Teldok

February 1985

Reference Document E

Office automation in the US

The development of selected office automation installations

Reported by Richard Dalton

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PREFACE

In December 1981, TELDOK published the first part of each of the selected case stories included in this volume. That report was issued in Swedish and rapidly reprinted to meet the increasing demand in Sweden for information on real-life use of new office information and communications technology -- a demand which, by the way, TELDOK was created to help meet.

Shortly afterwards, Richard Dalton accepted to document what had occurred at each of the office automation sites first visited in 1981. These follow-ups are now fit for publication, this time in English with the original case descriptions. We hope to be able to report more recent and future developments at least once again.

As TELDOK publications primarily are intended for a Swedish audience, we have added transcipts in Swedish from study visits made by the Swedish Commission for Informatics Policy ("Datadelegationen") in February 1983 -- at TRW, Davis Polk, and the Hanscom Air Force Base. The data in this publication furthermore will be presented in a condensed and commentated Swedish-language volume, also discussing office automation trends in Europe and Japan, which is due to appear in the fall of 1985.

We hope you will find the material contained in this Reference Document interesting.

Bertil Thorngren
Chairman, The TELDOK Editorial Board

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OWENS CORNING FIBERGLASS

Located in Toledo, Ohio, Owens-Corning produces glass fiber thermal and acoustical insulations, roofing, pipe, building supplies, asphalt, and glass fiber reinforcements for various uses. They employ 23,800 and show sales of $2.37 billion.

Contact: Bill Whitten, Manager, MIS Planning
Address: Fiberglass Tower, Toledo, Ohio 43659
Phone: (419) 248-7136

January 1981

1. APPLICATION

An electronic mail and message system. Software is the Infoplex package provided by Compuserve, Columbus, Ohio (contact familiar with project at Compuserve is Clark Woodford, Regional Marketing, (614) 224-3113), via dial-up telephone ports. Owens Corning buys or leases its own terminals, using Texas Instruments Silent 700 series as portables, Decwriter 34 models in factories, and CRTs (cathod ray terminal) from various makers, as well as communicating word processors, in offices.

2. SCOPE

There are 300 terminals, with an average of 1.5 users per terminal. Both figures are expected to rise; new terminals are being installed at the rate of about 30 per month.

User categories include members of the MIS department, company pilots (who use it to file flight schedules and passenger lists available to everyone in the company), sales personnel (who use it for sales call reporting), technical people, and employees of the Roofing Products Division, who recently began to use it for messages, orders and invoices, created on-line and fed every 20 minutes into Owens Corning central computers for billing, inventory control and accounts receivable. This application has been in place since a pilot program was launched in December, 1978.

3. REASONS FOR APPLICATION

It was promoted by Compuserve, and selected by Owens Corning in recognition of serious cost control and management time problems associated with telephone usage.

4. TYPES OF ANALYSIS PERFORMED

A six-month pilot project was quantitatively analyzed. Message costs from the initial 40 terminals were calculated, including service costs (various long distance charges, such as Wide Area Telephone Service charges, wholesale rates for heavy users) and people cost (management time, on the average, costs 50 cents per minute). When factored with the study by SRI International which showed that only 28 percent of all attempted calls are completed without a busy signal or callback, the "communications unit cost" was estimated at $17, compared to $3.50 for a 600 word Infoplex message (six minutes of management time, and a service cost of 50 cents per message, Infoplex flat-rate charge), savings were calculated on the basis of each professional "replacing" four calls per day with messages. The firm estimated 1500 of its 6000 professionals could use the system, reducing costs $54/day each.

5. POST INSTALLATION EVALUATION

100% of respondents to a post installation survey said their productivity increased. The sales department said they could get by with fewer people.

July 1982

Owens Corning continues to use Infoplex from Compuserve on a dial-up basis. There are now 1000 users, with 1.5 users per terminal, and the average sign-up rate of 30 new users per month continues. Texas Instruments 940 personal computers and Sidereel smart terminals are now the most common terminal devices. The Roofing Products Division continues to be pleased with the performance.

The next function to be automated will be the special approval request. Special Approval Requests - SARs - come from firms wanting to buy Owens Corning products. At present, these SARs are originated at the Customer Service Center, where an order is placed. They are sent to headquarters in Toledo, where the Marketing Manager reviews and prices them; his pricing is reviewed in turn by a superior and an answer is then sent back to the field. Using a forms capability recently added to Infoplex, work is proceeding quickly on this new application.

Usage has increased tremendously, with many travelling personnel entering their itineraries and vacation schedules. The system is also very popular with Corporate Engineering. Most officers don't check their own electronic mailboxes, but rather delegate the task to their secretaries, who check them as often as four times a day.

ARCO

Arco (Atlantic Richfield) specializes in petroleum and natural gas: exploration, development, production, purchase, transportation, sale, marketing. Revenues are currently $28.75 billion, and they employ 54,200 worldwide.

Contact: Gus Morck, Manager, Telecommunications
Address: 515 South Flower Street, Los Angeles, California 90017
Phone: (213) 486-2013

February 1981

1. APPLICATION

In 1981, Mr. Nuwer, Manager for Planning and Education of Electronics and Telecommunication, is responsible for Arco's extensive telecommunications network, especially in the area of planned videoconferencing facilities and other office automation uses.

2. SCOPE

"Arconet" is described as the "largest private communications network" in the world. (Interestingly, Citicorp also makes this claim.) An example of their capacity is the 300 microwave channels they have built between Chicago and Houston. Arco prefers, wherever possible, to construct their own facilities rather than use public carriers. They have leased a full transponder capacity from a commercial satellite service and are now constructing earth stations nationally to receive their own satelite transmissions. The videoconferencing application will link Los Angeles, Dallas, Chicago, Washington, DC, Philadelphia and New York initially.

3. REASONS FOR APPLICATION

Mr. Nuwer does not believe that videoconferencing necessarily reduces travel as is commonly said to be a justification for this technology. Arco is pursuing this because, as an energy company, they see that travel will not be an option in the future, as it is now. Rather, travel will either be limited by unavailability of petroleum or prohibitively expensive.

4. TYPE OF ANALYSIS DONE

Arco staff have gone into all available techniques for compression of video signals, realizing that telecommunications requirements for extensive use of video are staggering. They decided it would be necessary to provide an internal research projekt in this area, which is now underway in partnership with Ericsson of Sweden.

5. ESTIMATED COSTS

Cost figures are a closely guarded area. It was indicated that published estimates of $20-30 million are "too high".

6. POST INSTALLATION EVALUATIONS

Arco plans to do both quantitative and qualitative analysis after video has been in use for 2-3 years.

7. COMMENTS

Heavy emphasis has been placed on human reactions to this new communication medium. Arco expects it to be only one of the tools available to people via future telecommunications offerings. They have found it necessary to develop their own video expertise since consulting firms did not provide comprehensive help in a business environment.

July and November 1983

The first four sites (Los Angeles, Denver, Houston, and Philadelphia) were planned to become active at the end of July. Another three sites (Washington D.C., Dallas, and Anchorage) should be added by the end of 1983. Cost of the system is estimated at $5 million. Based on the experiences of other companies, Richard Dalton at Keep Track Suspects this is too low.

After installation is completed, users of the system will receive critique forms for a later analysis.

Arco has not implemented computer conferencing as of yet. Electronic mail and high-speed fax systems are in operation now and undergo constant upgrading. Although Arco is implementing these marvelous space-age machines, the manager himself refuses to use his electronic mailbox; his secretary has to pick up his messages for him.

In a November conference on Office Technology, "Arcovision" was presented. Arco had at that time built a conference room in each of there six main regional centers, for about half a million dollars per site. Each room seats six persons, and the screen is life size. There are two cameras in the room, each taking pictures of three participants. The sites also have special graphics cameras and telefacsimile. Signals are scrambled, and the rooms are soundproofed. Other users may lease the system for about $1000 an hour.

TRW

Based in Redondo Beach, California, this large aerospace company produces spacecraft and propulsion products as well as car and truck products. TRW has 97,935 employees and sales in excess of $5 billion.

Contact: Terry Savage, Manager, Advanced Development
Address: One Space Park, Redondo Beach, California 90278
Phone: (213) 517-8322

January 1981

1. APPLICATION

This is a pilot program to explore many aspects of office automation in a controlled "laboratory" environment. TRW has installed standard cable TV coaxial cable in this unit and will add terminals to the system. The basic computer system is a Prime 650.

2. SCOPE

The system will initially support electronic mail and computer-based conferencing. A number of different terminal types will be used to test the utility of different types, ranging from "dumb" to intelligent and including telephone equipped terminals of the "telematique" type. The local network uses an interface that TRW developed. Software used is Prime's office automation system, which will be heavily modified by TRW based on their experience with it. The project is limited to 40 employees in the systems department to maintain maximum control over the results.

3. REASONS FOR APPLICATION

TRW was unable to find a complete office automation system, satisfactory to its own needs. This lead to a decision to start with a Prime system and to use it as a test vehicle and base for development of their ultimate internal system. TRW may also have an interest in developing their own systems products based on the results of this project.

4. TYPE OF ANALYSIS DONE

Not known at this time, other than an extensive survey of product offerings.

5. ESTIMATED COSTS

These are not available from TRW but the estimate offered by Open Systems is in excessive of $1 million to fund this pilot (and actual costs may be much higher).

6. POST INSTALLATION EVALUATIONS

TRW will do random evaluations of the users as they work to determine what system features are used, how frequently and for how long, and to obtain user reactions to the system's ability to improve employee effectiveness. The system is designed to monitor internal activities to account for transaction types used and frequencies of use.

7. COMMENTS

This project is part of TRW's so called SAFE project, reported to be the world's largest office automation project. It will be expanded beyond its initial functions to include videoconferencing (1982) and eventually link to corporate data processing facilities. At present, there are no plans for support of information access from commercial information services other than by dial-up.

This project is one of the most carefully structured Open Systems staff have seen and promises to provide interesting information as it progresses.

Besöksrapport från Datadelegationens besök vid Thompson, Ramo and Woolridge (TRW) Inc. den 25 februari

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OM FÖRETAGET

TRW är ett mycket stort företag inom elektronik och försvarsområdet. Inom elektronikområdet ligger tyngdpunkten på utveckling av mjukvara.

LOKALT DATANÄT

TRW har utvecklat ett eget lokalt datanät (LAN). Syftet med projektet är att höja produktiviteten på kontorssidan, främst bland chefer. Man eftersträvar en lösning som tillåter inkoppling av olika slags utrustning samt att man kan ta utrustningen med sig vid rumsbyten.

En centraldator från Digital används för närvarande. Syftet är att senare sprida lokal datorkraft till de olika användarna. Ett kabelnät baserat på kabel-TV (CATV) används för dubbelriktad kommunikation.

De viktigaste funktionerna som skall finnas är

1 Elektronisk post. Varje användare skall kunna skicka, ta emot och bekräfta meddelanden. Även multiadressering är möjlig.

2 Ordbehandling med tonvikt på editering.

3 Tidplanering med en personlig kalender för alla samt möjligheter att sätta ut tider för sammanträden.

4 Telefonkalender.

5 Personlig databehandling, t ex finansiell kalkylering.

Som ett absolut krav fastställdes att systemet skulle vara mycket lätt att använda.

Projektet inleddes 1981 med en förstudie. 40 chefer ingick i en studiegrupp. Man fick redovisa sin tidsförbrukning på olika arbetsuppgifter. Resultaten jämfördes med direkta observationer, varvid avsevärda differenser framkom. Bl a redovisade cheferna 7 % för administration - den faktiska observerade andelen var 24 %.

Deltagarna i studiegruppen försågs med var sin terminal och erhöll en kort utbildning. Statistik har förts över användningen. Den mest använda funktionen är elektronisk post (65%). Det har visat sig vara ett snabbt och effektivt hjälpmedel att kommunicera mellan chefer. Ett antal rapporter har kunnat avvecklas. Även tidplaneringssystemet används flitigt. Ordbehandlingsfunktionen används främst för uppdateringar. I genomsnitt har systemet sparat 1,3 timmar per dag fördelat på:

- kommunikation 0,9 tim (5,6 - 4,7 tim)
- skrivbordsarbete 0,4 " (2,4 - 2,0 tim)

Som ett krav på ett nätverk framhölls att det måste ha hög kapacitet, vara tillförlitligt och ha stor spridning. Olika slags utrustning skall kunna kopplas till nätet, såsom datorer, terminaler, video, telefon och skrivare.

Nätverket består av tre huvudkomponenter:

o kommunikationsmediet, som kallas BUS

o nätverksinterface, som kallas BIUs (Bus Interface Units)

o BIU Expansions.

IBM

IBM (International Business Machines Corporation) products include: data processing machines and systems, telecommunications systems and products, information distribution and office systems, and office equipment. Headquartered in White Plains, New York, they employ 354,936 and earn over $32 billion yearly.

Contact: Bert Muldow, Senior Staff Member, IBM Systems Research Institute
Address: 205 E Street and 42nd Street, New York, NY 10017
Phone: (212) 983-7234

January 1981

1. APPLICATION

IBM's "V-net", used for data communication and electronic mail/messages.

2. SCOPE

Links more than 300 large-scale computers for file transfers and for messaging. None of the Sales Offices is included. Large IBM customers also have access to V-net.

The actual number of characters transferred daily is 3 times that carried on Telenet (Telenet is a publicly available value-added, packet-switched data transmission and messaging network).

3. REASONS FOR APPLICATION

To provide reliable communications facilities, primarily for data transfer; the electronic mail part is an add-on to this need.

4. TYPE OF ANALYSIS DONE

Each major application or user is evaluated on a cost/benefit basis compared to other communications options before it is added. IBM management only recently realized this network had become so comprehensive.

5. ESTIMATED COSTS

Not available.

6. POST INSTALLATION EVALUATIONS

There is no indication that costs are charged back to users of the network. Belief is that it would cost more to bill than it would be worth. There has been little apparent evaluation of the overall network.

7. COMMENTS

With the basic network in place, it is expected that Sales Offices will be added. Also, teleconferencing is being considered via the network.

July 1983

IBM's "V-net", which supports file transfer and interactive terminal traffic, is in a state of continual expansion. It encompasses more than 1000 nodes as of spring 1983 and is adding sales offices, many of which are already linked to the system. Currently IBM is constructing a backbone network of nodes to extend internationally.

There are two computer conferencing systems within IBM, one on the V-net and one on the Corporate Consolidated Data Network (CCDN). Their in-house "Profs", a host-based electronic mailbox, is available to branches, also through the CCDN. It has no voice component. "Profs" is an IBM software package deigned to run on IBM's own large-scale mainframe computers. Besides electronic mail, "Profs" includes the ability for each user to create his own files and has electronic calendaring.

To the two functions of image and data transmission, IBM could add voice but have not as yet and have no definite schedule for doing so. Pressed for details, V-net Project Manager Larry Smith said that while the technology is available to produce a voice storage and forwarding system, the problem is to integrate it into a practical, economic package.

STANDARD OIL OF CALIFORNIA

With headquarters in San Francisco, Standard Oil's worldwide operations produce gasoline, jet fuel, lubricating oils, asphalt, and natural gas. The company has earnings of $46.61 billion and 43,000 employees.

Contact: Bob Ellison, Senior Analyst, Office Automation Systems Staff
Address: 225 Bush St, San Francisco, California 94111
Phone: (415) 894-6237

January 1981

1. APPLICATIONS

Two pilot programs are underway, one in communicating word processing, another in electronic mail. The word processors are from Xerox and use Ethernet.

2. SCOPE

Two different groups of people are involved in the projects. Scientists at the Chevron Research Center are using the electronic mail system, while clerical personnel at two headquarters buildings in San Francisco will use the communicating word processors. Both pilots were begun in late 1980.

3. REASONS FOR APPLICATION

The problem Standard Oil recognized was a shortage of geologists and geographers - the company cannot find and keep enough of these professionals to meet the company's needs. One reason, the company found, is that much professional time is taken up with such clerical tasks as filing and routing mail. Effectiveness improvements are expected.

4. TYPE OF ANALYSIS DONE

The Office Automation Systems Staff firmly believes in qualitative analysis rather than quantitative analysis. They believe secretarial and managerial perceptions of job enrichment and improved performance are more important than any number-based judgment.

5. ESTIMATED COSTS

For the two pilot projects, and others that will be launched during the next two years, the section expects to control a budget of $10 million.

6. POST INSTALLATION EVALUATIONS

Both pilots are too new for post installation evaluation.

7. COMMENTS

Standard Oil of California's approach, which gives a centralized office automation staff absolute control over what types of OA equipment the firm can buy, is typical of large American corporations at this time; they preach decentralization, but in the end, everyone must use the centrally approved set of solutions. Also typical is the cautious approach involved in calling everything a pilot - although Standard's selection of Ethernet for its internal communicating word processor network gives that local networking scheme a toehold in the very competitive and still evolving network market.

July 1983

Former contact Joe Dresher has been replaced by Bob Ellison, who reports that the 1980 projects exploring electronic mail (Chevron research center) and communicating word processors (world headquarters) are out of the planning stage.

At present four to five computer-based messaging systems are resident on an IBM mainframe computer, some using packaged software and others using programs developed in-house.

There are 70-80 communicating word processors (Xerox 860) operating worldwide to provide exchange of documents among Standard Oil branches (in Europe, the United Kingdom, Alaska, and the continental U.S.).

According to Ellison, there is quite a bit of excitement about this development, as it eliminates U.S. and international mail as well as slower courier service, for documents which can be keyed. Asked about evaluation of the system, he said Standard Oil has never justified word processing on the basis of electronic mail; the latter is just added "gravy".

Standard Oil is interested now in "distributing the word processing environment", getting away from centralized workstations. Ellison complained about turnaround time involved in sending out work to a word processing department which might be in the next building, rather than to a secretary down the hall. (Until recent years Standard Oil employed no female secretaries to support executive personnel. Women generally could not hold a position above stenographer.)

Use of microcomputers is increasing, with 4 vendors "on the recommended list": the IBM PC (Personal Computer), Xerox (820, soon to be the 16-8), Apple, and Hewlett-Packard. Although these are presently stand-alones, the next experiment will be to link up the Xerox 820s to Ethernet for communication. This does not mean that other micros (incompatible with Ethernet) will be phased out, since these microcomputers are valuable as stand-alone processors and meet differing needs. Scientists and geologists, for example, prefer the Hewlett-Packard micros, the primary application of which is producing spreadsheets, and thus are not needed for communication.

CHRISTIAN SCIENCE CHURCH

This nonprofit society publishes magazines and books as well as the highly regarded Christian Science Monitor, a daily newspaper providing in-depth coverage of world events.

Contact: Alma Ragnow, Word Processing Specialist, Information system

Address: Christian Science Church Center, Boston, Massachusetts

January 1981

1. APPLICATION

A shared-resource word processing system.

2. SCOPE

Equipment was decided upon in January 1981: a Wang system with 20-30 terminal support capacity. This system will be used for letters (both standard and individually authored) for both the newspaper and the church - in effect, an automated "typing pool".

3. REASONS FOR APPLICATION

Improved cost and responsiveness to correspondence.

4. TYPE OF ANALYSIS DONE

A lenghty comparative evaluation was done by data processing and administrative people. The emphasis was on costs, performance and functionality of the hardware and standard word processing software.

5. ESTIMATED COSTS

Not known.

6. POST INSTALLATION EVALUATIONS

No formal evaluations planned.

7. COMMENTS

This application is typical of many that are being initiated. There has been little consideration given to use of the

equipment for anything besides "classical" word processing and communications.

Since there are programs underway in other parts of the organization, to explore minicomputer support for personnel/ payroll activities, to develop a language translation system for publications (already in the prototype stage), and to produce an electronic edition of the newspaper, it appears very short-sighted to leave these considerations out of the word processing decision. The question of communications (especially with the Digital Equipment system that has mail lists that word processing could access) was addressed after (!) the word processing equipment was decided on. Fortunately, the Wang system can communicate in this manner.

July 1983

Former contact Bob Reiman introduced Alma Ragnow as someone better able to talk about the Wang system than he. Her first comment was, "We've come a long way since 1981!"

The Church now has 8 CPUs, 150 work stations, and 58 printers in its headquarters (publishing house & administration center) in Boston. For the past year the printers have been interconnected to allow communication between the two operations areas, which are separated by 4 city blocks. The system is used extensively for correspondence, reports, and list processing, and this year it reduced production time of the annual budget from days to hours.

Turnaround time has been reduced typically from 7-10 days to 3, with a significantly greater volume of work produced, and staff has been reduced through natural attrition. A cost study is in process, but figures are not yet available.

Although workers experienced initial anxiety over implementation of the system, now the typical reaction (according to Ms. Ragnow) is: "I'll give up anything, but don't take my Wang away!" Evidently the Church has contributed to this enthusiastic response by making special efforts to acquaint workers with the system. Monthly in-house classes have trained 500 people (including managers, who use the processor for editing or originating corresondence) in the use of Wang equipment. The Information Systems Department, with a staff of 4, maintains a "hot line" which offers not only emergency assistance for problems, but also offers advice on how to get maximum benefits from the Wang systems.

PACIFIC MUTUAL LIFE INSURANCE

Based in southern California, Pacific Mutual earns $687 million in annual premiums and employs 2,400. They provide life, accident, and health insurance; pension plans; and investment management services.

Contact: Clark Hayes, Second Vice President (1982)
Address: 700 Newport Center Drive, Newport Beach, California
Telephone: (714) 640-3011

January 1981

1. APPLICATION

Pilot project to determine the impact of electronic mail/ messages, automated maintenance of calendars and schedules and the availability of some calculating facilities on managerial and professional employees.

2. SCOPE

Project is in the future as the equipment selection will be made in the next 60-90 days. Pilot will be limited to 20 terminals and all of these will be located in the Information Systems Department.

3. REASONS FOR APPLICATION

Like most insurance companies, Pacific Mutual generates tremendous amounts of paper and a primary focus for this experiment is to see if "we can reduce the amount of papers". The Information Systems Department was selected as these employees were felt to be "more tolerant" of the introduction of automated support and that "better control" could be maintained over the project.

4. TYPE OF ANALYSIS DONE

No formal studies were performed of work content or timings. The pilot project is based on the subjective opinions of study team members from Information Systems and administrative sections of the company.

5. ESTIMATED COSTS

Cannot be determined at this time.

6. POST INSTALLATION EVALUATIONS

They will "look at" the pilot system users to determine their usage of various parts of the system. No structured studies are planned nor are any monitoring features being developed to allow the system to account for usage.

7. COMMENTS

This approach has some merit as a pilot program but is hampered by the lack of definitive planning and evaluation techniques. It is described as a "let's try it out and see what happens" approach.

Expansion of the pilot outside the Information Systems Department would have been useful as it would give a better indication of non-technical employees' reactions and suggestions. As the project stands, it will result in information that is not only highly subjective, but based on the opinions of technical personnel.

August 1982 - February 1983

Pacific Mutual completed their comparative evaluation of a number of hardware options and decided to go with IBM's 8100 distributed processing system with terminals. Reasons for this selection included the 8100's ability to communicate with their IBM 3081 mainframe computer and the relatively poor service and support they have received from Wang on a number of units installed in field offices.

They still consider this a pilot project as it has not been installed outside of the Information Systems Department, but they are beginning to apply the systems to a number of applications and are even offering to key enter other department's work in areas like budget preparation and for production of computer-generated letters. This means that the two 8100 computers (equipped with IBM's "DISSOS" software) act as a kind of internal "service bureau" for office-oriented tasks.

The 8100 systems have 50 terminals currently attached. However, Pacific Mutual has yet to try out any interactive systems, such as electronic mail, though they are creating performance evaluation files that track items like their management by objectives program. They plan on adding Displaywriters shortly to test out both local word processing and personal computing via the Displaywriter's ability to run CP/M-86 programs. CP/M-86 is the most popular operating system in the U.S. for 16-bit microcomputers. Making it available on the Displaywriter means you can use a very large

number of programs, not just those provided by IBM. Examples are electronic spreadsheet programs (like VisiCalc) and data management systems that perform personal record keeping for the individuals using the system.

The Displaywriter is an IBM stand-alone word processor that has been available for about two years. Recently, IBM has provided communications software that permits a Displaywriter to communicate with an IBM mainframe computer, but the Displaywriter operates in normal mode using its own microprocessor - it is very much a personal computer, only oriented toward word processing.

Pacific Mutual has investigated voice mail and believes the VMX (formerly ECS) system is much better than IBM's or Wang's. They believe voice mail to be a very useful concept but cannot proceed at this time due to budget limitations.

Pacific Mutual has implemented what they describe as a "fully automated" system for support of "health claims payment", based on use of large-scale IBM computers and a terminal network, and this has been able to cut the claims staff considerably. The automated health claims system is not part of the distributed processing network that is based on the IBM 8100 systems. Instead it is a terminal network (similar to an airline reservation system) tied directly to the main computer by communication lines. Different people (called health claims examiners) use it to help determine the benefits that are payable for a person's health insurance expenses by accessing the central computers files and using the programs available to perform calculations and to issue benefit checks which are then mailed.

Health care in the U.S. is provided in most cases a a private service between individuals and doctors, pharmacies, hospitals and other health care providers. Payment is made through private insurance plans (most often, a "group health plan" at least partially paid for by the employer). This creates a significant headache. Doctors must complete forms and bills then send these to the insurance company for reimbursement. The insurance company has to check that the individual is eligible for coverage, what the benefits are under the specific plan covering the individual (these are variable and can include a number of major differences from one plan to another) and then apply the benefits to the charges received. Many large insurance companies are still doing a good deal of this laborious handling on a manual basis - especially those insurers with national operations.

Pacific Mutual continues to move cautiously (like most large companies we have talked to) and is making some unexpected progress in their operations. They expect to make a good deal more progress if general economic conditions improve and allow larger budgets for this purpose.

BANK OF AMERICA

A subsidiary of Bankamerica Corporation., with world headquarters in San Francisco, Bank of America provides full service commercial banking all over California (branches in nearly every small town) and worldwide. With 74,106 employees, the show deposits of $89 billion.

Contact: Frank West, Department Manager, Telecommunications Engineering and Operations
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Phone: (415) 624-4327

January 1981

1. APPLICATION

The project is a prototype videoconferencing system, using studios at the two head offices of the bank in San Francisco and Los Angeles (450 miles apart), with a third studio planned for the largest sub-office in New York City. Standard television equipment will be used to feed a leased satellite channel.

2. SCOPE

The system is scheduled to go into operation during the fourth quarter of 1981, and will initially involve several hundred people in the San Francisco and Los Angeles Data Centers, as well as the Management Committee (which runs the bank) and the Loan Committee (which decides whether or not to make major loans). These two committees hold split-city, SF/LA meetings with a voice-only link at present. Eventually, several thousand people who presently fly regularly between the two Californian cities are expected to participate.

3. REASONS FOR APPLICATION

This was selected as the first step into office automation as it seemed to offer the most immediate and tangible payoff. There was a recognized problem of skyrocketing air fares between the two headquarters cities, along with lost time spent getting to and from remote airports. Users said they believed travel was a problem and that phones and audio links were an inadequate solution.

4. TYPES OF ANALYSIS

Four months of research went into cost-justification of the project. Users were interviewed and travel records were checked to select the most likely users - with the result that the DP centers were selected.

On the basis of air fare and hotels alone, not counting lost time and salary costs, replacement of 10 percent of all travel by teleconferencing could save $6.6 million. Project payback is estimated in 16-48 months, depending on usage.

5. ESTIMATED COSTS

Ground hardware will be $400,000 per site. Satellite link rental cost is unknown. Hourly intrabank charge for usage is estimated at $15.

Costs of the preliminary study were not considered significant, and the user survey was, simultaneously, an opportunity to "sell" users on the idea.

6. POST INSTALLATION EVALUATION

Not structured at this time.

7. COMMENTS

This seems to point out an overwhelming advantage for using videoconferencing, at least in a company of considerable size. What is missing (and may be the key to success) is a careful way to evaluate use of the new facility.

July 1983

The videoconferencing system prototype was dropped soon after January 1981. The bank has no further plans to implement a videoconferencing system; it was felt that costs at present are too great to justify the project.

MIT, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Located in Cambridge, Massachusetts, MIT is the most prestigious technical university in the United States. It is a private institution but, of course, nonprofit.

Contact: Dr Richard Solomon, Researcher on Communications Policy
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Phone: (617) 253-3124

January 1981

1. APPLICATION

Researchers in this unit all have terminals at home and work at home extensively. They have 24-hour access to the mainframe computers at MIT and, through the Arpanet (a value-added, packet-switched data communications network), to a wide variety of data bases.

2. SCOPE

Users regularly draft reports, schedule meetings and send electronic mail/messages using the Arpanet facilities. A unique data base retrieval system has been developed to coordinate with the Stanford University SAIL system that provides access to multiple electronic news services (including AP, UPI and London Daily Times). This MIT access methodology allows a user to define by extensive keyword functions the information wanted on an on-going basis. That particular information is regularly searched for in a number of data bases and stored for later retrieval by the user. Special search codes and routines required by each data base are transparent to the user, that is, the user need not bother about different routines and protocols.

3. REASONS FOR APPLICATION

To provide a way for employees to work at home, reducing the need for commuting to the office, and to provide a way for staying in touch while traveling.

4. TYPE OF ANALYSIS DONE

No formal evaluations were done. This has been a gradual implementation process with each researcher adding capabilities and others adopting them after seeing he advantages.

5. ESTIMATED COSTS

No cost figures are available. Because this is a research program, the bulk of the communications costs are not charged for. A guess of the relative cost for communications per employee in a commercial enterprise would be about $200 per month.

6. POST INSTALLATION EVALUATION

Has been qualitative but quite interesting. Most of the researchers work is now performed out of the office. They believe they work more hours and on a different basis. Researchers feel there is a great need for a highly qualified "peer" to provide in-depth technical assistance on the system's facilities. Finally, the dependence on a functioning terminal has caused each employee to find alternate (redundant) ways to keep working in case one or more computer facilities is not in operation.

7. COMMENTS

The system used and its affects on employees should be of great interest to companies wanting to experiment with the home as a regular work place. The staff at MIT is basically technically-oriented, but the motivation of being able to work in this type of situation should be a strong one even for non-technical workers.

July - August 1982

Use of computers at home by staff members of the project continues, although they do not consider it to be an experiment or research project, but rather a normal way of working. There are presently 13 participants in the research program on Communications Policy at MIT. Of these, seven are research associates and six are graduate students.

The biggest change since the last report has been the trend towards use of micro-computers, rather than dumb terminals, for at home work. This has considerably reduced the $400/month average phone bill of project members. Not all of them are using micros at this point, but Richard Solomon is - in his case, an Apple. There is also an Apple at his office at MIT as well as a half-dozen Superbrain computers in the department. Solomon is upgrading from a 300 baud modem to a 1200 baud modem, so as to be able to send more messages more quickly. (Roughly, baud corresponds to bits per second - the information transmission capacity.)

Solomon has found that a micro computer paid for itself in reduced phone charges in eight months. His mainframe use is now limited to electronic mail, database access, and remote printing on a Xerox 9700 page printer. His group expects to eliminate the electronic mail use of the mainframe by installing a dedicated micro soon.

One graduate student has an Apple computer at home, the rest use terminals. Two associates use micros at home and terminals in the office; one associate uses a micro in the office and a terminal at home. Thus four of 13 participants are using micros. Richard Solomon suggests that the popularity of micros is growing rapidly because of their ability to reduce communications costs, and says he believes all participants would have micros at home - instead of terminals - within a year.

A project is underway at MIT to add a local area network (LAN) to an existing campus-wide cable television system. It will be a broadband network, designed by MIT, rather than a commercial network.

BANKER'S TRUST

Banker's Trust New York Corporation is a bank holding company with gross operating earnings of $4.66 billion and 12,000 employees. Subsidiaries: Banker's Trust Company, Banker's Trust Company of Hudson Valley, N.A., and Banker's Trust Company of Western New York.

Contact: John Wilson, Computer systems,
Phone: (212) 850-4269 and (212) 775-4335

January 1981

1. APPLICATION

Electronic mail (pilot project).

2. SCOPE

30 management people in both U.S. and international consulting opertions.

3. REASON FOR APPLICATION

To increase speed and effectiveness of management communications.

4. TYPE OF ANALYSIS DONE

Nothing formal - basically a decision by two members of management to experiment with electronic messaging capabilities and impacts.

5. ESTIMATED COSTS

Banker's Trust used the NJIT (New Jersey Institute of Technology) electronic information exchange system, EIES (a computer conferencing system). Banker's Trust had 15 accounts which equals $60/month per account plus $5/hour connect time on telephone, and would probably not exceed $2,000/month for all participants. Perhaps terminals were already available to staff.

6. POST INSTALLATION EVALUATION

More participants have been added to pilot system.

7. COMMENTS

While the project looks successful, Brad Worthington, in charge of the project in 1981, does not think that EIES is presently a commercially useful electronic mail system. He would prefer using one of the commercially oriented networks such as Telenet or Tymnet. Office automation at Banker's Trust is being put off at present in favor of an extensive study of the subject.

July 1983

Former contact Brad Worthington has left Banker's Trust for Micronet, and John Wilson has not heard of the pilot electronic messaging system which Worthington directed. In his opinion, no implementation has resulted directly from the pilot itself.

During the last two years, there have been two major office automation efforts. The first is a collection of stand-alone word processors, a variety of DEC micros and Philips/Micoms. (Formerly used Vydecs are being phased out - possibly due to Vydec's exit from the marketplace.)

The second effort, under Wilson's direction, is more comprehensive: a Wang OIS system accessing over 250 users (at the NYC International headquarters and on 4 continents) and encompassing electronic mail, filing, calendaring, graphics & spreadsheet capabilities, electronic bulletin boards and office forms production. (A spreadsheet program automates the use of column/row presentations of financial figures, and VisiCalc is the most common brand.) The Wang OIS-system provides access to 8 major banking systems, with interactive access to certain corporate systems and batch access to others. Communication is through Telenet and their in-house "BT-net" (Banker's Trust-net) system.

AMERICAN CRITICAL CARE

This is a medical specialties group located in McGraw Park, Illinois, a subsidiary of American Hospital Supply Corporation of Evanston, Illinois, which employs 34,968 and reports annual sales of almost $3 billion.

Contacts: Joan Fortune, Information Services
Donald Schwartz, Director of Scientific Affairs
Marlene Kozak (1982)
Address: 1600 Waukegan Road, McGraw Park, Illinois 60085
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January 1981

1. APPLICATION

The Information Services Department has created a centralized "information resources file" for the Division of American Hospital Supply of ACC.

2. SCOPE

This system services 225 members of the Division's Research and Development Staff. It provides an information resource for researchers that includes market research reports the company purchases and articles pertinent to the areas being researched. This function was started in 1977. Another major function is the accumulation of internal information used to provide the extensive reporting required by the Federal Government of Health Care Companies. Word processing was added to the system in 1979 but this has not been linked (integrated) to the data base functions. The system operates on a Digital Equipment PDP-11/70 computer that supports on-line access to both the data base and word processing.

3. REASONS FOR APPLICATION

Because of the regulatory reporting requirements, it was believed that a data base approach would insure accuracy in this critical area. The data base of articles and reports was chosen because much generally useful information was not available in a paper form for all researchers. Word processing was added to support report preparation.

4. TYPE OF ANALYSIS DONE

No formal analysis was done before the fact.

5. ESTIMATED COSTS

The division does not have any cost estimates they are willing to release. Richard Dalton, Open Systems, estimates that the computer system costs are $250-300.000.

6. POST INSTALLATION EVALUATION

Qualitative evaluation is an on-going process - no cost/ benefit or other qualitative analysis has been done. Comments include the following:

> Managers and professionals (with a very small number of exceptions) are not using the word processing capabilities themselves. That activity is left to secretarial/clerical employees.
>
> Because of the system, people tend to use brevity in their comments and writings and also tend to save fewer items in the data base than they would in paper files.
> Managers/professionals do not consider integrating the word and data processing capabilities as a high priority item. They are concerned about further changes upsetting their primary job of research.

7. COMMENTS

There is a belief at ACC that optical character recognition (OCR) equipment would enhance the data base input part of the system greatly. They would also like to add a controlled vocabularly function with standardized synonyms to make reports more uniform and understandable.

December 1982

American Critical Care has extended use of its centralized information resource facility to include a "card catalog" of all entries and the ability to create personal data bases with their "Amanda" document storage and retrieval system. Items entered into personal files can be keyed to a security system that protects unauthorized access at a document or file level.

Keep/Track asked for additional information of the Amanda system itself, which Ms Kozak describes as "no a true data base management system, but a bibliographic storage and retrieval method," developed by American Critical Care to automate the laborious task of filing and providing access to internally generated research documentation. It includes an

extensive help facility and is designed for use by non-DP people in the organization. Documents are retrieved by keyword search and Boolean logic can be applied to these search criteria. It is designed to run on a DEC PDP/11-70 and ACC is going to upgrade this system to a VAX minicomputer shortly. The PDP/11 computers currently supports 50 local and 20 time-sharing users with a projected maximum of 150 system users.

A key use for the system is in reporting to the federal government on work in progress. An extensive survey was performed and users felt this single use of the system justified it alone. Questions that typically require days of research can be answered in "seconds" using Amanda. This allows ACC to be viewed as a desirable organization by the government when it comes time for them to compete for new contracts.

This continues to be a good example of the use of electronic storage and convenient retrieval of critical operating information. An unfortunate part of this example is that the Amanda software was developed internally and is not publically available. ACC is considering making this software commercially available, a direction Keep/Track encouraged as there are few similar systems on the market. A major deficit is the inability to link the Amanda files directly with a word processing capability. This is still being examined but budget limitations have not allowed much work in this direction.

BOSTON HERALD AMERICAN

This newspaper is owned by the Hearst Corporation (New York), which employs 9,900 and includes in its operations newspaper, book, and magazine publishing; radio and TV broadcasting; paper manufacturing; news syndication.

Contact: Scott Burns, Financial Editor
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Phone: (617) 738-4281

January 1981

1. APPLICATION

In addition to his responsibilities as Financial Editor, Mr. Burns writes a nationally syndicated column on business and economic trends. He has worked out a method for working at home or while traveling that allows on-going communications with his newspaper and with the company that syndicates his column (located in Des Moines, Iowa).

2. SCOPE

Since neither of the companies he deals with had methods for writers to communicate with them, Mr. Burns selected a Zenith Personal computer system to support word processing and data communications. He uses public network lines to communicate over.

3. REASONS FOR APPLICATION

Mr. Burns wanted to be able to work at home more often, escaping the cost, time and frustrations of commuting to his office. Also, use of mail between his home and Iowa was slow and not too reliable and he wanted a faster and more positive way to transfer his columns to his syndicator.

4. TYPE OF ANALYSIS DONE

Mr. Burns spent more than a year analyzing various personal computers. As a non-technical person, he had to rely greatly on information provided in sales information.

5. ESTIMATED COSTS

The Zenith system (terminal/computer, printer and modem) cost $5,500 not including his time spent evaluating hardware options.

6. POST INSTALLATION EVALUATION

Mr. Burns is less than satisfied. He finds the equipment noisy, although it was supposed to operate quietly. The word processing software is defective and the operating system poorly documented. He has not yet tried data communications as he doesn't "trust it".

7. COMMENTS

This is an intriguing situation: the individual in this case decided to acquire his own information system at his own expense. Mr. Burns believes it has taken substantially more time than it should have to purchase the system and make it work even in a non-communicating mode. He is not a computer "hobbyist" and sees the value of his system in its ability to support his working needs. His conclusions are that retail computer stores still don't understand the needs of professionals; that professionals will pay more to get greater reliability, service and ease of use; and that simple ways for most people to work at home have not arrived yet.

Mr. Burns would add that a company has much better resources to assist those who can and want to work at home - including technical people to evaluate equipment and assist users at the outset. More companies should consider a program offering this kind of assistance to segments of their employees.

December 1982 - February 1983

Scott Burns is happy with his system at this time. He continues as Financial Editor and as a syndicated columnist on U.S. economic conditions. He has also become something of a computer hobbyist, due to his decision to work at home supported by a personal computer. Mr. Burns has only made one change to his configuration. He added a Daisywriter letter-quality printer, a very inexpensive unit (about $1,000) that has worked quite well for him.

Mr. Burns went through the usual problems new computer users have about the time of the original interview. These were primarily in the area of software which, unfortunately, is still not written for casual use. You have to devote a good deal of time (typically 1-3 weeks) learning he command structure and unique ways each program operates. This seems to be particularly true for word processing programs whose documentation is generally poorly written and organized.

Mr. Burns prints out his work for the Boston Herald but transmits copy to his syndicating organization in the Midwest as data, not facsimile, which they recieve on a teleprinter and cannot record in a computer system. This means they have to re-key the articles into their own text processing system.

The net result is that his articles get there faster (as opposed to the mails) but no real work is saved that might be if the syndicator could capture the work in their own computer and edit it for publication. Mr. Burns is chagrined about this (and the fact that his Boston paper can't even do this much, so he sends them his column in hard copy form) and thinks publishing companies are generally "primitive" in their use of technology.

Mr. Burns is "extraordinarily happy" being able to work at home and limit his time in the office to about one hour a week. He has now been "telecommuting" for 1 1/2 years and believes the economics of working at home will cause 10-20% of the U.S. work force to telecommute by 1990. This is an opinion based on extensive research Burns has done into the economic advantages of working at home. He offers some interesting concerns, as well, based on his personal experience:

> Mr. Burns has not found interruptions from his wife and family a major problem, but, conversely, he has found it necessary to discipline himself to stop working, as a combined home/work arrangement can be addictive and occupy most of his waking hours.
>
> While he values working at home, he definitely misses the stimulus of his co-workers and has tried various other social interchanges (such as a health club) to keep from getting "stale" by working alone. These have not been totally successful and he is still looking for ways to maintain contact in this working environment. Interestingly, Burns said he has not used computer conferencing or "bulletin board" systems such as The Source to be in touch with others electronically, but indicated he will try this approach.
>
> Mr. Burns misses the availability of support people to do tasks like basic research for the articles he writes. The Boston Herald has been recently sold and the new management is actively considering buying personal computers for other staff members, opening the possibility that these can be networked and, perhaps, provide the support capability Burns seeks.

This continues to be a most intriguing situation. Scott Burns is a respected financial columnist who is gaining a very clear understanding of the economic (and other) impacts of a key future technology by actually using it. Because he is a keen observer, he is able to make his perspective on the future use of technology in offices much more real by his personal use of systems and his appreciation of their realities as well as theoretical application. This comes out in a comment he made about a disturbing question he was asked when he recently made an infrequent trip to his office. A secretary said, "you used to work here, didn't you?" Burns thinks this is because people still look at work as a place you go, rather than something you do.

UNION CARBIDE

Recently having moved headquarters from New York to Danbury, Connecticut, Union Carbide produces carbon products, chemicals, plastics, gases and related products, and metals. They have 106,455 employees and annual sales of $10.7 billion.

Contacts: Wallace Sadauskas, Manager Printing,
Brian Cluer, Manager Prepress operations
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Phone: (203) 794-5657

February 1982

1. APPLICATION

In-house printing and literature distribution using a combination of communicating word processing and phototypsetting at the company's central printing facility, accessed by telecommunications.

2. SCOPE

After using a variety of typesetting equipment, Union Carbide has gone to Wang System 30 with an attached model 48 phototypesetter and communications capability. Divisions located all over the country are now transmitting directly to the central operation and producing finished copy. The System 30 acts as a communications and format controller, feeding transmitted copy directly to the phototypesetter. Input to the system comes from five regional word processing centers and two computer centers.

3. REASONS FOR APPLICATION

The goals were: to eliminate re-keying materials that are to be printed; reduce the overall costs of printing by doing more of that in-house; improve response time for regularly produced documents like price books; allow storage of standard technical information for inclusion in a variety of manuals and literature; and to create standard formats that could be stored and further reduce keying (of control/format characters).

4. TYPE OF ANALYSIS DONE

The focus was on a comparative evaluation of available equipment based on specifications developed from prior, unsatisfactory experience.

5. ESTIMATED COSTS

Not available, but Richard Dalton, Open Systems, estimates that they are substantially below the previous combined equipment/labor costs. Equipment looks as if it has cost about $150,000 at the central site.

6. POST INSTALLATION EVALUATIONS

Interestingly, teleconferencing is used as a means of holding "meetings" to exchange information and suggestions for improvement.

7. COMMENTS

Seems highly successful. "Rush" requirements have been exceeded. "They were asking for next day service, we gave them same day service", was one comment. Union Carbide expects to eventually replace their hardware with a mini-computer to combine more data and word processing activities such as an inventory of all literature and distribution channels.

July 1983

Union Carbide is still quite happy with their Wang communicating word processing system. As planned in February, 1981, they have replaced their hardware with a Wang VS-100 mini-computer and are satisfied with its ability to combine data storage and word processing. The big change since early 1981 is that they are now using Wang personal computers as word processors and plan eventually to replace all workstations with the pesonal computers. This equipment change accompanies a user change: managers now generate letters and reports on their own computers. Until June 1983, they had to hand these drafts physically to secretaries for polishing and keying into the word processing system, since there was no link-up. In response to this problem, in July 1983 the word processors and personal computers were linked using in-house programs.

Evaluations, including cost studies, were done but so far have not been made available.

For information on Union Carbide's excursion into teleconferencing, Brian Cluer referred to Jeanette Spade, Voice Field Services Consultant. Under her direction of a primarily research and development oriented program, voice teleconferencing facilities have expanded in 1982/1983 from 3 to 23

locations in the U.S. System-wide as well as point-to-point conferencing is available.

Use at present is either within a particular division or in the central conference rooms of the Scientific Systems & Operations Department (headed by Spade) in the Danbury, Connecticut headquarters. If a division wishes to install its own facility, Spade travels to the location, installs an American Bell Quorum unit (microphone and loudspeaker) and Gemini electronic blackboard. She arranges a business line with the local telephone company (not always Bell). Her next step is to train 2 or 3 coordinators per area to serve as resource people for actual users of the system. She believes that making local people responsible for the system helps combat user hesitancy. These people become, informally, a services division under Spade's direction, and she keeps them informed of potential uses and users of the system. She also trains users, who run almost the entire gamut of employees: managers, engineers and other technical people, sales staff - "anyone who travels".

Union Carbide's interest in teleconferencing is financial, since (as many other companies) they have been affected by the recession. While the system does not entirely eliminate travel, it does curtail it. Certain travel (to hire employees or discuss confidential matters, for example) is still necessary, and as Spade says, "some people like to travel and some people like to stay home".

In one example, Chemicals & Plastics Group with members all over the U.S., teleconferencing has replaced monthly meetings to discuss sales of their product. Length of the meetings has been reduced from 2-1/2 days to 1 or 1-1/2 days, and savings amount to $6,000-$7,000 per meeting. An additional benefit is that the teleconferencing format forces participants to adhere to a stricter schedule, resulting in more work in less time than before. The group still finds it necessary and desirable to meet face-to-face every six months.

Spade feels the use of a telefacsimile system (they use Panafax) is an important part of teleconferencing. In setting up a conference, she takes the nearest available fax to the conference room and lists its number as part of the conference to enable participants to communicate drawings, schematics, etc. Often a secretary will transcribe voice and electronic blackboard messages and transmit the resulting typescript via fax to participants for on-the-spot feedback.

To encourage use of the system, Spade issues frequent articles in the nation-wide employee newsletter. Responses give her leads to potential users. In addition she actively seeks expansion of the system at the division management level.

In the future, Union Carbide is interested in freeze-frame video, but research and development money earmarked for this purpose is unavailable at present. Full motion teleconferencing is not being considered, since the company's main interest in teleconferencing is saving money through curtailment of travel and lost time.

DAVIS POLK & WARDWELL

This enormous general practice law firm based in New York city employs 251 lawyers (64 partners, 179 associates, 8 counsel) in its New York offices, 16 in Washington D.C., 6 in Paris, and 3 in London. Clients include AT&T, Ciba-Geigy, Exxon, and Honeywell, to name just a few of the many large accounts. No income figures are available.

Contacts: Peter Langston, Director of Computer Services, Robert Hendel, General Manager (1982).
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Phone: (212) 530-4000

February 1981

1. APPLICATIONS

Legal support system providing word processing, electronic mail, information search and retrieval, telephone/address directory maintenance, client accounting and billing.

2. SCOPE

DP&W has 3 Digital Equipment PDP-11/70 computers, currently supporting more than 40 CRT terminals and 2 Xerox 9700 laser systems for printing legal briefs and other extended outputs. The software is from Interactive Systems and is based on the Unix Operating System (a particularly flexible system). Hardware was installed in June 1978 and actual operations began a year later.

3. REASONS FOR APPLICATION

Stand alone word processors were solving only a small part of DP&W information problems. They wanted a system that allowed the same data to be used in multiple ways (to prepare a legal brief, use later for researching other, similar cases, and to produce client accounting and billings). They also wanted an easily used system that would directly involve professionals instead of just clerical employees.

4. TYPE OF ANALYSIS DONE

A "core group" of partners and support staff was formed to evaluate the existing information uses and support systems. With help from outside consultants, they examined stand-alone and shared-resource word processors, networked small systems,

time sharing and medium to large scale computer systems. Factors considered included: system features, flexibility, ease of use, reliability and cost.

5. ESTIMATED COSTS

Equipment costs are approximately $1.5 million. A five person systems staff has been added at a cost of about $200,000/ year. Employee training costs are substantial (4 half day sessions each) but are viewed as a worthwhile investment.

6. POST INSTALLATION EVALUATIONS

The "core group" (see item 4) has been expanded to include systems personnel and meets bi-monthly to evaluate system performance and possible enhancements. They have not attempted to assign quantitative values to what management views as a general improvement in effective use of staff resources and service to their clients.

7. COMMENTS

Plans include expansion in the number of terminals in New York and extension of the system to Davis Polk,s European operations. This is a good example of innovative use of office automation to directly support the professional/-management employee level.

December 1982

Davis Polk has substantially expanded their support system and now have more than 250 terminals linked to six DEC PDP-11/70's. They have full telecommunications capabilities among two New York City and their Washington, DC, offices, but have put off linking their European offices for the present.

Some 30 lawyers now have their own terminals and use them to directly access legal information, draft briefs and utilize the professional time accounting system. Robert Hendel said two lawyers had even begun programming their own applications in the "C" language they use in their Unix Operating System. DP&W also employs about 25 professionals who work at home part time and communicate with the system via Texas Instruments Silent 700 terminals.

Interestingly, DP&W has made no attempt to cost justify this very significant investment in systems. Hendel states, however, "there is no doubt in our minds" that the costs are justified. In fact, their goal is to have a terminal for "100% of the staff."

Robert Hendel has explored the possibilities of adding voice store and forward and feels that voice mail systems are too expensive and too limited at this time. He also believes that data och voice communications should be handled through separate networks as data transmission requirements are too heavy to allow concurrent voice traffic without degrading one or the other. He has similar thoughts about video teleconferencing - it is much too expensive presently and cannot be justified, at least not for DP&W's needs.

DP&W are much more extensively involved in office automation than any US law firm encountered. They have made a large investment in training and now seem to be reaping the benefits. Lawyers are notorious for avoiding direct use of computer systems, yet they have been able to convince significant numbers of them to use their system as a normal part of their work.

The system DP&W uses was supplied by Interactive Systems. This vendor is curious - a very early advocate of Unix-based systems and a real pioneer in integrating multiple office systems functions, they have been unable to capitalize on this early lead and are not well known in the US.

Besöksrapport från Datadelegationens besök vid Davis, Polk and Wardwell den 22 februari 1983

Adress: 1, Chase Manhattan Plaza, New York, NY 10005
Tel. (212) 530 4000

Medverkande: Advokat Robert A. Hendel, director of operations

Rapportör: Peter Docherty

DAVIS, POLK & WARDWELLS VERKSAMHET

Davis, Polk & Wardwell är en advokatbyrå med omkring 600 anställda av vilka ett 70-tal är delägare (partners) och ytterligare 250 advokater (associates). Ungefär hälften av den senare gruppen är kvinnor. Det är ett av de 15 största advokatbyråer i USA med kontor i New York (2 st), Washington, Paris och London. Verksamheten är inriktad i första hand på civilrätt med affärsklienter. Firman är känd som en som "förstår" datateknik och man har fått många fall som rör

området. Satsningen på användandet av denna teknik i den egna verksamheten har emellertid inte syftat till att påverka företagets affärsidé eller profil.

UTVECKLINGEN OCH DATAFILOSOFI HOS DAVIS, POLK & WARDWELL

Davis, Polk & Wardwell har arbetat med datateknik under de senaste 25 åren. Man har lärt sig mycket av tidigare misstag, såväl tekniska som organisatoriska. Exempelvis har man nu en skrivcentral på 15 personer jämfört med tidigare 200. Man satsar nu för att ge användarna stort inflytande över systemen av såväl personalledningS- som av systemtekniska skäl. Man har aldrig behövt motivera satsningen på datatekniken utan har upplevt ledningens och personalens stöd till att ständigt gå vidare. Produktivitetsförbättringar har varit uppenbara, "time management" är mycket bättre och klienterna är mycket nöjda med den service de får som systemen erbjuder.

1980 fattades ett beslut i företaget att förnya sitt hyreskontrakt och stanna kvar i samma loklaler 15 år till. Man tog tillfället i akt att planera hela kontoret med hänsyn till det system som skulle utnyttjas.

En grundtanke i firmans masterplan för systemutvecklingen har varit att maskinvaran ändras kontinuerligt och att firmans system skall byggas runt programvaran som varenda anställd skall kunna utnyttja på kontoret och hemma. Man valde Bells Unix operativsystem som har fördelen att det är portabelt mellan mikro-, mini- och stordatorer. Några huvudpunkter i företagets datafilosofi:

1. Alla kontorsfunktioner skall integreras i ett system.

   Systemet omfattar ordbehandling, elektronisk post, informationssökning och återvinning, telefonnummer/adressregisterändringar, kunddebitering och fakturering samt olika databassystem.

2. Alla funktioner i firmans kontorsautomationssystem skall vara tillgängliga från varje bildskärmsterminal.

   Kontorsautomationssystemet omfattar f n:

   ordbehandling
   elektronisk post
   databehandling
   diverse databassystem

3. All information skall vara tillgänglig "on line".

   Det innebär att man har för tillfället ungefär 2,4 miljarder karaktärer, dvs över en miljon sidor text on line. Man prövar för tillfället video-skivor.

4. Systemet byggs upp med en kombination av flera mini- och mikrodatorer som har tillräcklig överkapacitet att garantera tillgänglighet och tillförlitlighet. Systemet får aldrig gå ner.

5. Arabetet skall decentraliseras och fördelas inom firman samtidigt som man bibehåller fördelarna av en centraliserad databas.

   Samtliga anställda skall beredas möjlighet att utnyttja systemet: alla skall få terminaler.

6. Utvecklingen av samtliga system baseras på Unix operativsystem för att garantera flexibilitet och portabilitet.

   Portabiliteten innebär att firman har kunnat skaffa sig utrustning från olika tillverkare nämligen DEC, Amdahl, Perkin Helmer & Onyx.

FUNKTIONER OCH UTRUSTNING

DPW har sex stycken DEC PDP 11/70-maskiner. Fyra stycken används "i produktion", en är en back-up-maskin och den sjätte används av systemavdelningen för utvecklingsprojekt. Varje maskin har en 9-track magnetic discdrive och det finns två stycken 300 megabyte discdrives för datalagring. (Som en illustration av stämningen i företaget är samtliga datorer och bandstationer döpta efter berömda domare i Högsta Domstolen).

Rapporterna framställs i första hand av två stycken Xerox 9700 laser kopieringsmaskiner, som framställer 120 sidor/minut. Man har också tre stycken IBM 6670 maskiner som presterar 6 sidor/minut. Ute på kontoret har man 70 st låghastighetsskrivare (45 tecken per sekund) som delas en/två sekreterare.

På kontoret har man över 250 bildskärmsterminaler av tio olika märken. Kommunikationer klaras av med en protokollöversättare (Rayholl Vadix).

Man utnyttjar olika databaser:

- Lexus och Westlaw som är kommersiella juridiska databaser,

- Source och Dow Jones News Service som är vanliga kommersiella databaser,

- klienternas databaser samt

- egna dokumentdatabaser.

Handlingar i olika fall läses automatiskt in i firmans databas med hjälp av en Kurzwell optisk karaktär-läsare (OCR) som lär sig olika typsnitt. Operatören behöver endast kontrollera maskinen under inläsning av den första sidan i en bunt papper.

Man utnyttjar en relationsdatabashanteringssystem (rapid file manipulation) med en databasmaskin, Britten Lee IVM 500.

Ordbehandlingssystemet omfattar de vanliga redigeringsmöjligheterna och en automatisk kontroll av typografiska fel genom ett stavningskontrollprogram med ett ordförråd på 16 000 ord. Systemet möjliggör att man kan "dela" skärmen så att upp till 10 dokument kan visas på skärmen samtidigt. Det möjliggör också att delar av dokument kan flyttas mellan varandra på skärmen.

Datasäkerhet för dokument ordnas på tre nivåer: (1) endast ägaren, (2) en av ägaren definierad grupp och (3) samtliga användare (får tillgång till dokumenten). Särskilt känsliga dokument kan krypteras av ägaren med hjälp av en personlig kod.

Olika administrativa system möjliggör debitering av arbetad tid, telefonsamtal, utnyttjande av databasmaskinen samt kopiering på resp handläggare och klient.

Systemet är i drift 24 timmar av dygnet, 7 dagar i veckan. Ordbehandlingscentralen med 15 arbetsplatser arbetar 3-skift.

I dag arbetar ungefär 25 revisorer, advokater och programmerare hemma med hemterminal. Man väntar sig att antalet hemarbetande medarbetare kommer att öka. De eventuella risker som är förknippade med hemarbete (och de svenska farhågorna är välbekanta) väger mindre än fördelarna att kunna behålla kompetenta erfarna medarbetare inom firman. Det kommer att vara en praxis att erbjuda kvinnliga advokater en hemterminal under sin barnledighet.

UTVECKLINGSORGANISATION

Den ursprungliga satsningen på datatekniken i firman gjordes av en partner som blev starkt intresserad av ADB. I dag finns det minst tre partners som skriver dataprogram.

En Computer Operations Committee bestående av sju delägare (partners) träffas två gånger i veckan. Gruppen utgör den högsta planeringen och beslutsorgan i datafrågor. Datoravdelningen (Computer Support Group) består av 14 personer av vilka 4 är programmerare, 5 är utbildare och 2-3 underhållsingenjörer. Företaget svarar för sitt eget underhåll av samtliga terminaler. Det finns en ordbehandlingsgrupp bestående av samtliga arbetsledare (40-45 personer) som träffas varannan vecka. Sammanträdena är ofta en möjlighet att presentera utbildnings- och informationsmaterial för gruppen.

Företagets största problem är att behålla och utveckla sin kapacitet att vidareutveckla och bygga ut systemen. Man planerar exempelvis att införskaffa ett stort antal mikrodatorer och vidareutveckla sitt lokala datanät.

KOMMENTARER

Besöket var mycket lyckat. Vi fick träffa ett "litet" företag som hade kommit långt när det gällde kontorsautomation. Det var ett verkligt och rätt så unikt exempel på ett integrerat kontorsautomationssystem som omfattade flera funktioner och där systemet var centralt till firmans verksamhet.

- Det var ett mycket bra exempel på "stödteknologiutveckling". De drivande krafterna på ADB-sidan hade en gedigen grundutbildning och erfarenhet i firmans primärverksamhet, dvs de var advokater.

- Det var intressant att ett litet företag snabbt kunde etablera sig som ledande i området och erbjöds möjligheter att pröva de allra senaste tekniska utvecklingarna såsom video-skivor, databashanteringsmaskiner.

- De allra flesta anställda ansågs stödja utvecklingen. Endast en av chefssekreterarna vägrade att använda en VDU (bildskärmsterminal).

- Det verkade vara en fin stämning i firman trots att vissa drag hos kontoret var något främmande för någon från Sverige. Personligen tänker jag i första hand på skrivcentralen.

- Det var ett bra exempel på en total lösning där hela kontoret hade utformats för att integrera datateknik i organisationen.

- Det var något av en överraskning att se några produkter som redan använts "länge" i den civila sektorn i USA och som man idag talar om "att utveckla" i Sverige. En protokoll-översättare, om jag har förstått det rätt, utgör kärnan i SAS kontrakt till Ericson Information Systems att utveckla en allterminal. Här fanns de redan.

INLAND STEEL

This Chicago company produces steel sheet and strip, plates, structurals, and bars. They employ 35,100, with sales of $3.75 billion.

Contact: Dennis Doughty, Assistant Superintendent, Systems Department
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February 1981

1. APPLICATION

Use of high-speed Xerox 9700 laser printers to produce documents in a two-sided, 8 1/2 inches x 11 inches form and to also print some documents in a 2-page per single sheet format.

2. SCOPE

Used for most data processing reports, many of which are now reduced in size and/or printed on plain paper as opposed to pre-printed forms as the laser printers can "overlay" forms and graphics on the printed output.

3. REASONS FOR APPLICATION

Reduce usage of paper (costs are increasing 10%/year and shortages occur frequently). Reduce operator time associated with impact printing. Reduce the number of special forms used for reports and other documents.

4. TYPE OF ANALYSIS DONE

The Data Processing Department performed an in-depth analysis of computer printing volumes and projected these volumes and the cost of paper into the future.

5. ESTIMATED COSTS

The two laser printers cost about $16,000 month. Part of a programmer's time (about half) is devoted to formatting tapes for the printers.

6. POST INSTALLATION EVALUATIONS

Inland is saving about $10,500/month on reduced paper consumption and printing costs associated with forms. Operator's productivity has improved but has not resulted in cost savings as more time is now spent on quality control and better report distribution service.

7. COMMENTS

Inland is looking at ways to use these printers in conjunction with word processing and electronic mail systems being considered. Since no one expects paper reports to be eliminated, the cost savings will accelerate as the price of paper increases. This survey does not give clear evidence of cost savings at this time but it shows how improved technology can be quickly utilized to make other than financial improvements. Open Systems expects the relative costs for laser printers to come down in the near future; if integrated with office automation systems, laser printers should offer some real potential for this area.

July 1983

Systems Department is still pleased with the speed and efficiency of the Xerox 9700 laser printers; costs are considerably lower than with the IBM printer used previously. 900 users are now able to create forms with this system.

The most striking improvement has been that individuals are now able to generate their own forms instead of waiting for them to be generated by programming people. This has shortened turnaround time considerably.

While there are no plans at present to integrate the printers with word processing or electronic mail systems, they are being used to print output from the large-scale IBM systems, operating under the so called TSO time-sharing program.

OPEN SYSTEMS AND KEEP/TRACK

Contacts: Tom Hardagon, President, Open Systems, 330 Elli St, San Francisco, California 94102, (415) 865-6006
Richard Dalton, President, Keep/Track, 21 Tamal Vista, Suite 137, Corte Madera, California 94925, (415) 927-1244

February 1981

1. APPLICATIONS

Electronic mail, information access and retrieval, computer-based conferencing, general accounting and subscription fullfillment for publishing operations.

2. SCOPE

All staff members of Open Systems - four full-time and three part-time people - use electronic mail, conferencing and information retrieval continuosly (6 different electronic mail services are in use). Equipment consists of a CRT, a printing terminal and a portable terminal. A Datapoint microcomputer system was added in July, 1980 to use for general business applications and to support an on-line information service which started in October, 1980.

3. REASONS FOR APPLICATION

To maintain close contact with a national network of information sources. To be able to operate with a minimum of clerical support. To evaluate various vendors' electronic mail and information services. To test assumptions about office automation. To reduce service bureau costs.

4. TYPE OF ANALYSIS DONE

A careful comparison was made of available equipment, focusing on ease of use by professional, non-clerical employees and on flexibility of software options (including communications). A spending limit was established that was equivalent to the current secretarial/clerical expense less any on-going clerical support that was required. New revenue opportunities available with this equipment were also included.

5. ESTIMATED COSTS

Equipment costs are $750/month. The total communications cost is approximately $600/month. Clerical support (part-time) is presently (1981) running $400/month.

6. POST INSTALLATION EVALUATION

Expenses are about 10% greater than anticipated, but the use of communications networks is 200% more than originally projected. In addition, an on-line information service has been initiated generating increased revenues and the multiple electronic mail systems enhance the quality of publications and assist with marketing consulting services. Service bureau costs have gone down 50%.

7. COMMENTS

Staff members now consider these systems essential to their work. Since the company's work is primarily in office automation, the systems allow direct experience in the technologies that make up its work. Staff members can now work at home if desired and can keep current while traveling. The company expects to add word processing shortly to support publishing operations.

November 1982 - February 1983

In September, 1981, the principals of Open Systems decided to split the company's operations with Richard Dalton forming a new consulting and research company (Keep/Track) and Tom Hardagon continuing with Open Systems. Both individuals are still involved in the writing and editing of Open Systems Managing Office Technology, the office automation newsletter they co-founded.

The two companies maintain daily contact via the EIES network (a computer-based conferencing system) and are expanding consulting work via electronic mail/conferencing networks. Open Systems has been working with the authors and marketing agents of the "Mist"-system, an advanced microcomputer-based communications system currently designed to run on Vector Graphic 3 hardware and utilizing a Vector Graphic system as a computer, text-editing and intelligent terminal mechanism. Open Systems has also been a part of new computer conferencing capability that has been added to The Source (a famous U.S. videotex system for terminal and micro computers asess) by PSI, Inc.

Keep/Track currently utilize EIES, The Source, Compuserve (the Source and Compuserve are videotex-like systems), Infomedia's "Jenny" system (for electronic mail) and the Infomedia Notepad conferencing system. On-line evaluation is being done of the Cross Communications "Matrix" system, the first computer conferencing software package generally available at a reasonable price. Matrix costs $35,000 and

runs on DEC PDP-11/70 or VAX equipment. Freedom Net, a new network, is used for telex communications to European, Japanese and a few US clients who only have telex communications. Freedom Net offers a choice of instant or store and forward telex communications and also has electronic mail.

It is clear that Keep/Track could not pursue the kind of geographically spread business it is in, nor could it maintain contacts in these many different areas without use of networked electronic mail and conferencing facilities. Even staff workers living close to the office use electronic mail constantly, very often working out of their homes. Communications costs are in excess of $1,000/month, quite high for an organization of 3 full-time and 4 part-time workers; yet everyone believes that the expense is justified, based on the improved productivity of the staff.

Keep/Track Corporation has installed a Televideo 8024 system for basic computing/text-editing requirements used for the video banking application and to play computer games - something Dalton does during writing and research. It is used primarily as a "video banking" terminal in conjunction with First Interstate Bank's pilot project to establish the feasibility of home banking and bill paying services. Keep/Track is the only corporate account on this system.

The video banking application is a videotex-based system provided by First Interstate Bank in Los Angeles. Users are able to pay bills to some 20 different organizations that are accessed by a two-digit code in the system. There is no charge, at present, for this service as it is an extended trial program for this new services. About 300 people use it, and all but two are located in Southern California. First Interstate will offer a number of services (information access, home shopping and even games) once the pilot project becomes a generally offered bank service.

First Interstate, as many large U.S. banks, is worried about competition from within the industry and outside, as well. For example, Sears, the largest U.S. retailer, is now offering a full spectrum of financial services, including stocks and bonds, investment counseling, banking and other services. First Interstate is looking to electronic communications as a way to improve their competitive position.

Keep Track also has two modems (300 baud) and two printers - a 100 character-per-second dot matrix type; and an Olivetti Praxis 35 that has been converted to a printer by adding a board and serves as both a portable typewriter and as a slow letter-quality printer.

Keep/Track staff include a junior associate researcher and an administrative assistant who work with Dalton, sharing the equipment. The research associate works out of his home 3-4 days a week and the employees use electronic mail to keep in touch. This works very well, greatly reducing the work interuptions that would occur if telephone were the only means of communication. The associate uses a "homebrewed" system (a microcomputer he has built from various components) for communications from his home.

Open System have tried voice mail (through a service offered by American Express) and don't like it as well, since they need to have hard copy often to refer back to. They also use Dow Jones News Service for research. Communications costs are high.

CROWN ZELLERBACH

This San Francisco-based company produces paper products - paper, wrapping, bags, tissue, newsprint, towels - as well as board, pulp, lumber, chemicals, and plastics. They employ 32,000 in locations all over the U.S. and in Puerto Rico. They show sales of $3.15 billion.

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February 1981

1. APPLICATIONS

Electronic message system.

2. SCOPE

CZ has 180 offices in the U.S. and Canada. At present, they exchange written communications over a teletype system based on an obsolete Control Data M1000 computer and Wiltek terminals. The system carries thousands of messages daily.

3. REASONS

The old network can no longer handle the volume of traffic being generated by CZ offices. Also, new equipment appears to offer cost savings. A study by the company showed the old network had to be replaced. At first, communicating Wang processors or IBM terminals in an SNA network were considered, but three years ago a request for proposals was put out, and Datapoint won, apparently based on its software. The system is just now being installed and should be fully in place by the end of 1981.

4. TYPE OF ANALYSIS DONE

No analysis has been performed yet, but both quantitative (cost savings) and qualitative (does it improve managerial efficency) comparison with the present system is expected.

July 1983

Earlier contact Sid Smith is no longer with Crown Zellerbach, but new contact Jim Smith was responsible for installation of the Datapoint EMS, the electronic messaging system which

replaced the earlier M1000-based teletype. The Datapoint EMS was installed in August of 1982 and links the company's many nationwide offices. ("Wherever there are trees, there is a CZ office".) Access to the TWX telex system provides international communication, including the link with their San Juan, Puerto Rico, office.

Smith describes the Datapoint system as a very large, extraordinarily cost-effective network which meets the 1981 needs of the company very nicely (in 1983!). It provides the same service at 1/3 to 1/5 the cost of using outside electronic mail services for their volumes. The difficulty is that both the available technology and Crown Zellerbach's needs have leaped ahead since early 1981.

The present system utilizes single-function machines which can be used for either keying, printing or communication. Printing and communicating occupy the system to the extent that keying can be done only before 8:00 AM and after 5:00 PM. There are 300 nodes; CZ would need thousands. So, according to Smith, the Datapoint system can no longer be called "office automation".

The company has been very well satisfied with cost savings and efficiency of the Datapoint units, and Smith does not regret having installed a system which is obsolete in terms of present needs. He says CZ could not go out and buy the knowledge gained through use and evaluation of the Datapoint over the past year. At present they are studying the market to find an electronic mail system which will meet present and future needs. A full-scale evaluation will involve a pilot project utilizing whichever system is selected after current research is completed.

U.S. AIR FORCE

Contacts: Bob Kent, Program Manager, Mary Farris, Public Affairs Officer, Lt Col W T Farrell, Deputy Director (1982)
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February 1981

1. APPLICATION

Office automation pilot project involving both professional and clerical employees.

2. SCOPE

Pilot now involves 200 people in a system supported by a Prime 550 computer. The computer has a 1.5 Megabyte main memory and 680 Megabyte of disk storage. The so called "Info" data base management system is used to control electronic mail, cost estimation and word processing input to the system. 25 Ontel intelligent terminals and 25 word processors (various manufacturers) are directly connected to the system. 52 additional word processors have dial-up access. The pilot is in the third year of a 3-year term.

3. REASONS FOR APPLICATION

To determine if automated support can improve productivity at this base, particularly among the professional workers; and if successful, to be used as a basic design for a system to support the majority of employees at the base (5,000 employees).

4. TYPES OF ANALYSIS DONE

A lengthy quantitative study was performed by the Booz, Allen and Hamilton Consulting Group to determine pre-automation costs of doing business. They developed cost factors for production of most "products", ranging from inter-office memos to requests for proposals, and then developed work flow documentation to help select useful pilot areas.

5. ESTIMATED COSTS

$1.6 million has been spent for equipment, consulting services and training. This estimate does not include Air Force personnel costs.

6. POST INSTALLATION EVALUATION

Hanscom people have completed an analysis of clerical tasks which shows that the capacity for clerical work has been doubled. Booz Allen's baseline study found that 50 percent of the total office time was professionals doing professional work, 25 percent was professionals doing clerical work, and 25 percent was clerks doing clerical work. This has been reduced to 12%. They believe this is clear evidence of the system's value and are gradually expanding its scope.

7. COMMENTS

The Air Force base employees are pleased with the tecnical environment, particularly the data base management system. However, because of this, they believe skilled technical people are essential to this type of approach.

Electronic mail has been disappointing; there are not enough people to send to. Employees expect this to change as the system expands. They are remaining sensitive to the issue of maintaining or trying to improve the quality as well as the volume of professional work, and so have adopted a case study approach including people who have completely redesigned the way they work as of the new system.

At present, 70% of the professional workers involved in the pilot use the system. Two groups are exceptional in their usage. New (generally young) employees literally demand access to the system and will bring in their own microcomputers if they can't get access right away. Employees in the 50+ age group have been generally resistant to the idea of using keyboards and are concerned about how this will affect their jobs and career aspirations.

Air Force people realized early in the pilot's implementation that acceptance of the system by users was a critical factor and hired American Institute of Research (a social psychology consulting group) to handle training. They formulated a training program that gives 24 hours of direct, careful training for each new professional user. This includes 8 hours of briefing on on-line functions, 8 hours on the software facilities and 8 hours on data base management facilities.

The latest addition to the system is extensive graphics capabilities for "telebriefings" that use large screen displays. Initial uses involving the command's headquarters have been quite successful. Graphics are displayable anywhere in the system, using the new interactive software package.

July - August 1982

The pilot was completed in October, 1981, and was deemed a success. It is now being implemented as a regular program at Hanscom.

The amount of clerical work done by clerical people at the command was reduced 60 percent, the amount of clerical work done by professional people was reduced by half, and the amount of professional work done by professional people was reduced by 30 percent - all by electronic mail and word processing.

Lt Col Kent questions whether doing more of the same thing is an increase of productivity, but notes that the system did, at least, have a measurable effect. He also noted that "these numbers hold up only when users actually use the system - something you must be sensitive to when installing one." The results of the study are in a several-volume set, available free from Lt Col Kent.

The project now has more than 300 users, but is constrained from further growth by the size of the Prime system. Eventually, the system will serve 4,000 of the 5,000 people on the base. There are two Digital Equipment Corp. VAX computers due during August, with a planned total of 8. A broadband cable local-area network, Mitrenet, is also being installed.

Graphics are handled by an HP3000 Series 44, with 15 plotters and a typesetter composer, which accepts input from anywhere in the network and prepares it for formal briefing papers.

The 300 users share 100 terminals; Hanscom has found a 3-1 ratio is sufficient. So there are now 100 new terminals in place of the 25 old Ontel terminals. Incompatability was not a problem because there were no advanced terminal features used - they were acting as simple ASCII terminals. The Ontel terminals have been replaced with Hazeltine and Televideo-terminals. There are also 150 word processors, up from 77, with an eventual goal of 200. More than one WP vendor has been used, but incompatability has not been a problem.

Electronic mail software was custom written for Hanscom, and has been rewritten three times to run faster and be easier to use.

Besöksrapport från datadelegationens besök vid Electronic Systems Division, Air Force Systems Command den 23 februari 1983

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General Phil Conley, Vice Commander Colonel Tom Duff, Chief of Staff

Rapportör: Christer Marking

OM HANSCOM-BASEN

Hanscom är en flygbas alldeles i närheten av Boston. Det för vårt vidkommande intressanta med basen är att man under några år arbetat med att utveckla ett kontorsinformationssystem. Det yttersta syftet med att ta fram sådana system är naturligtvis att förstärka flygbasens effektivitet både i fredstid och i krislägen. Man startade arbetet med ett kontorsautomationssystem i mitten av 1970-talet och man blev 1981 klara med en prototypanläggning. Från denna prototypanläggning har det varit möjligt att dra slutsatser för en mer omfattande automatisering av stabsarbetet på basen.

Den utsagda bakgrunden till utvecklingen av ett kontorsinformationssystem var att man väntade en kraftig ökning av arbetsbehovet på basen medan man samtidigt ansåg det vara omöjligt att öka antalet anställda. Det fanns således en stark förväntan om att kontorsautomation skulle ge positivt bidrag till stabsarbetets produktivitet. Den avdelning som har arbetat med att utveckla det här systemet har också som uppgift att försöka sälja likartade system till andra flygbaser. Avdelningen har således haft ett intresse av att kunna visa svart på vitt på effekterna av kontorsautomatisering, på både de professionellas (handläggarnas) arbete och kontorspersonalens arbete.

Det system som man presenterade för oss vid vårt besök var tämligen omfattande både geografiskt och räknat i antalet personer som använde systemet. Sett som ett kontorsinformationssystem kan man inte säga att det var så förfärligt märkvärdigt om man jämför det med vad flertalet leverantörer säger sig kunna offerera idag. Lika fullt kan man säga att systemet är intressant eftersom det är ett fungerande system,

installerat och använt av såväl handläggande som administrativ personal. Systemet är uppbyggt runt ett lokalt nätverk som är levererat av Mitre Corporation. Det är ett bredbandssystem. I arbetet med att utveckla systemet har konsultföretaget Booz Allen & Hamilton gjort mycket av utvecklingen av systemet. Företaget har även svarat för utvärderingen av prototypsystemet.

Projektet har gått under namnet IMPACT (Improved Administrative Capability Test). Projektets syfte har varit att

1. utvärdera det existerande kontorssystemet

2. välja några system för prototyptest och att skaffa in hårdvara

3. utforma en prototyp

4. implementera och testa prototypen och

5. dokumentera resultat och preparera implementeringen av huvudsystemet.

Som nämnts ovan var det viktigt att få en möjlighet att bedöma förändringar i stabsarbetet före och efter införandet av kontorsautomationssystemet. För att kunna göra en sådan jämförelse gjorde man en genomgång av de "produkter" som kan uppfattas som resultatet av stabsarabetet. Man gjorde en gruppering av dessa efter vikt och efter arbetsintensitet. De produkter som man på det sättet valt ut studerade man närmare med avseende på vilka arbetsuppgifter som ingick i dem samt gjorde uppskattningar av den arbetsmängd som nedlades i var och en av dessa arbetsuppgifter. Två och i vissa fall tre sådana studier gjordes före förändringen.

Man konstaterade att handläggarnas arbete var en samling av arbetsuppgifter som var likartade till sin karaktär och som återfanns i stort sett i alla produkter:

1. Planering

2. Konsultationer

3. Datainsamling

4. Analys, sortering och utvärdering av data

5. Utformning av manus

6. Omarbetning av manus

7. Koordinering med andra handläggare

8. Att skaffa godkännande på sin promemoria

9. Att sprida promemorian

10. Att upprätthålla arkivet.

De produkter som blev "kandidater för automatisering" var sådana som karaktäriserades av

* en hög grad av administrativ arbetskostnad

* en hög grad av handläggarinsats i rent administrativa funktioner

* en hög grad av handläggarinsats.

Avsikten var alltså att installera automation där denna kunde reducera de nämnda kostnaderna i en omfattning som var större än kostnaden för automationen.

Av de "produkter" man valde var föredragningar den tidsmässigt helt dominerande. Vid produktionen av föredragningar var procentandelen administrativ personals arbete 34%. Av de återstående 66% (handläggartid) utgjordes 45% av sådant arbete som normalt hänfördes till kategorin administrativ personals arbete.

Om man går igenom samtliga "produkter" så blir resultatet följande

50% utgörs av handläggartid (handläggare utför handläggaruppgifter, H/H nedan)

25% utgörs av administrativ personals tid (A/A nedan)

25% utgörs av administrativ personals uppgifter som utförs av handläggare (H/A nedan).

Projektets resultat med utgångspunkt från arbetskraftens utnyttjande:

I utgångsläget (manuellt system	Förväntat resultat av automation	Uppnått i prototyp-systemet
(H/H)	Ingen reduktion	30% reduktion
(H/A)	75% reduktion	50% reduktion
(A/A)	50% reduktion	60% reduktion

Prototypsystemet har lett till en arbetskraftsbesparing totalt motsvarande 24%. I en sammanfattning av utvärderingsstudiens resultat tar man upp följande punkter:

*Automatiseringen leder till signifikanta produktivitetsförbättringar i följande avseenden:

- Minskat behov av administrativ personal
- Minskad handläggartid på administrativt arbete
- Bättre utnyttjande av handläggartid

*Återbetalningstiden beräknas till mindre än två år.

*Signifikanta kvalitetsförbättringar i följande avseenden

- Förbättrad produktkvalitet
- Minskad omsättningshastighet i produktionen av produkterna
- Ökad tillförlitlighet i data
- Minskat behov av arkivering

*Förbättringarna kommer att fortsätta genom vidare utveckling av systemet

- Ordbehandling leder till de största vinsterna i första steget
- Informationsbehandling leder till de största vinsterna i andra steget
- Telekommunikationer kommer att bli det tredje steget

*Systemeffektiviteten är delvis en funktion av hur systemet används och underhålls

*Mänskliga faktorer kommer att påverka systemframgången

- Utbildningsbehovet är omfattande
- De administrativa arbetena måste omvärderas

*Framgång kräver att ledningen engagerar sig i projekten i flera avseenden

- Vid implementeringen
- Vid systemutvecklingen
- Vid utbildningen av folk
- I enskilda människor
- I stöd till nya och innovativa grepp.

Sammanfattningsvis hävdas att automationens inflytande på personalen i staben som helhet måste beaktas noga. Man menar att det minsta problemet har varit det tekniska, det allvarligaste problemet är det mänskliga problemet. Man begär av

folk att de skall använda nya metoder och nya procedurer. Organisationen måste förändras för att sådana metoder och procedurer skall komma till en vettig användning. Utbildning och kravet på skicklighet kommer att förändras. Alla dessa förändringar kommer att påverka och förändra existerande personalpolitik.

KOMMENTARER TILL BESÖKET

Det arbete som gjorts på basen var imponerande både i fråga om systemets omfattning och funktion och i fråga om det noggranna utvärderingsarbete som gjorts av hela projektet. De produktivitetssiffror som utvärderingen visar är unika både som resultat av produktivitetsbedömningar i samband med kontorsautomation. Detta förtjänar att kommenteras något.

Det finns få om ens några studier av produktivitet och kontorsautomatisering. De studier som rört ordbehandlingstekniken, dvs en del av kontorsinformationssystemen, har givit mycket varierande resultat. Flera sådana studier pekar på att den totala volymen av s k administrativt arbete inte minskar. På Hanscom-basen har man mycket detaljerat studerat vad man kallar för produkter. Som nämnts ovan innehåller dessa produkter arbetsuppgifter som är mätbara när det gäller arbetsinsatsen. Man har valt ut ett antal sådana produkter och funnit tekniska hjälpmedel för att utföra de arbetsuppgifter som ingår i produkten. I uppfattningen om arbetsflödet finns mycket klart föreställningen att produkterna är stabila över tiden, dvs samma typer av produkter kommer att framställas under en överskådlig tidsperiod. Det finns heller ingen anledning att vänta att nya produkter skall komma till. Man räknar således med en hög grad av stabilitet i produktionen.

Det är vid framställningen av dessa produkter som man har gjort för- och efterstudier. Förutsättningen för dessa studier har varit att de som arbetat med att ta fram de här produkterna faktiskt har utnyttjat det tekniska systemet helt ut som det har varit avsett vid designen av systemet. Det har inte tillåtits några alternativa arbetssätt än de som föreskrivits i systemet. Således, givet att all personal följer systemkonstruktörens intensioner med systemet har de aktuella produktivitetssiffrorna uppnåtts.

Electronic Systems Divison använder produktivitetssiffrorna i sitt försäljningsarbete mot andra baser inom Department of the Air Force. Man är därvid mycket mån om att peka på att produktivitet och kontorsautomatisering framför allt handlar om ett management-problem. Om inte ledningen kan förmå personalen att arbeta efter systemspecifikationerna så finns det inga som helst garantier för att man får produktivitets-

siffror av det redovisade slaget. Man ser det som en utbildnings- och disciplinfråga.

Det är troligen så att det militära systemet i många avseenden möjliggör såväl permanens i produktionen som den "disciplinering" som är nödvändig för att nå de aktuella produktivitetsresultaten. Man skall observera att man vid produktivitetsmätningen inte tillåter några nya produkter med utgångspunkt från vad systemet gör möjligt. Det torde vara naturligt i icke-militära kontorsmiljöer att ny teknik också möjliggör nya slags tjänster. En sådan utveckling inryms inte i före- och efterstudiens uppläggning.

Som nämnts ovan är briefings (föredragningar) en mycket tung del av det totala arbetet för handläggarna. Framtagningen av underlag för sådana briefings, t ex overheadbilder (stordia), är en tidskrävande verksamhet för handläggarna. Framtagningen av sådant briefingmaterial är också en av de produkter som man särstuderat på basen.

Man har tagit fram en utrustning som gör det möjligt att utifrån ett ombrytningsbord motsvarande de som används vid sättning av annonssidor mycket lätt få en overheadbildsdesign med godtycklig text, godtyckligt centrerad med godtyckliga bilder. En bild som på det sättet tas fram på en skärm trycks på ett enkelt kommando ut i en automatisk tryckpress. Man har på detta sätt möjlighet att mycket enkelt använda standardiserade mallar för overheadmaterial samt att använda tidigare bilder med marginella förändringar såväl som att skapa helt nya.

Trots att det blir ganska billigt att ta fram overheadmaterial på detta sätt så är volymen overheadbilder så stor att det blir en väsentlig kostnad totalt sett. Den utveckling man arbetar med nu är att hoppa över det led som overheadbilden utgör. Tanken är att bildmaterialet skall lagras elektroniskt och återskapas elektroniskt genom att projekteras på en duk under föredragningen.

Det system som man utvecklar nu ser ut ungefär på följande sätt. De bilder som en handläggare vill använda vid sin föredragning sänds via telenätet till de baser som skall vara med på föredragningen. När senare föredragningen äger rum kan denna ske på teleledningen. Om bilderna skulle översändas samtidigt som föredragningen, skulle man behöva mycket hög dataöverföringshastighet. Det behöver man inte nu och man kan därför använda teleledningarna.

På basen var man mycket måna om att berätta att vicechefen för basen hade en egen terminal på sitt skrivbord och också en hemma hos sig. Generalen kunde således gå in i systemet och skicka meddelanden till alla som arbetade med systemet.

På basen ansåg man att generalens engagemang i utvecklingen av kontorsinformationssystemet var betydelsefullt för hur systemet hade kommit att accepteras av den handläggande personalen. Generalen drev också viss typ av utveckling genom att ställa krav på olika typer av information.

BECHTEL POWER COMPANY

The Bechtel Group is a worldwide engineering company hedquartered in San Francisco. They speialize in power plants, pipelines, river and airport work, rapid transit systems, petroleum refineries, mining, and community and agricultural development. With 44,862 employees, their sales exceed $11 billion. Subsidiaries: Bechtel Power Corporation (San Francisco and branches), Bechtel Civil & Minerals, Inc. (San Francisco), Bechtel Operating Services corp. (San Francisco), Bechtel Petroleum, Inc. (Houston, Texas), and Bechtel International Corp. (San Francisco). Bechtel Group is one of the world's largest, privately-held corporations.

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February 1981

1. APPLICATIONS

Bechtel is experimenting with three office automation systems: a straight-forward electronic mail and message system, computer conferencing, and multi-function workstations. In all three cases, the equipment is leased, and the software and processing power is provided by outside vendors.

2. SCOPE

There are 77 users on the EMMS system Comet, 15 users on the computer conferencing system, and 4 multifunction workstations. Comet is an electronic mail system, designed for sending messages back and forth. Notepad is a computer conferencing system in which users "broadcast" messages to other members of a conference. All three projects are considered to be controlled pilot projects. The workstation project is located in the Information Services Department, but the others are spread throughout the company.

3. REASONS

A task force spent two years studying the flow of information within Bechtel, and discovered an excessive amount of paperwork being moved among its offices around the world. These three applications were selected because they were available from outside vendors, allowing Bechtel to experiment without a large investment and with the ability to get in and out of particular systems easily.

4. ANALYSIS

The Office Technology Group was formed in February, 1980, and began all three projects last summer. There have been two preliminary evaluations.

Project members are taking courses in conducting surveys and expect to do substantial quantitative and qualitative analysis of the project outcome in the next few years. "We see a need for both kinds of analyses", one staff member said.

5. ESTIMATED COSTS

The workstations from Axxa (Lexar Business Communications Inc) are about $10,000 each. Computer Corporation of America's Comet electronic mail system and Infomedia's Notepad electronic conferencing system are both charged by usage (departments pay their actual cost, while the Office Technology Group absorbs the cost of training, support and evaluation), and are finding an average cost, including equipment lease, of $100/month/person. The Group is suggesting users use CRTs to cut down on the flow of paper.

6. POST INSTALLATIONS EVALUATIONS

There are no post installation evaluations available yet.

7. COMMENTS

System utility is perhaps best summed up by a mining project manager, who told the project, "I was behind when I started using this thing, and now I am ahead. Not only that, I have never been better informed on a project's progress." He now takes a Texas Instruments Silent 700 with him everywhere he goes in the world.

July 1982

The four Axxa workstations have been removed. "They just didn't work out," according to Kathy Richards's assistant, Jane Jackson. Usage of the various systems has been deliberately decreased as Bechtel prepares to bring it in-house, off of service bureaus and onto its own IBM computers. Although the Comet and Notepad software provided by outsiders is in the running, they won't necessarily be the packages eventually selected; those evaluations are not completed. There are 20 users left on Comet and 8 on Notepad. The usage of both Comet and Notepad was deliberately reduced, in preparation for bringing the systems in-house.

The move in-house was dictated by rising service bureau costs and availability of capacity on in-house IBM computers. "We consider the experiments to have been successful," Jackson said. "Most users have been fairly happy." The firm has done both qualitative and quantitative measurements of the results, but has not yet chosen to publish them. (Bechtel employees remain unwilling to discuss these findings as late as in November 1983).

SECURITY PACIFIC NATIONAL BANK

Headquartered in Glendale, California, Security Pacific shows total deposits of $23.40 billion and employs 21,745 in its many offices and branches. Its holding company, Security Pacific corporation, shows gross operating earnings of $7.05 billion and employs 25,000.

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February 1981

1. APPLICATIONS

Security Pacific has been concentrating on organizing and improving word processing since 1980. At that time a study group was formed to look at the larger questions in office automation. As a result, 6 pilot project were organized for implementation in 1981. These are:

- Use of IBM 3730 Systems already installed
- Evaluation of telephone answering devices
- Development of a common file system for archival storage of all word processing and electronic mail output and to perform code converions between various types of equipment
- Flexible document storage and retrieval
- Computer-based conferencing (computer conferencing)
- Electronic mail

2. SCOPE

These projects are a massive undertaking all at one time. To maintain control, seperate task groups will be up to monitor each pilot and report back to the central office automation group. The size of each project will also be kept small initially to keep each one manageable.

3. REASONS FOR APPLICATIONS

Before this approach was selected, Security Pacific had decided to go directly to a highly detailed, strategic plan for office automation, complete with designing their own equipment if suitable units were not available form vendors.

This effort was scheduled to last for up to five years. With the hiring of people with more experience, management was convinced that a series of carefully developed pilot projects was the most effective and least risky way to proceed.

4. TYPES OF ANALYSIS DONE

After the group was formed they proceeded very pragmatically, making an inventory of the systems currently in place (including the Wang word processing equipment in centralized "typing pools" and the multiple IBM large-scale computers available in data processing) and projected the types of projects that could be effectively developed without a major expenditure or time-frame required.

5. ESTIMATED COSTS

These are modest considering the scope of these projects. The 3730 System (located in data processing) was already in place and has been expanded slightly to encompass professional employees. The telephone answering devices are inexpensive and have been given to 30 people to test their effectiveness. The common storage capability uses in-place IBM computers and disk storage devices, as will the document storage equipment and software. Computer conferencing is being tested with Infomedia's Planet system (a forerunner to Notepad), and electronic mail uses in-place computer and telecommunications facilities. Exact costs are not available but are believed to be well justified by the potential gains from these projects.

6. POST INSTALLATION EVALUATIONS

Although these projects are just getting underway, the study group plans to look at each pilot from the standpoint of cost-effectiveness of the individual project and also how it can be integrated with an expanding office automation program. They plan on developing ways to measure the impact on employee effectiveness and productivity.

7. COMMENTS

This approach has much to recommend it. The study group is not making any assumptions about which technologies will be most useful and intends on being as objective as possible in looking at results. They are also aware that many changes are underway in many of the pilot areas and that they have to take an evolutionary approach to building an overall office automation system. Further, the team members were very sensitive to the human factors, and are both sensitive to and willing to help resolve apprehension that results from new systems.

Future directions include tieing the word processing centers into the electronic mail project and using that as a base for document retrieval and archival storage. If there is a possible weakness in the approach used here, it may be in the strong reliance on the large-scale systems that may not be as supportive of telecommunications requirements or as cost-effective as other options.

August 1982

Security Pacific Bank has been hampered by the U.S. current economic downturn, the bank ordering a 10% budget reduction in all departments. This has reduced progress expected for all six major pilot projects originally reported, but they have been able to innovatively get approval for a voice mail system.

One of the original projects was the trial use of telephone answering machines. The bank felt there was clear evidence these devices enhanced worker productivity but did not think they, in themselves, were adequate. They started evaluating available voice mail systems and concluded that the VMX system (earlier called ECS) was superior to others on the market based on price per station, ease of use, and expandability.

Justifications of the system was less simple. Because of the budget constraints, actual cost savings needed to be projected. This was done by asking a sample of people in the bank's 600 branches and, especially, their international offices (located in 29 countries) to simulate the number of calls that would not be required if a voice store and forward system was available. This showed a 25% potential reduction in outgoing calls, which in itself is enough to cover the cost of the voice mail system.

Additional advantages were: a 13% reduction in the need to look up numbers to return calls (due to the recorded nature of messages); reduction in telephone receptionist transcription errors (a serious problem at the bank); and comments that you "knew" a person better because of voice messages rather than message slips, improving communication when the call was completed.

A VMX-16 voice mail system (1,000 user capacity) should be installed shortly to serve the initial group of participants through 1982. Current plans are to expand the system in 1984 and network both systems together.

The IBM 3730 Systems have been replaced with IBM 8100 Distributed Systems as the 8100's are more compatible with the mainframe systems installed at the bank. There is some dissatisfaction with these systems outside of the Data Processing Department as they are too technical. The bank wil begin using Displaywriters shortly.

The "common file system" is a vehicle to file all electronic documents in a common format, whether they are originally generated by the banks's Wang word procesing or IBM 8100 systems. This system now performs that function but budget limits have prevented its expansion to a free-form information retrieval system (based on IBM's "Stairs" software) at this time.

Computer-mediated conferencing has been experimented with, using Infomedia's Notepad system (which has replaced the Planet system at Infomedia), but the cost is too high to continue use on a service basis. Infomedia has announced a version of Notepad that could be purchased and run on a large-scale computer similar to the bank's, and the bank will consider buying this when it is available.

There are 140 pilot users of IBM's "Profs" (large mainframe software) for electronic mail. This has proved to be unpopular with non-technical users because it is difficult to understand - many data processing-type command structures that are "unfriendly." A revised version of "Profs" is expected soon and the bank will delay any expansion of this electronic mail system until they can evaluate it.

MANVILLE CORPORATION

This Denver-based company (formerly called Johns Manville) produces fiber glass and non-fiber glass insulation, pipes, roofing, asbestos. With assets of $3 billion and sales just under that figure, they employ 31,500.

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February 1981

1. APPLICATION

World-wide communications network that links word processing and other terminals for electronic mail transmission.

2. SCOPE

The network brings 8 AM Jacquard word/data processing computers with 41 terminals and 19 printers together with 85 remote terminals (including 35 teletypewriters) located in the U.S., Canada, France and Lebanon. Each node in the network is polled every 30 minutes for available messages which are then forwarded to the closest geographic location. Four Data General Nova 1200 minicomputers are used as communications controllers, as concentrations to interface the word processors and keep communications costs to a minimum.

3. REASONS FOR APPLICATION

After experimenting with "typing pools" and stand alone word processors, Manville staff wanted to adopt communications to link their various administrative and operating divisions. Also, better access to computer facilities and reduced labor costs for communications were desired.

4. TYPE OF ANALYSIS DONE

Manville made a thorough study of the relative costs to send messages in various ways. Fully allocated costs for the chosen communications network were determined to be $1.34 per average (1200 character) message. This was from $.25 to $2.48 less than alternative methods, ranging from telex to facsimile transmission. Also, this was the fastest method.

5. ESTIMATED COSTS

No cost figures are available. The per message savings are believed to justify costs of on-going expansion to the electronic mail system.

6. POST INSTALLATION EVALUATIONS

The amount of correspondence has doubled with no increase in personnel. Part time and temporary help has been elimated. Because shared-logic systems were used, the cost per work-station has dropped from the previous $900 to $300 a month.

7. COMMENTS

The AM Jacquard systems have extensive data as well as word processing capabilities. Users, as they become familiar with the system, are expanding beyond the electronic mail activities into areas such as the calculation and printing of price changes.

Many companies have difficulty determining the best ratio of workstations to printers in this type of system. After some experimentation, J-M believes that 4 workstations to each printer gives the best cost/performance compromise.

July 1983

Since 1981 Jacquard, which supplied Manville's office automation systems, went bankrupt and was acquired by a privately held California company, Applied Technology Ventures. As a result of these changes, research and development efforts have virtually stopped and Jacquard (now a division of Applied Technology Ventures) is not in a position to meet Manville's need for a multi-purpose, integrated system. An extensive evaluation of the market and of Manville's projected needs resulted in their selecting Wang. (As one might imagine, vendor stability was a major criterion in this selection.)

Currently, Manville is in the process of "migrating" the Jacquard system to Wang Mailway, through an in-house protocol and line-switch conversion from the Jacquard message-switching computer. Eventually Mailway will replace the Jacquard message switch. A bright side to the forced conversion is that document indexing and retrieval will now be possible as part of the integrated system. Manville will be acquiring a TIS database management system as part of this direction.

Data processing is currently done on a variety of minicomputers. As vendor contracts expire, Wang minicomputers will replace this equipment. Since office automation efforts will be directed toward creating a two-vendor environment (the IBM mainframe computer will remain, and more Wang equipment will be installed), no evaluations of the new systems are planned. After suffering through a two to three year conversion process, Bittner doesn't plan to ask any questions. He did stress that Manville was not unhappy with the Jacquard experience, since the system did what they wanted it to do at the time.

FIDELITY GROUP

Located in Boston, Fidelity serves as an investment adviser to investment companies, for which it earns $2 billion annually. Its subsidiary, Fidelity Distribution Corporation, acts as a mutual funds distributor and employs 150, with annual sales in excess of $50 million.

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February 1981

1. APPLICATION

Automatic voice recognition/response for routine information inquiries from customers (regarding fund price and yield).

2. SCOPE

Fidelity receives an average of 3-4,000 requests for this type of information daily. A Verbex voice recognition/-response system linked to 8 nationwide WATS (Wide Area Telephone Service, discounted long distance) lines and 3 Massachusetts telephone lines "asks" customers for the fund numbers they want information about, "listens" to the numbers customers pronounce, and then generates price/yield information for up to five requested funds. Service is provided 24 hours a day, 7 days a week. During the day (0800-1800 hours) the caller can be automatically transferred to a representative for more detailed data. The system can recognize male or female voices, can handle regional accents and can distinguish the numbers 0-9 and the words "yes" and "no".

3. REASONS FOR APPLICATION

To manage an increasing load of phone calls by using automated response for routine inquiries. To test voice recognition in a simple application so experience can be gained for later and more complex uses.

4. TYPES OF ANALYSIS DONE

Various response systems were reviewed that required "touch tone" input. Since more than 50% of U.S. telephones have rotary dials, a voice input system was selected as it would be universally usable without any additional equipment for the customers.

5. ESTIMATED COSTS

No cost figures are available. The Verbex system itself costs about $50,000 plus costs for WATS lines and PBX expansion. These latter costs would have been required with or without use of voice input.

6. POST INSTALLATION EVALUATIONS

Fidelity uses a ROLM automatic call distributor to control its telecommunications. This system produces extensive management information on an on-going basis. An example of a typical day: 4,200 calls were received by the voice recognition system. Only 345 of these were later transferred to be handled by a representative for detailed questions. Average time to answer a call was 2 seconds. 327 calls were delayed for an average fo 29 seconds. 147 callers hung up. The average length of the call was 53 seconds compared to the 123 second average for representative-answered calls. These excellent performance figures give sound information to base decisions on about increasing capacity when response falls below a desired level.

7. COMMENTS

Fidelity estimates they are saving $500,000 a year with this system. Yet they maintain that cost savings are not the major benefit. They believe improved customer service and marketing opportunities present greater advantages in the long run. Future uses for voice input include acount balance information and integration with electronic funds transfer plans.

July 1983

During the 1983 follow-up interview, one Fidelity manager kept asking plaintively, "Do you know anyone who might like to buy our Verbex?"

The difficulty seems to be not so much with the Verbex (for which Fidelity had such high hopes at the time of the original report) but with voice recognition systems in general. The director, McElroy, believes voice recognition is more than a few years away. Use has gone down drastically, simply because the system doesn't work. Presently one trunk is still used; when the system defaults, the call goes to a "live" agent.

One positive outcome of the experiment was a great deal of publicity. As an advertising gimmick, voice recognition has been successful. Fidelity is now convinced that the real future is with a touch-tone entry system, which McElroy feels will be the best way to provide integration with electronic funds transfer. He will be looking into voice mail systems and mentioned VMX and ROLM as possibilities.

J. WALTER THOMPSON

This major New York city advertising compay, with 7,000 employees and billings of $2.14 billion, is a subsidiary of JWT Group, Inc., which employs 8,000 and shows an income of $407.52 million.

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February 1982

1. APPLICATION

Access to multiple data bases providing statistical and bibliographic information. Internal automated library of all radio, television and printed advertisement copy. Data base of performance figures (sales, costs, profit/loss, etc) for each branch operation, usable in conjunction with modeling and planning programs.

2. SCOPE

JWT uses more than 200 data bases for research but most of the 20 to 30 daily requests for information are searched via SDC Search, Lockheed information services and the New York Times information service (the last of these is used about 15-18 hours a month).

The library has an on-line index to all currently used copy for its clients and their competitors and all JWT ad campaigns for the prior three years. The index uses multiple keywords that support search of videotape and microfilm advertising records.

The performance figures allow detailed analysis of each of JWT's 67 world-wide offices.

3. REASONS FOR APPLICATIONS

Need for faster, more complete information research; for better management information and control in their de-centralised operations; and to use technology as a marketing tool by "showing clients we are innovative".

4. TYPE OF ANALYSIS DONE

These related applications grew out of the original financial data base project. No formal cost/benefit study was performed: it was just viewed as necessary or advantageous by management.

5. ESTIMATED COSTS

Cost information is considered sensitive by JWT. Typical costs for information service access are $60-100/hour. JWT estimates they have used more than 600 hours since the program started.

6. POST INSTALLATION EVALUATIONS

JWT feels there is a real problem because each information service has a unique set of access codes and conventions. This creates the need for an intermediate staff of "information specialists" (many are research librarians) who interpret management's information requests and format them for search requirements. A program is under to way to train managers in information service access techniques so more requests can be made by the person needing the information directly.

JWT has created an impressive "war room" used to present information to clients with videotape, graphics, charts, and other media using the information obtained through searches. Management considers this a key advantage in the highly competitive and creative advertising business.

7. COMMENTS

JWT has formed a joint venture, based on their extensive use of services, with the New York Times information service to create and maintain a data base covering activities in the advertising industry. They have developed a simple means of accessing this data base so managers and professionals in the field will be able to use it without assistance.

Soon after their financial control system was operational, they were able to save a "substantial" amount of money because they were monitoring foreign monetary exhange rates and were able to react quickly to the unexpected devaluation of the Australian dollar by limiting their liabilities in that country.

July - August 1982

Although many of the same functions described continue to be offered at J. Walter Thompson, they are no longer centralized in a single facility known as the Financial Data Center, according to Ms Gegelys, who said the Center has been disbanded, with its functions going to both her department and the Financial Department.

There is no longer any effort to have non-Information Center employees access databanks directly. All requests are passed through the Information Center staff of eight. They decide whether to use paper or electronic means to find information. "We know when to use on-line services and when not to," Mary Gegelys said. "Sometimes, an electronic search can cost more and take longer." There are still more than 200 databases accessible through the information center, with new ones added every day. The problem of diverse interfaces to different databases has been improving, according to Ms Gegelys, who said the on-line services are offering simpler approaches, including more free text search and less keyword search.

The financial data center was disbanded because it was felt its functions could better be handled in separate departments. The "war room" has also been disbanded.

The applications were the victims of a recession which has battered the advertising industry, killing projects which were not considered central to the mission of the agency, and of corporate reorganization. American advertising agencies are frequently "shaken up." Sometimes this results from lost clients or personality conflicts. Sometimes people are fired when the people that hired them are fired. Sometimes people are fired for no discernable reason. It is equally possible the projects were killed because their originator was let go, regardless of their success or failure in terms of their original goals.

CONTINENTAL ILLINOIS BANK AND TRUST COMPANY

A bank holding company and subsidiary of Continental Illinois National Bank & Trust Company of Chicago, Continental Illinois Corporation reports gross operating earnings of $6.29 billion and employs 13,358.

Contacts: Timothy Turnpaugh, Vice President, Systems Research,
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February 1981

1. APPLICATIONS

Pilot project to test the impact of telephone answering devices on excessive telephone usage. Implementation of an information access and electronic mail system.

2. SCOPE

The telephone answering project involves 150 bank managers. The information/electronic mail system uses the bank's large-scale computers and existing communications facilities, linking 2,000 employees in both the Chicago headquarters and the bank's European offices through video terminals.

3. REASONS FOR APPLICATIONS

To reduce wasted time caused by "telephone tag" (incomplete calls back and forth) among management people. To provide better access to internal information and improve communications via electronic mail.

4. TYPE OF ANALYSIS DONE

Continental Bank has taken an "experimental" approach. They did not do any quantitative studies, preferring to adopt applications that has the potential of helping with recognized problems. They have a rule of using only proven technology that is already in use in these experiments.

5. ESTIMATED COSTS

No cost figures are available because of corporate restrictions on publishing this information.

6. POST INSTALLATION EVALUATIONS

Evaluations have been qualitative and very positive. The electronic mail and information system is widely accepted, particularly in the European operations. Acceptance of the telephone answering devices was slower but managers now believe they offer substantial savings of time. One brief study performed in the check clearing department showed that use of the information system allowed questions about missing checks to answered immediately, using on-line information, instead of the 45 minute average it used to take to research these questions before.

7. COMMENTS

Continental Illinois plans to continue evolving these and new applications. They are exploring use of the information system to support word processing from employees' homes in suburban communities; the feasibility of AT&T's "picture-phone" as a videoconferencing technique to reduce travel; and expansion of the electronic mail system to provide computer-based conferencing.

July-August 1982

The telephone answering device experiment has been extended to 250 officers, from 150 in February 1981. Continental Illinois continues to find that telephone answering machines are less expensive than voice mail systems. An enormous reduction in "telephone tags" has been accomplished through a combination of these machines and training in the bank which teaches people to leave "complete" messages that can be acted on.

The electronic mail system now has 5,000 users. The bank has 13,000 employees, of whom only 8,000 are ever expected to need electronic mail, so Continental Illinois has nearly reached its entire target audience. Of the bank's employees, 5,000 of them are tellers and clerks who are not expected to want or need electronic mail.

At present, there are 3,000 terminals for 5,000 users. The bank's goal is one terminal per user, but each department decides its own expenditure level, and some have not yet seen the need for unshared terminals. Continental Illinois wrote its own electronic mail software package, under the IBM CICS operating system. It handles 125,000 documents each month.

There are now 6,000 users, both bank employees and customers, on a data retrieval system known as IRIS (based on IBM's Stairs), which consists of 600 data bases comprising 25 billion characters of storage. More than 750,000 queries are made each month. Both IRIS and the electronic mail system are accessed via dumb terminals.

There still have been no formal studies of the results, and none are planned, but subjectively, participants believe there has been a reduction in paper and in excessive telephone usage.

Several new services have been added: CARL is a report writing system which allows next-day extraction of reports from large databases, using a language said to take only one hour to learn. Electronic mail allows users to update application databases. Computer-generated mail allows application programs to examine databases and compose electronic mail memos to users based on that information. Personal computing option gives a dumb terminal the capabilities of a personal computer, including electronic spreadsheet and statistical packages. (There are no personal computers at Continental Illinois.)

AMERICAN CAN COMPANY

This is a $5 billion (annual sales) company which specializes in the manufacture, distribution, and sale of container and package products as well as resource recovery of tin and steel from tinplate scrap. Headquartered in Greenwich, Connecticut, American Can Company employs 55,000 people in locations all over the world.

Contact: George Bazinet, Manager, Office Systems
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Phone: (203) 552-3113

February 1981

1. APPLICATION

Communicating word processors (WP) with electronic mail.

2. SCOPE

All employees in a 114-person line department at headquarters will participate. Similar WP projects have been in place since American Can was the subject of a major IBM office automation study in 1976.

3. REASONS FOR APPLICATION

The Business systems Manager, David L. Shay, was allowed several years to observe the flow of information between and among workers in several departments. His conclusion was that truly useful office automation should be structured to improve effectiveness, not efficency, and that the best way to do this was to increase secretarial productivity so they would have more time to support their managers. Every secretary will get a work station, with the freed up time expected to be used for clerical tasks now being performed by professionals. Primary time reductions are expected in filing and copying, not in typing (copying costs are expected to go down because the word processors will communicate).

4. TYPES OF ANALYSIS DONE

Shay was reluctant to discuss his analyses, but he noted that in one 2000-person building where simpler systems are already installed, 40 percent of all professionals are now supported by secretaries with WP equipment. He said extensive quantitative analysis has been done in an effort to predict benefits, and that actual results will be compared to predictions on a quantitative basis.

5. ESTIMATED COSTS

Shay declined to estimate costs, or the vendor of the equipment being used in the new system, but would say the equipment was ordered in February 1981, and was expected to be installed during the summer of 1981.

6. POST INSTALLATION EVALUATIONS

Not applicable.

7. COMMENTS

Shay was enthusiastic about the project but reluctant to discuss it. This effort is worth following as it may offer one of the few chances to make a realistic, quantitative before-and-after evaluation of office automation effects.

July 1983

American Can Company's data processing area has undergone considerable reorganization. Former contact David Shay was fired and for all anyone there knows, he took any electronic mail project plans with him. No one knows anything about a line department experiment or has any idea which department might have been involved.

There are tentative plans to install and test an IBM Dissoss System in 1984, with the intent of building an electronic mail system around IBM architecture ("display contact" and "display interchange" architecture, a high-level programmer's tool for implementing communications). Office Systems Manager George Bazinet is also considering an electronic mail system using the standard features of the IBM 5520; the ACC Greenwich, Connecticut, headquarters has a 5520 and the purchase of two more is planned before the end of the year. A subsidiary company has five at this time. These computers provide sophisticated peer-to-peer communicating ability and will be used to link those locations which have them.

DURAMETALLIC CORPORATION

Located in Kalamazoo, Michigan, this company produces rotary mechanical seals, flex metallic packing, oil pressure systems, tools, and related parts. They employ 556 and show sales of $34 million.

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February 1981

1. APPLICATION

Use of microcomputer systems for cost accounting and graphic reports.

2. SCOPE

Durametallic has $400,000 worth of IBM System 3 computing and data entry equipment. The treasurer was unable to do branch level cost accounting on the IBM equipment and so purchased two Apple II microcomputers and the "Visicalc" financial software package plus standard Apple accounting programs which he had modified by his computer retailer.

3. REASONS FOR APPLICATION

There was the inability to get accounting programmed for more than a year on the IBM systems. Durametallic wanted to eliminate part-time work required to produce the financial reports on a manual basis. The company also wanted continual on-line access to financial information.

4. TYPE OF ANALYSIS DONE

No lengthy analysis was performed. After determining that the equipment costs would be small, the Treasurer, Clark D. Hurlburt, went ahead with an Apple system based on recommendations from other financial executives he knew.

5. ESTIMATED COSTS

Equipment costs were just under $6,000. The Visicalc software package cost $150. Software modifications cost $1,500.

6. POST INSTALLATION EVALUATIONS

The comptrollers office now produces timely, accurate financial reports and can answer specific questions about cost accounting at any time. They expect the Apple computers to pay for themselves "in a year".

7. COMMENTS

This is a very typical example of the dozens of executives who have decided to use microcomputers to fulfill their information needs. In fact, Hurlburt, the company Treasurer, had his first Visicalc reports available the day after he started using the program, without any previous data processing experience. His only negative comments were that the diskette storage available on the Apple II is limited and that he would like to be able to integrate the microcomputers with the IBM systems but cannot at this time due to software incompatibility.

July 1983

Durametallic now has two Apple computers. One in the Accounting Department was originally purchased to do computations of foreign currency conversion (in dealings with subsidiary companies) using a Visicalc Program, which it continues to do. A second Apple was purchased to accompany the first one in computerizing the General Ledger System. As an interim solution, this worked well, producing expense reports for 168 departments, but the Apples proved too limited for this use. The General Ledger was transferred to an IBM minicomputer using a General Ledger System developed by Software International. (At the time of the first report, Durametallic had not been able to find appropriate software for the IBM.)

At present the Apple in Accounting is used for income taxes, some payroll computations, and financial analysis. The second Apple was turned over to the Engineering Department, where it is in constant use.

Over the next five years, Durametallic plans to install IBM Model 34 microcomputers for information linkage with its 16 domestic branches. The microcomputers will be used for perpetual inventory record maintenance, order entry, payroll processing, and some engineering information transfer.

TELDOK

On request, more information on TELDOK activities will happily be supplied by members of the TELDOK Editorial Board:

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Publications in English by TELDOK

TELDOK Report 6. The automated office. A description and some human factors design considerations. (With a summary and articles in Swedish.) November 1983.

TELDOK Report 11. New telecommunications technology – New organization? June 1984. (Also published in Swedish.)

TELDOK Reference Document B. Office automation in Europe. February 1983.

TELDOK Reference Document C. Office automation in Japan. February 1983.

TELDOK Reference Document D. Office automation and related technologies in Japan. February 1985.

TELDOK Reference Document E. Office automation in the US (partly in Swedish). February 1985.

Initiated by the Board of the Swedish Telecommunications Administration, the aims of TELDOK include:

- documenting, as early as possible, working applications of telecommunications systems, particularly for office use;
- publishing and distributing – when needed, also translating to Swedish – information on the use of telecommunications systems (particularly for office use), which might otherwise be difficult to obtain; and supplementing the information so as to increase its value to a Swedish audience and in a Swedish environment;
- study travel and conferences related to the documenting and distributing of information on working applications of telecommunicatons systems, particularly for office use.

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