XMAIL: AN INTELLIGENT ELECTRONIC MAIL SYSTEM

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Electronic Mail Systems (EMSs) have been a boon to organizational productivity and yet, EMS users may suffer from problems of electronic junk mail, information overflow, and disrupted communication flows. Intelligent EMSs, or Knowledge-based Message Systems (KMSs), enhance electronic mail in organizations by automatically selecting mail addressees, managing incoming mail, and routing messages, among other functions. This paper describes the benefits of this new technology and presents a prototype KMS called XMAIL (eXpert MAIL) developed at the University of Mississippi which is specifically designed for microcomputer systems on a Local Area Network. A scenario using XMAIL demonstrates the usefulness of the prototype and new technology.

Electronic Mail Systems (also known as E-mail or EMSs) have proliferated as a useful organizational communication medium because they provide the flexibility to communicate from any place, at any time, and to any person without worrying about their physical location or presence. If used effectively, EMSs can reduce intra- and inter-organizational communication costs, enhance efficiency and effectiveness of organizational communications, improve organizational coordination, and facilitate better problem solving and decision making in organizations (Rice and Shook, 1988; Montgomery and Benbasat, 1983).

Many EMS analysts have predicted that electronic mail will become as simple, as diverse and as ubiquitous as that of the telephone (Ulrich, 1986). There is, however, a great potential for EMSs in supporting other organizational activities provided adequate technological advances are incorporated into this technology.

Several recent technological enhancements have been made to EMSs. These new, intelligent electronic mail systems make use of rule-based knowledge for disseminating and managing electronic messages for e-mail users. This paper describes the functionality and advantages of intelligent EMSs, sometimes known as Knowledge-based Message Systems (KMSs), and presents XMAIL (eXpert MAIL), a prototype KMS developed at the University of Mississippi. XMAIL has
two significant features. First, it includes intelligent message receipt and dissemination functions rather than intelligent message receipt management alone. Second, and perhaps more important to managers, XMAIL is implemented on an IBM-PC microcomputer local area network (LAN), a hardware and software environment found in many organizations. Nearly all other KMSs have been restricted to expensive and sophisticated workstation environments found only in R&D laboratories.

Intelligent Mail Systems

Intelligent mail systems or KMSs have been developed as a possible solution to many problems existing with current EMSs. This section describes these problems and the benefits to be gained by using a KMS. Finally, a survey of KMSs is presented to illustrate the advantages of XMAIL.

Limitations of EMSs

EMSs have been used mostly as message processing systems (Sumner, 1988; Crawford, 1980) rather than communication support systems that actively support organizational activities. This focus on simply processing messages rather than enhancing communication has resulted in several problems with the technology including an increase in electronic junk mail, message overload, and disrupted communication flows, all discussed in further detail below.

1. Increase in Electronic Junk Mail. It has been widely recognized that EMS technology not only increases the number of people who communicate with an individual but also provides easy access to a personal mailbox.

According to Dennings (1982), EMSs have focused mainly on disseminating information. They provide quicker mechanisms to disseminate information than are possible with traditional communication methods such as face-to-face meetings and telephone calls. While an EMS provides such benefits as easy creation and distribution of messages, it also can be misused to generate a multitude of electronic junk mail. For example, EMSs allow users to broadcast messages by building distribution lists. This feature can be a benefit to marketers who can easily populate large numbers of mailboxes with advertisements of their products or services. A study by Crawford (1980) indicated that 60 percent of the users in an organization felt that their junk mail increased after the installation of their EMS. Several other organizations that have installed EMSs report similar increases in electronic junk mail (Seaman, 1984).

2. Message Overload. One of the main effects of electronic junk mail is message overload. According to Stohl and Redding (1987), “Message overload refers to the transmission of new information at a rate that far exceeds that of the input-processing and output-generating capabilities of organizational actors.” The problem of message or information overload has been widely recognized in the communication and information processing literature. Hiltz and Turoff (1985) concluded, based on observations, user surveys, and controlled experiments, that individuals perceive information overload when their screening skills cannot keep up with the communication volume. At high rates of information overload, Miller (1984) found that individuals consider filtering and omitting (ignoring) information to limit the useless junk mail. Although message overload can be avoided by inhibiting transmission of the junk mail at the source, there is also the potential of losing useful information and ideas coming from one’s electronic partners (one of the valuable impacts of EMS).

3. Disrupted Communication Flows. EMSs provide very few restrictions on the access to mailboxes of the users, which not only creates the potential for information overflow but also allows bypassing of existing communication channels. According to Sproull and Kiesler (1986), the lack of social cues in electronic mail messages creates a status equalization process among the communication partners. That is, unless the sender is known to the receiver of the
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