, HI 41-17, March 1992 (in Japanese).
- [2] H. Takata, et al, "An Object-Oriented Office Shape Description Model and an Office View Management Mechanism for Distributed Office Environment", Proc. of 4th Int. conf. on FODO, pp164-196, Springer-Verlag, Oct. 1993.
- [3] LEE SangHoon, et al, "Realization of FAX database System for VirtualOffice System", 45th Annual convention IPSJ, 7M-04, 1992.
- [4] C.A. Ellis, et al, "GROUPWARE: Some Issues and Experiences", ACM Comm, Vol. 34, pp 39-58, January 1991.