Electronic mail: Evolving from intracompany to intercompany

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ABSTRACT

The roots of electronic mail technology go back to the first facsimile systems, but most people today think of electronic mail as computer-based message systems (CBMS)—either remote electronic mail services or electronic mail software packages running on in-house computers. Systems and services providing access to databases and data processing as well as simple command and menu structures will attract new users. Over the next five years, as electronic mail use grows, the people who communicate within companies (intracorporate communications) will want to contact people outside their company (intercorporate communications). Value-added services that provide private messaging systems must begin providing access between organizations' private networks and the value-added networks. They must also make possible user-transparent access between organizations that subscribe to their services. Today only a few services provide this facility, and then only by special arrangement. Eventually it will not matter which network a user signs onto to receive mail; gateways will provide transparent access between the networks to make it possible to have internetwork and international electronic mail.
INTRODUCTION

Electronic mail technology traces its roots to the first facsimile systems. But most people today think of electronic mail as computer-based message systems (CBMS). These systems stem from the first remote timesharing service bureaus and have evolved into software packages for in-house computers. Users can now meet their messaging needs by choosing remote electronic mail services, electronic mail software packages that run on their computers or turnkey systems.

In the early days of data processing, hardware vendors offered users little in the way of applications software. The third-party software industry evolved to address that market. Some companies provided software for customer-owned hardware; others offered to run programs on their computers—either interactively from terminals at the user site or as batch jobs. To compete with this new industry, hardware vendors began offering more sophisticated programs. The timesharing companies countered with additional programs. Among these programs were electronic mail systems.

With the advent of electronic mail, timesharing companies held an initial advantage over hardware vendors: They were communications-oriented from the start. In many cases they had to interconnect multiple sites. Although hardware vendors also sold to multiple sites, they did not connect them.

The first timeshared messaging systems—Comet, from the Computer Corporation of America (Cambridge, Massachusetts) and OnTyme from Tymshare (Cupertino, California)—and their followers aimed at meeting the over 80% of business communications between people in the same company. The systems allow messaging between all those at the corporation who have access to the service. These services help users escape telephone tag and USPS delays by providing a simple means to send short (4- to 6-line) messages.

Recognizing that in-house computers could more effectively, in cost and usage, meet intracorporate communications needs than could outside services, computer vendors and some software houses developed electronic mail programs for installed hardware. To send a message within a single facility, it makes more sense to take advantage of the on-site computer than it does to dial up a remote computer, which involves additional communications and timesharing costs. Employing an in-house computer for electronic mail allows users to add an application to help justify the cost of the computer and its peripherals.

Recently, hardware manufacturers began offering software programs that run on the computers they sell to end users. Third-party software houses also wrote programs for specific hardware located at customer sites.

Now virtually every major hardware and software vendor and value-added carrier and a number of timesharing companies offer electronic mail packages.

TRENDS IN ELECTRONIC MAIL

During the next five years, electronic mail use will skyrocket. As it does, the people who communicate within companies will want to contact outside people and therefore will want to bring the conveniences of intracorporate electronic mail to intercorporate communications. Intercorporate links decrease order processing, improve inventory control, and establish direct-payment channels for various transactions. This usage growth (See Table I) will spark the development of bridges and gateways between services and in-house software.

Market growth projections show that the number of service-bureau-resident mailboxes will double each year through the end of 1984 and that growth will then slow to 50% each year during 1985 and 1986. Private-system mailboxes will increase by 50% each year through 1984 and then by 75% in both 1985 and 1986.

Concurrent with this spectacular growth, the market will see a major shift in use and applications. The 200,000 service-based mailboxes in use during 1983 will see heavy intracorporate messaging applications, and internal mail systems will experience a mixture of messaging and management support applications (like calendars and reminders).

After 1983 there will be a change in the way that systems and services are applied. Private electronic mail systems will pick up the bulk of intracorporate messaging, and public services will provide intercorporate messaging. Public and private telephone systems provide a good comparison. Corporations install tieline networks for intracorporate communications and use the public-switched telephone network (PSTN) for outside communications. Employees receive two telephone numbers, one for the tieline-based system and one for the PSTN. Similar communications systems will evolve for

<table>
<thead>
<tr>
<th>Year</th>
<th>Service Users</th>
<th>Private Users</th>
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</thead>
<tbody>
<tr>
<td>1981</td>
<td>49,000</td>
<td>80,000</td>
</tr>
<tr>
<td>1982</td>
<td>98,000</td>
<td>100,000</td>
</tr>
<tr>
<td>1983</td>
<td>196,000</td>
<td>150,000</td>
</tr>
<tr>
<td>1984</td>
<td>392,000</td>
<td>225,000</td>
</tr>
<tr>
<td>1985</td>
<td>588,000</td>
<td>393,750</td>
</tr>
<tr>
<td>1986</td>
<td>882,000</td>
<td>690,000</td>
</tr>
</tbody>
</table>

Source: The Yankee Group.
They will use the internal system for intracorporate mail and public electronic mail services must provide additional services to start with public databases (as some already have), for the services, but a drop in traffic, as users turn to their counter this trend and to make up for the fact that they acquire multiple public mailboxes to accommodate correspondence for the majority of their communications. To personal communications will take place. Today some of the customer/supplier communications like invoices, purchase orders, and electronic funds transfers. Finally, intersystem personal communications will take place. Today some of the public electronic mail services allow intercorporate communications; in most cases it requires making special arrangements between the two companies and the service provider.

Historically, electronic mail services have not been very user-friendly. Even the most recent market entries deliver only minor improvements in the user-service interface. All the services require cumbersome sign-on procedures, and message editing requires the skills of a safecracker.

Since electronic mail is usually aimed at managers and professionals, these difficulties combine to keep usage low. Since electronic mail is usually aimed at managers and professionals, these difficulties combine to keep usage low. Since it is a new technology, getting people to try it is half the battle. Because the services are difficult to use, vendors have frequently lost the battle.

Increasing market pressure will change this situation, because it will contribute to the development of new features and capabilities by the services. Under the influence of recently introduced electronic mail packages—such as Bolt, Beranek, and Newman’s InfoMail; Digital Equipment’s DEC-mail; and IBM’s Professional Office System (PROFS)—services such as Comet, Dialcom, InfoPlex, and Telemail are extending their capabilities and becoming easier to use.

As electronic mail systems gain a wider range of capabilities—database and data processing access as well as simple command and menu structures—more users will find the various alternatives increasingly attractive. Concomitant with an increase in users comes increased use and demand for more features. Further, during the last year sufficient market pressure developed to drive suppliers to provide more functional systems.

Electronic mail no longer refers to simple messaging capabilities. Today’s systems deliver sophisticated mailing features like message forwarding, note attachments (buck slips), multiple copies, and mailing lists. Additionally, the systems provide management support functions, like word processing, hierarchical filing, calendar management, tickler files, and reminders. The services are just beginning to provide capabilities like calendar services and access to public databases.

Although the services remain the functionally simplest of electronic mail media, constant pressure from software vendors will force them to provide comparable functions. Increased user-friendly functionality will promote higher usage levels, especially when systems improve management efficiency, eliminate telephone tag, and speed effective communications.

As usage increases, intracorporate electronic mail users will want to bring their electronics-based benefits to intercorporate messaging—benefits like bill paying, order entry, and inventory updates. Just as people today know they can reach almost anyone through paper-based mail services, people using electronic mail systems will eventually want to connect individual systems so that they can exchange intercorporate as well as intracorporate mail. Therefore, the value-added services that provide private messaging systems will begin providing access between organizations’ private networks and the value-added networks (VANS) as well as between organizations subscribing to their services (this can be specially arranged today on some services). The step following that will be gateways between networks, which will overcome today’s networking Tower of Babel.

It will not matter which network a user signs onto to receive mail. Gateways will provide transparent access between the networks to allow internetwork electronic mail. Today it is hard to imagine representatives of the different VANS getting together to discuss gateways between their networks, but the business pressures that will force such meetings are already evolving.

The IBM Information Network and American Bell’s AIS/Net 1000 aim specifically at intercorporate communications. And American Bell goes so far as to state a desire to be a “network of networks.”

Last October IBM’s Information Network won a major contract from the Insurance Institute for Research to provide a value-added network that will allow property and casualty insurance companies to communicate with their independent insurance agents. This Insurance Value Added Network Services (IVANS) will deliver communications capabilities between some 70 different computers and terminals, including many non-IBM devices.

IVANS will provide a range of communication processing functions beginning in mid-1983:

1. Store-and-forward message switching, both prescheduled and on demand
2. Interactive access to network-resident application programming
3. Access to an insurance industry database
4. Speed, protocol, and data format conversions to allow dissimilar terminals to communicate
5. Storage of messages and data
6. Support for user-written programs
7. Network security, management, and documentation

IVANS is an ambitious project for bringing an entire industry on line. IBM has combined communication processing with timeshared application processing and has also offered the network on an intercompany basis. Many other such industry networks will be implemented in the near future for
trucking/transportation companies, airline and hotel reservations, banking, retailing, and similar fields. Vendors competing to provide these quasi-private networks include not only IBM and American Bell, but hardware vendors like Tandem and Control Data, service bureaus like Tymshare and NCSS, and carriers like Isacom and SBS.

The forerunner of these systems, the Transportation Data Coordinating Committee, has developed standards for electronically communicating purchase orders and invoices for the trucking industry. The grocery industry has also established a data communications standard (the Uniform Communication Standard) for orders and shipments between major food processors/manufacturers and large warehousing/wholesale organizations.

To further international and intersystem communication, the CCITT formed a study group to develop international standard protocols for connecting existing and future CBMS and document distribution systems. It is called the CCITT Special Rapporteur Group on Message-Handling, Study Group VII.

Among recent decisions, this group drafted access protocols to enable users of teletex, facsimile, and related systems to make use of CBMS-based message transfer services. It also refined and extended existing specifications for the relay protocol governing message exchange between separate domestic and/or foreign CBMS systems. This specification now includes the control information that acts as an electronic "envelope" for messages in transit.

These CCITT steps follow the recently-agreed-upon National Bureau of Standards Specification for Message Format for Computer Based Message Systems. Bolt, Beranek, and Newman; Computer Corporation of America; Dialcom Inc.; Digital Equipment Corp.; GTE Telenet Communications Corp.; and Tymnet have all agreed to support that standard. Other electronic mail service and system providers have said they will back the standard if enough demand develops.

IBM has seriously considered document communications integrity between its systems. Its philosophy takes shape in the Document Interchange Architecture, Document Composition Architecture, and Graphic Codepoint Definitions. IBM supports these blueprints on the 5520 administrative system, the Displaywriter word processor, and the 8100 computer under the Distributed Office Support Facility (DOSF) and the Distributed Office Support Systems (DISOSS) software programs. Recently these architectures were spread to the majority of IBM's office systems, most notably the Professional Office System (PROFS).

Outside IBM, standards currently agreed upon and those under discussion cover only message addressing; message format integrity remains to be formalized. Current standards like HDLC and X.25 do not guarantee that a message formatted and sent from one system will appear the same way at the recipient's terminal. This issue has just started to be addressed. In 1984 the CCITT is scheduled to formalize the Group 4 facsimile standard. Group 4 will be teletex compatible, and the two systems will allow text and graphics to be transferred between systems with full integrity.

Increasing system/service sophistication and compatibility will lead to new applications and to growing numbers of users. These developments augur the advanced, interconnected electronic mail systems that will evolve from today's individual systems and services.
DECISION SUPPORT SYSTEMS

The series of sessions on Decision Support Systems (DSS) tackle the questions that DSS faces in the 1980s. How does a manager today effectively use the technology of mainframe, minicomputer, and microcomputer to produce cost-effective solutions for decision support? Several sessions directly address this question and come to some very different conclusions.

1. The first proposes that “Micros Can Do It All.”
2. The second tells convincingly why only custom, micro-based decision support systems can address this problem.
3. Two sessions cover all aspects of designing systems of this kind.
4. A fifth session presents micros, minis, and large computers in a distributed financial planning/decision support environment.
5. A final session discusses how these technologies are all being integrated into executive information systems for senior corporate executives.

These sessions meet the most puzzling questions of the micro versus mainframe debate head on. There is substantial material here for both the management information system user and the non-computer-oriented decision maker in any corporation.