VOICE MESSAGING & ELECTRONIC MAIL: AMERICAN EXPERIENCES

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Introduction

In this talk I am going to describe some of the experiences we have had in Citibank during the last few years on Voice Mail and Electronic Mail. Before I start I would like to emphasize that the acceptability or unacceptability of services like these are probably as much a function of the culture and business requirements of a company as the characteristics of the services themselves. So, my experiences are far from the last word on this topic. In fact, I hope we will hear some very different points of view during this conference to stir up a lively debate.

Background: Citibank's communications

Citibank already had a number of fairly good inter-office communications facilities before either Voice Mail or Electronic Mail were piloted. There is a store-and-forward message network with terminals in almost all our major branches, plus over 300 terminals in Head Office buildings in the New York area. Message delivery times are less than a minute between most locations. We also have a number of leased circuits for voice between the 20 largest branches, so staff in these locations can call one another very easily by dialling 6 or 7 digits.

Both the Voice Mail pilot and the Electronic Mail pilot were carried out within a year of one another, and many of the staff in the Voice Mail pilot were not at that time Electronic Mail users. I say this to forestall the criticism that one of the pilots may have been "unfair" because of competition between the two services.

Voice Mail Pilot

In looking at the various systems available, it seems that voice mail systems can be classified into three categories:

(a) Systems tied to the office PBX, with message pick-up only from PBX extensions. In these systems the incoming calls are routed to a centralized voice mail facility if the call is unanswered for a certain number of seconds, or if the extension is busy. Users pick up their messages by dialling a special code from a PBX extension.

(b) Like (a), but with the added feature of users being able to phone in to the system from any telephone anywhere and retrieve their messages using a touch-tone telephone or, from a dial phone, by holding a touch-tone signal unit close to the telephone mouthpiece and keying in command sequences.

(c) Systems completely separate from the PBX and generally operated on a bureau basis. With these systems the sender of a message has to deliberately set out to deliver a voice mail message to someone else by first dialling a special number to get into the system, then identifying the addressee using a code (which can, for simplicity, be the addressee's business telephone number). Every user has to dial in to the system regularly to see of there are any messages for him or her. To operate the system a user can use a touch-tone telephone or, from a dial phone, hold a touch-tone signal unit close to the telephone mouthpiece to key in command sequences. With this type of service messages can be sent or collected from any telephone anywhere. In fact, insomniacs can compose voice mail messages in the middle of the night from their home or hotel room, ready for their staff and colleagues to act on the next morning.

The pilot that we conducted was based on this third type of system. We used the VMX (Voice Message Exchange) service. This was accessible via a 7-digit New York number or via an '800' number from anywhere in the USA. We also arranged for the service to be accessible via our private voice network and we included a few users in Europe in the pilot.

In total there were 120 users in the pilot. Each user's "address" was his 7-digit (DDI) business number. We also set up distribution lists, containing all the users in particular departments or on committees, so that they could send messages to all members of the list using a single address.

VMX is fairly easy to use, and nobody had any difficulties from the point of view of getting to know the system. There are clear voice prompts to guide you through each step, and the main "commands" are printed on the hand-held touch-tone units.

Pilot results

The pilot lasted six months. At the end of that period we conducted a thorough study of users' reactions, including a questionnaire and follow-up interviews.

Overall, the pilot was a failure. Nobody really liked using it and usage declined rapidly after the first few weeks. Once the usage started to decline, people's frustration with the service grew: people said they found it annoying to dial in and find no messages at all waiting for them.

In the survey conducted at the end of the pilot, a number of suggestions were made about how some of the minor shortcomings of the service could be improved. These included

(a) linking the system in with the PBX so people could leave voice mail messages if someone is away from the office, without having to make a separate call into the voice mail system, and so that messages can be picked up by pressing a couple of buttons; and (b) having a lamp on the office telephone to indicate when there are new messages for the user. However, a great many users said that, even with such minor improvements, they felt the whole idea of voice mail had major intrinsic limitations that would not be overcome by such "cosmetic" changes. In short, there is something about it that people do not like.

I have a personal theory, that I have not yet found way to subject to scientific test, that the problem with voice mail is that human beings are (1) fundamentally and unalterably uncomfortable with speaking into silence (e.g. a telephone answering machine or a voice mail system, where there are none of the reassuring grunts and mutterings that you get from another human being during a conversation); and (2) human beings are similarly unhappy with having another person's voice come at them from a machine to deliver a message to them personally.

This, I believe, accounts for the hatred people feel towards other people's telephone answering machines. Voice mail is doubly bad because it subjects the message-leaver to the answering machine phenomenon, and it subjects the person to whom the message is addressed to a "playback" experience which is less easily controlled than the playback of messages on an answering machine. Also, many of the users in our pilot said to us "off the record" that they felt their bosses had sometimes deliberately chosen voice mail as the method of delivering an unwelcome message (e.g. giving them an unpleasant task to do), instead of a direct telephone call. A number of users also said that their colleagues and bosses rambled on incoherently for many minutes when speaking their messages, unchecked by "well, I must go now" responses from a human listener.

Setting aside these fundamental objections to voice mail for a moment, the improvements which were suggested by the pilot users point to a PBX-linked system as an improvement over a separate bureau service. Since the pilot, a number of Citibank buildings in the New York area have installed PBX-linked systems (in most cases provided by the PBX vendor). Responses to these systems have, on the whole, been almost as negative as the VMX system used in the pilot, particularly from people who make calls into the buildings concerned.

There is a clear perception that "you can never get hold of a human being any more" in the buildings with voice mail because such a large proportion of incoming calls end up being routed to the voice mail system. Two people, both with voice mail activated on their telephones, can now spend days trying to have a real conversation with one another!

In short, I believe that voice mail is a solution looking for a problem. At best, it is an expensive telephone answering machine. At worst, it is a menace.

Electronic mail

The term "electronic mail" means different things to different people. To the PC-freak it can mean sending files from one PC to another using a modem at each end. To a secretary it can mean sending a word processing document from one word processor to another. To many PTTs it means teletex. To Cable & Wireless Easylink it means access to the telex network from a computer-type terminal, using dial-up through the telephone network. To Telecom Gold or Istel it means electronic mailbox service. Some people include ordinary telex within the definition of electronic mail. Some do not, because telex is all-upper-case.

Everybody is entitled to their view of electronic mail. However, this diversity of ideas and systems means that the day is still some way off when someone who has just completed the drafting of an important report or memorandum can say to his or her assistant "send it electronic" and know that this instruction is unambiguous.

In order to allow this presentation to become specific enough to be of any practical value, I am going to talk only about an electronic mailbox service that was piloted in Citibank in 1981 and, unlike voice mail, has gained rapid acceptance and widespread use.

Electronic mailbox

Electronic mailbox is the term I use to describe a system like Istel's Comet service or BT's Telecom Gold, whereby one person composes a message from a terminal or PC, linked to a central computer system for the duration of an electronic mail "session". The message is addressed to another electronic mailbox user and is sent. At some time later that other user accesses the system from his or her terminal and the system says that there is a new message waiting to be read. The user reads the message on the screen of his or her terminal. In some cases the message may be printed on an associated printer.

The important characteristics of electronic mailbox services are (a) the messages have to be collected from the system: they do not come automatically to their addressees like telex messages; and (b) they can be accessed from any location where there is a suitable terminal: the user is not tied to a specific terminal as with a telex machine (or teletex terminal).

Also, the communication is from one person to another, not from one person's office to another's.

To establish an electronic mailbox service for your company you need to give each user access to a terminal or PC, with a modem, so that the terminal can be connected to the system via the telephone network. The system may be either a private one, owned and operated by you, or you can sign up for a public service.

If you use a public service you will probably want to establish a "closed user group" for within-company communication. Or you may want a public mailbox for individuals who

need to communicate with other companies. However, inter-company electronic mailbox delivery is still in its infancy, and does not have the standing of telex for communicating contractual messages.

It may be a good idea to try a public service to start with and then buy your own if it proves successful. You may not want to build your own system if you do not have any significant data centre operations in your company where the system could be supported.

The break-even point between public and private systems is between 300 and 500 users.

If you build your own system you will need a computer and an electronic mailbox software package, such as Istel's "Comet". You will also need a number of telephone lines and dial-in modems to provide access to the system from the users' terminals. (If your company has a private data network you may be able to use this instead of dial-up through the telephone network. It is not generally wise to use dial-up through a PBX to such a system because of the heavy traffic load it attracts.)

Citimail

The system that Citibank now knows affectionately as "Citimail" started as a pilot in Citibank London in 1981. One of my colleagues took an old DEC PDP11/70 minicomputer, that had finished its life as a host for a small financial processing system, and bought a licence for the Comet electronic mailbox software package. A pilot group of 50 users were enrolled on the system within London.

Very quickly the system became popular and staff throughout Europe were asking to be enrolled on the system. The system was connected to Citibank's private data network, and use of the system grew rapidly, as it gradually became accepted as the primary means of person-to-person communication for administrative (as opposed to financial) traffic.

In January 1983 we put 100 pilot users on the system in New York, and by the end of the year the system had been accepted as an official corporate service, with a total of 5,000 users (out of a worldwide staff of about 65,000).

Since establishing the system as a corporate utility we have been through two major developmental steps. The first, in late 1984, was the implementation of the "multi-node" version of Comet. We had already added two more DEC PDP11/70s in London - one as a second live system, and one as a backup, should either of the other two fail. The third system to be added was added in New York (with its own backup computer), connected to the two live London systems via two 4800bps synchronous data links through our private data network. Since then we have added more systems linked in this way - another two in New York, one in Florida (serving South America), and two in Singapore (serving the Far East).

The second major developmental step was to link these Comet system to electronic mailbox systems supplied by other vendors. To do this would ideally have been done using the CCITT X.400 series of standards. However, at that time (and it may still be true today) we felt that the standards were not well enough defined to be immediately implementable. What we did therefore was to develop our own somewhat less ambitious standards and had these implemented on three systems: Comet, Datapoint's EMail, and DEC's All-In-One. As a result of this we now have 2,000 EMail users and 500 All-In-One users linked in with the 14,000 Citimail users. The linking involves complete commonality of directories, so that all users in the electronic mailbox "club" have the illusion that they are all on the same system.

The "pre-X.400" standards that we developed to link together different vendors' systems, when measured according to numbers of pages, were 10% to do with exchange of messages between systems, and 90% to do with directory synchronization. The synchronization of the directories across all the systems is the most difficult task. In this respect I think we are some way ahead of X.400. Attention to directories and addressing problems between systems is a vital aspect of linking systems together. I will say more about addressing in a moment.

Users' reaction to electronic mailbox

From the first months of the pilot it was clear that people enjoyed using Citimail. There quickly emerged a style associated with using the system - one which was informal, and in which typos were acceptable. The medium solved the problem of getting hold of people by telephone, without the undesirable aspects of voice mail. Two things that I think made people feel more comfortable reading an electronic mailbox message than listening to a voice mail message are (a) people have no expectations of a terminal, whereas they expect a telephone to let them talk to another human being; and (b) when reading a message on a terminal people can read and absorb the message at their own speed.

Surveys that we have conducted from time to time show some interesting things about how people use Citimail, such as:

- The average message length is about 8 lines. Most messages convey a few simple facts or ask a few direct questions. Messages tend to be more a substitute for a telephone call than a formal memo.

- Printing out messages is rare. (About 1 message in 10 is printed.) Most messages are dealt with there and then on the screen: a quick reply, a note on a "to do" list, or a date in a diary.

Comet's strong points

The surveys we have carried out also throw light on the features of Comet which are most useful or which contribute to Citimail's acceptability as a communications medium. Comet is a system that is fairly easy to learn, having only 14 command "verbs" (like Compose, Scan, Read, Send, etc). It maintains a "chrono" file of old messages you have received and sent, and it lets you create additional files in which to place messages on specific topics for later review. Each received message can be immediately answered or forwarded to someone else if required.

The most important features for users turned out to be:

(1) Addressing by "real names".

(2) Confirmation of "To:" and "CC:" lines after you type in a name - so you know you have got the right person.

(3) The "answer" facility.

(4) The "forward" facility.

I believe that the use of "real names" was critical to the success of the service. If we had adopted a system that required addresses like "73:THX1138" to be looked up in a directory and typed by users, then I do not think that the service would have caught on as it did.

When the user population expanded beyond 8,000 we had to compromise the "real name" addressing to some extent. We retained the use of people's real names and added an "extension" in brackets consisting of a city code and organizational unit code. For example:

John A.B.Smith (APTYO:FINCON)

means the John A.B.Smith in Citibank Tokyo working in the Financial Control group. "AP" is a region code (Asia/Pacific), "TYO" is the IATA code (airport code) for Tokyo, and FINCON is a readily understood Citibank abbreviation. We used the IATA codes to keep the extension as short as possible while using something that many people are at least vaguely familiar with. The region code was added to provide a clue as to where the city might be in the case of some of the more obscure IATA codes. (The other regions are: EU=Europe, ME=Middle-East, AF=Africa, US=USA, CA=Canada, CS=Caribbean/South America.)

As illustrated by the John Smith example, we also get as many middle initials as possible from users with the more common names. A user cannot be put on the system unless his or her name plus extension forms a unique combination. If there happened to be two John A.B.Smiths working in Financial Control in Tokyo, one would have to use a

nickname as a middle name to resolve the ambiguity. In database jargon, the Citimail name is a "forced key".

Because the thing in the brackets is somewhat user-unfriendly, we had Comet customized to work in a way that avoids the need to type the "extension". (If you really want to you can type the extension to anticipate an ambiguity.) In composing a message you normally type only the real name. If this turns out to be ambiguous you will be given a list of matching names (with extensions) and asked to choose one (by typing the item number of the one you want). If the name is unique to start with it is accepted immediately. (As mentioned above, in either case the name is "echoed" back to you, complete with extension, to assure you that you have got the right person.)

I cannot stress too strongly the importance of adopting a natural or near-natural addressing scheme for electronic mail. I believe that public electronic mail will make slow progress until this problem can be solved outside the individual company.

Future plans

Our immediate problem is just coping with growth. We now have nine Comet "nodes" (i.e. computers running the Comet software), each holding about 1,600 mailboxes - a limit determined by the number of ports that a DEC 11/70 can handle when running the Comet software (about 64), which in turn determines how many users can be handled. If half of Citibank staff worldwide eventually join the service then we will one day need 20 nodes. In addition, business units that are implementing their own systems (like DEC All-In-One systems) are pestering to get connected into the "club". Each new connection involves weeks of careful testing.

On the whole, users are content with the set of features now offered by Comet. The only major enhancements that we have asked the vendor to work on are (a) an "on holiday" feature, whereby you can tell the system you are going on holiday and it will send an automatic reply to each message that is sent to you saying "This message arrived in the addressee's mailbox but will not be seen by the addressee until his/her return from holiday", and (b) user-created distribution lists.

At present the System Administrator sets up distribution lists with names like "Electronic Mail Committee". Users type in this list name along with individual users' names and the message goes to all "members" of that list. However, it takes a day or so to get a new list set up, so many users would like to be able to create their own lists. We are going to make this possible, although the list names will be private to their creators and will be expanded by the system to the names of all the list members when the message is sent. (This overcomes the problem of two users giving the same name to two different lists.)

Lessons to be learned

The success of Citimail is, I believe, due to a number of factors that are not specific to Citibank, or at least are achievable in any company given the will to do so:

- A simple, no-nonsense software package (Comet).
- Sticking to "real name" addressing at all costs.
- The System Administrator clamped down on junk mail whenever signs of it emerged.

However, there were two factors that are unique to Citibank and other large multinational corporations, and may not therefore apply in other companies:

- The added benefit of electronic mailbox, used between countries, in overcoming time differences (which hamper telephone communication).
- Easy access through a private data network, instead of having to rely on a combination of telephone dial-up and public data networks.
- A company culture that somewhat favours new technology.

So, a corporate electronic mailbox service might not be such a resounding success in every company. I hope to hear some contrasting views during this conference.

Presented at:
"Online" Conference on Electronic Mail
London, 19 November 1986