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RECENT TRENDS IN COMPUTER TECHNOLOGY

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1. What is the "new" hardware?

2. What opportunities are offered by the "new" hardware?

   A. Administrative/service-oriented possibilities

      1) Totality of information storage
      2) Paperless administration/elimination of hard copy records
      3) Effect on user
      4) Different/flexible structure of information
      5) On-line processing concurrent with data processing

   B. Product-oriented possibilities

      1) Universal life
      2) Flexible premium annuities
      3) Adjustable life
      4) Retired lives reserve
      5) Bank annuities
      6) Variable life/annuities

MR. WILLIAM L. FERRIS: Developments in computer technology over the past decade have been very impressive. Advancements have been made in computer hardware and software technology as well as in other related areas. The following are a few examples of these advancements:

1. Hardware advancements:

   A. Dramatic increases in the power of processors (many fold) and mass storage capacities;
   B. Proliferation of the chip technology bringing us "mini" and "micro" processors and everything from $10 hand-held calculators to inboard computers in our automobiles;
   C. Laser technology and its application to non-impact printing;
   D. In all cases, significant reductions in unit costs.

2. Software and other advancements:

   A. A sizable extension of software technology including time-sharing enhancements, data base management systems, "end-user" languages, communications software, etc.;
   B. Greater diversity in the use of computers to perform administrative, technical and decision-related tasks in large corporations;

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C. An extension of computer use to smaller scale businesses;
D. Much greater sophistication regarding computers among non-EDP personnel.

These examples simply gloss over the surface of our recent past, and are intended to stimulate thought. The future promises a continuation, even acceleration, of this rate of advancement. For example, consider the following areas:

1. Personal Computing
2. Satellite Communications
3. EFTS (Electronic Funds Transfer Systems)
4. Office Systems
5. Distributed Processing
6. Electronic Mail

Considerable advancement in each of these areas is expected during the next five years.

MR. JOSEPH IZZO: Current trends in computers can be outlined as follows:

1. Trends in Computer Technology

   A. Increasing numbers of computers and applications
   B. User friendly languages
   C. Office automation

2. Declining Cost of Computers

   A. IBM 360/65 (1968)

      i. Large complex special environment
      ii. 600,000 instructions/second
      iii. $4 million original purchase (1968 dollars)

   B. IBM 4341-II (1980)

      i. Office environment conditioning:
         10% as much weight
         10% as much space
         20% as much power
         20% as much heat
      ii. 1,400,000 instructions/second
      iii. $320,000 original purchase (1980 dollars)

3. Impact of declining cost of computers to business is increased demand due to affordability.

4. Explosive growth of computer capacity and number of computers.

5. Trends in computer deployment

   A. Centralized vs. decentralized
   B. Distributed data processing
   C. Small independent stand-alone computers
   D. Centralized information banks.

6. Trends in development cost

   A. Computer technology - 2 1/2 times reduction every 4 years.
   B. Technologist costs - 2 times increase every 4 years.

7. Hub of the future office system

   A. Electronic mail
   B. Message switching
   C. Word processing
   D. User friendly languages
   E. Graphics
   F. Business time sharing
   G. Traditional data processing

What do these trends mean to the business executive and to the processing executive? First, to the business executive the concept of computers must become embedded into the corporation's strategic plan because of its impact on their growth and profitability.

Secondly, the organization and management of the data processing function must change. Executive EDP committees must be formed to coordinate technological advances with the company's overall objectives. A five or ten year strategic plan should be established. Data processing must become responsive to the needs of their company and see themselves, not as technologists, but rather as a resource to achieve overall company profits. The DP director must be made a part of the company's executive counsel.

MR. THEODORE E. BAIEDES: My presentation will be in two parts. First, I will describe a few recent trends in technology and certain programs which are underway at Travelers Insurance which employ or actualize these trends. In the second part I will share with you an audio visual presentation which was given by Mr. Joseph T. Brophy, Senior Vice President in charge of Data Processing at the Travelers, to senior management on the same subject.

The Travelers is a multi-line company organized into four distinct profit centers - Commercial Casualty Property, Personal Casualty Property, Group and Life Health & Financial Services. These profit centers are supported by corporate services such as investment, personnel administration, and data processing.

Our data processing dimensions are large. They include 2,000 people, a data center in Hartford with seven of IBM's largest computers, endless rows of data storage devices, countless tapes, and enumerable printers. In addition, we are currently developing an alternate data center in Atlanta, Georgia which will be operational in 1982 to share the data center workload with Hartford.

A more descriptive dimension of the impact of computers at Travelers is our network. Our communications network embraces 800 distributed processors supporting 8,000 terminals in 256 geographic locations. These distributed processors and terminals are all controlled and managed through the data center in Hartford. There are no programmers or computer operators in these distributed locations. All program development and maintenance is done centrally in Hartford and transmitted through the network. This is the first significant trend: Computerized work processes will move to geographically distributed nodes leaving the main computers in the data center to manage the network and the data.

During the 1970's there was much work done in the application areas of insurance, many of which depended on the use of terminals. Claim systems and policy issue systems were two areas which made use of terminals for interactive data entry. Many of the systems developed in the 70's were limited, however, in that the terminals could communicate with only one computer. Very often the communication monitor was unable to assist a terminal in dealing with more than one application. These constraints are vanishing. This is the second significant trend: Terminals will be able to serve as a universal work station and provide a variety of services to the worker.

Insurance companies after many years and many billions of dollars have been automating the work that underlies the insurance business. They have developed many transaction oriented systems such as policy issue and billing which are critical to the day-to-day operation of the insurance business. Recognition of the critical nature of the support required from a data processing department and the computers has lead companies to geographically disburse their computer sites to avoid or minimize the impact of natural and unnatural disasters. This is the third significant trend: Multiple data centers will be developed to provide backup in case of disaster.

The Travelers has worked diligently over the last two years in the development of a data strategy and a data management approach. The essential element of this data strategy and data management approach is the use of a data dictionary and directory which would establish data as a useable corporate asset. This would eliminate the boundaries that our data currently have as being application restrictive and make that data accessible to whoever in the corporation needs it for his own decision system or information requirements. This leads to a fourth trend: Data will become more accessible and will be available to all users through their terminals.

These are two very basic ingredients in the development of decision support systems. They are easy access to data and easy-to-learn easy-to-use tools such as high level languages. With the access of this data and the use of these tools, systems will be developed by end users and not by programmers. Therefore, users can service their unique needs, and as those needs change, so will the system be changed by the end users for their own purposes.

To review, the first trend that we are trying to exploit is that work will move to distributed processing nodes for greater efficiency using a network and leaving the large main computers to manage the network and the data. Secondly, the terminals of the network will serve as a universal workstation and provide a variety of services to the end user. Thirdly, computer power

will be strategically deployed to avoid major business interruptions caused by natural or unnatural disasters. Fourthly, data will become more accessible and easy-to-use tools will be available to the end user to develop unique and flexible decision support systems.

The message I would like to leave with you is that this does not happen overnight. It requires very serious commitment to the development of a strategy with objectives three to five years in the future. It needs the endorsement of corporate management and the dedication of all the tactical planners in that timeframe to achieve the desired ends.

The audio visual slide presentation by Mr. Brophy shown at this time is not included in the record.

MR. GODFREY PERROTT: I would like to spend a few minutes talking to you about computer graphics. When we think of computer graphics, most of us think of presentations made to major clients or to our board using such devices as pie charts, bar charts, or superimposed curves. They can show either the components of a whole and their relative importance or how the components have varied over time. Sometimes we think of graphics in terms of showing two-dimensional relationships. In these areas computer-generated graphics can significantly reduce costs and time. At the present time 35mm slides or view-foil overlays generated by computer can be done for about half the cost of conventional artist-created slides or view-foils. Normally the objective is to present stark, clear information and artistic talent beyond drafting and lettering is not required. Computer-generated graphics are not only cost effective, but they can also be produced much faster.

This is an important use of graphics, but if we think only in terms of presentation, we are limiting our exposure and utilization of a new technology that can improve our control of expenses and time. I recently attended a seminar on graphics in which everyone else was an engineer. As a result of that seminar, I would like to describe two other areas in which graphics can be used very effectively to enhance productivity and reduce costs. They are, first, to enable us to perceive complex relationships more clearly, and secondly, to do repetitive data entry. Both of these applications need graphic terminals. They are not static applications.

In terms of the first use of enabling us to perceive complex relationships more clearly, it is easy to display a two-dimensional image of a three-dimensional surface on a graphics terminal. Further, it is a relatively trivial task to move the surface around as the viewpoint of the observer changes. It is uncanny how much of a feel this gives you for a surface. It is like flying over it in an airplane. Most of the business problems we deal with are not two-dimensional. For example, new business written is at least a function of advertising budget and of first-year commission rate. The more we can understand about multi-dimensional relationships, the better equipped we are to manage.

To give you an idea of the productivity gains that have been achieved, Boeing decided to use computer-aided drafting in the design of the 767 aircraft. They estimated that it would cost them $100 million to install computer-aided drafting including education, changing procedures, etc. They estimated that if they were to build 300 aircraft, they would save about $340 million. To date their actual experience is ahead of their projection.

The second area that graphic terminals can be used to improve productivity is in enhancing repetitive data entry jobs, particularly in underwriting and policy service. Most of us are familiar with menu-type operations where a list of functions is presented on a CRT tube and the operator selects the correct one for the task to be performed. The use of graphic terminals can enhance this to an extent that I had not conceived until I saw a film two weeks ago. The film was produced in 1978 by Bell Telephone labs and shows a prototype long-distance operator's console. The concept that is presented in this film is keys that can have difference functions depending on the situation.

Film Presentation

A film was presented at this point. For those interested, an article titled "Computer Displays Optically Superimposed on Input Devices" by Ken Knowlton can be found in the Bell System Technical Journal. The following is the preface to that article.

> A set of pushbuttons on a console may appear to have computer-generated labels temporarily inscribed on them if the button set and computed display are optically combined, for example, by means of a semitransparent mirror. This combines the flexibility of light buttons with the tactile and kinesthetic feel of physical pushbuttons; it permits a user to interact more directly with a computer program, or a computer-mediated operation, in what subjectively becomes an intimately shared space.
>
> A console of this design can serve alternately as a typewriter, computer terminal, text editor, telephone operator's console, or computer-assisted instruction terminal. Each usage may have several modes of operation: training, verbose, abbreviated, and/or special-privilege. Switching from one mode or use to another is done by changing the software rather than hardware; each program controls in its own way the momentary details of visibility, position, label, significance, and function of all buttons.
>
> Several demonstrations are described, including a prototype of a proposed Traffic Service Position System (TSPS) console, and an interactive computer terminal resembling a Picturephone set with a Touch-Tone pad. Also suggested are combinations of computed displays with x-y tablets and other input devices.

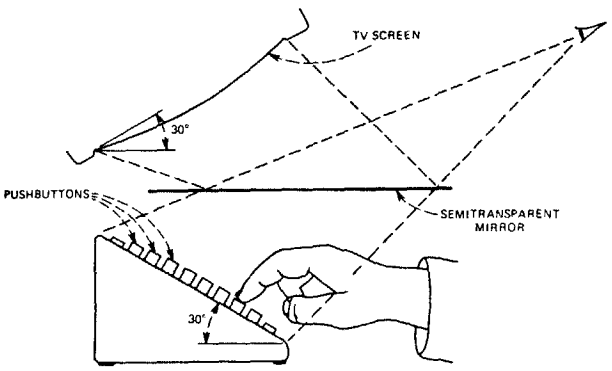

Fig. 1—Basic arrangement for superimposing a computed display on a two-dimensional array of buttons.

Current Applications of Computer Technology

There are five applications of computer technology to the insurance business which I would like to cover. These are Adjustable Life, Universal Life, Flexible Premium Annuities, agency service, and uses of microfilm.

New England Life is moving into the Adjustable Life field to support their pension business. They see it as a way of avoiding large numbers of small policies. They are implementing it on their large mainframe computer (an IBM 3033). Their approach to implementing Adjustable Life will will be to replace the program calls to factor look up routines in their current programs with calls to factor calculation routines.

First Penn Pacific has developed a system to support Universal Life on an HP3000. They were formed to write Universal Life business exclusively and one of their initial strategies was to make maximum use of the computer. They looked at, but rejected the various CFO derivative systems and chose to write their own system to support Universal Life. They owe their success to their selection of high-level design analysis. They feel that a company that underestimates the complexity of Universal Life administration will not be successful.

United Fidelity is adminstering Flexible Premium Annuities on a Micro-Data Reality minicomputer. There is an excellent article describing their experience in the January 1981 "Interpreter" published by IASA.

EDS offers a life system LMS2 which they are currently updating to operate in a data base environment, which they feel has sufficient flexibility to handle any new product that is at present on the market.

I talked to several companies that are involved in different ways with agency support. Mutual Benefit has put together a network of minicomputers to provide proposal services to their agents. They have also implemented a word processing package and agency accounting package on these minicomputers. They purchased most of the software and have developed some in-house. They are using the same miniframe for each general agency but have different peripherals depending on the size of the agency.

New England Mutual is one of the strong mainframe companies. Their agencies are on line to the main computer and they can get ledger illustrations and loan quotations on their terminals. During underwriting, agents have an on-line status system that will identify the status of any application in process.

First Penn Pacific has taken the opposite approach and has 25 to 30 Radio Shack TRS-80 minicomputers in the field. They selected this microcomputer because:

1. Service is widely available at any Radio Shack store.

2. It has the lowest cost of any micro that can effectively be used for business.

3. It has better software development tools than most other micros.

The last area that I would like to talk about is microfilm. Microfilms has come of age in two major areas in the computer era. These are Computer Assisted Retrieval (CAR) and Computer Output to Microfilm (COM). Microfilm has been used commercially since 1926, but in the past it was as much or more work to file the microfilm so that it could be retrieved as it was to do the microfilming. Computer Aided Retrieval has vastly simplified this. As each document is microfilmed onto a cassette, the document is automatically stamped with the address of the image in the cassette. This address is then keyed into the computer data base to indicate the location of this item. If the item is changed or replaced, the new address is keyed in and this data base is updated automatically.

It may help if I give an example of how this becomes effective. Maryland Blue Shield has the basic details of each claim in an on-line data base and telephone operators can retrieve these details immediately from the computer data base. The data base also contains the addresses of supporting microfilm documents. In the event that the operator needs these supporting documents, they note the microfilm addresses, walk over to the microimage reader, load the appropriate cassette, and bring up the images. They can then make dry paper copies of these immediately and return to the telephone to complete the call. Maryland Blue Shield has reduced their call-back rate to under 1% (i.e. the number of times the operator has to take a number and call back because the information is not available) and answer the average query that requires reference to microfilm in 1.13 minutes.

Kodak estimates that CAR micrographics systems are cost effective when one or more of the following conditions exist:

1. A central file area has 20 or more file cabinets and requires two or more full-time clerks.

2. 1,000 or more documents are filed each day.

3. 60 or more retrievals are made each day.

4. Excessive out-of-file conditions are a problem in servicing customer inquiries.

Computer Output to Microfilm is an older technology that has reached the point that it is now frequently cheaper than paper. COM consists of equipment that will accept a magnetic tape from a computer and print that tape to microfilm. The individual microfilm elements are assembled into a four-inch by six-inch plastic sheet called a microfiche which contains 208 pages in the most common size. A larger reduction is also available that contains 690 pages.

Microfiche can be indexed automatically based on a key field or fields within the data. For example, a valuation listing showing policies by valuation basis, plan, and age could be set up so that a change in valuation basis automatically caused a new fiche to be started and each change in plan automatically started at the top of a column on the fiche. Images are normally arranged in columns rather than rows. Each fiche would be indexed with the valuation base and plan of the first page on the fiche in letters large enough to read with the naked eye. To read any pages on the fiche, a special reader is required whcih are typically available for $250.

The advantages of COM are that microfiche can be duplicated very cheaply, are cheaper to store and mail, and completely eliminate the tasks of decollating, bursting, and binding associated with printed output. For those interested further in COM or CAR the January 1981 issue of "Best's Review" contains a couple excellent articles on the subject.