CHAPTER V

INFORMATION COMMUNICATION AND DISSEMINATION; A REVIEW OF CURRENT TECHNOLOGY

1. Introduction
2. Development and storage of information
3. Information retrieval
4. Software designing systems
5. Networking
6. On-line systems
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1. INTRODUCTION.

Information outputs of R&D, the basic inputs needed in an R&D system and the need for development of integrated information system are the issues discussed in the previous chapters.

In the current chapter, the role of information technology (IT) in diffusion of results of R&D and kind of infusion that IT can provide to focus further developments are developed.[1]

The term IT encompasses the use of various technologies that have emerged out from information from the point of generation to the point of use. It includes; (1) Information storage technology (2) Information retrieval technology and (3) The software designs for interface with end users.[2]

2. DEVELOPMENTS AND STORAGE OF INFORMATION.

The developments and storage of information in various sectors, in conjunction with computer technology act as trigger for further development. They range from smaller microprocessor and to a kind of reducing cost and increasing quality syndrome. The current day storage technology can store large amount of information in much cheaper storage media. The capacity of the diskette storage systems now extensively used on the majority of IT systems has increased phenomenally, with the introduction of much wider range of winchester disks storage systems. These are now available for not only to store but also more information is
accessible and easy to retrieve by a wide range of criteria. New systems are appearing frequently such as optical laser scanning system, the cost justification is much easier in company with the modern electronic storage system with the standard filing systems such as microforms.

Perhaps, the storage system still in vogue is a floppy disk. This has been made of plastic material. The surface of which is quoted with magnetic compound on which information and data is stored. Housed in the card envelope for protection, a floppy disc looks like a gramophone record. Recently a new type of diskette storage medium as appeared. The 3.5" diskette which is housed in a rigid plastic case is now being used extensively by many microcomputer suppliers. The small size of diskette does not mean that they store less information. In fact, size does not govern the storage capacity and these smaller disks usually store more data than their larger counter parts.

On an average the diskettes are capable of storing 240 A4 size paper of the text with the capacity of largely depending on the type of diskette we use, for e.g., some of the 8" diskettes are now capable of storing one mega bytes or more data which is over 400 pages. Diskettes are now available on single side and capacity of 80 pages. Double sided single density with a capacity of 100 pages. Double sided double density diskettes are capable storing more than 300 pages.

The most interesting development on the storage media is the winchester disk. The winchester is a large scale hard disc
which is fixed permanently into a computer and cannot be handled by users developed originally by the IBM for use on their processing machine. Disks storage has made a revolution in business system. Like floppy disc, winchester disks vary in different sizes being 3.5" version. Their storage capacity vary considerably 1 or 2 MB for the cheaper 3.5" winchester to 40 MB and more for 5.2 versions. One of the major problem with the winchester disc is that when they have been filled to capacity, data has to be either deleted or purged or transferred to another system for medium to long term storage or archiving. Winchester consists of a solid metal disc which is covered with magnetic recording medium to a floppy disc and then sealed in airtight box. The disks are made-up of metals, because the can spin much more rapidly and can be sealed to make it dust proof. A winchester discs can hold 20 or more floppy diskettes on a similar sized unit. A 10 MB winchester disk which stores about 6,000 pages of texts. The cost of adding a winchester disk to a micro computer is around Rs.20,000/- depending on the type and size of the disk.

Use of such hard disks provide scope for time-sharing of information, which ultimately reduces the cost of operation. In addition to winchester discs we have wide range of hard disc storage systems. These have been discpacks, which consists of a number of winchester disks or a switch packet which can be loaded on metal box.
The range of hard disk systems are used in a large computer with number of peripherals linked together in chains to share central resources. It is only on such systems the extensive softwares such as STAIRS and STATUS can be studied.

2.1 Conventional hard disks systems.

Conventional hard discs systems can also be used for long term storage or archiving. However, many users choose to use systems called STREAMER TAPES. These are tape storage systems, which are capable of storing large amount of data on magnetic tape. They are ineffect, a much larger version of cassette tapes used in home computers. Streamer tapes are easy to store data and when the data being retrieved, access is very slow because the whole tape must be read and retrieve the data. These tapes can also store large amounts of data in a cheap and fairly accessible format.

One of the recent developments in the computer storage system is the optical systems. The optical system stores data slightly below the surface of the disk making i.e., therefore, less vulnerable to the damage of disk. The disk can hold 50,000 or more pages of texts of A4 size, including pictures, diagrams, graphs, drawings and so on.

Information stored on most optical discs cannot currently be edited or processed as data is stored as a kind of photograph. Electronic Research work is in progress to resolve this problem of digital form in optical storage system. These diskettes carry the acronym "Worm" or Write Once read many times. Its means the
user can store data on the discs but data cannot be altered or manipulated in any way.

2.2 CD-ROM or compact disks.

CDs are also optical storage disks which have been developed from the music industry. CD ROM is an acronym for Compact Discs – Read Only Memory. By these very information CD Roms are storage systems and the information it provides more or less the same type. Companies active in optical discs include such as company like Philliphs. This seems to have a system "Megadoc Electronic" document storage and retrieval system. It is capable of being edited.

The DOR (Digital Optical Reading) is capable of being amended and edited. The DOR disk can stack 30,000 picture pages or 5,00,000 text pages. Thus the optical disks in variety of its forms are picking up as an alternative to print or paper.

There is another system which is document image processing system. This system was designed to eliminate most paper handling problems and acts as multi-user system for millions of document images. This system captures images of documents, drawings, texts, graphs illustrations, information and stores them in digitised electronic form on an optical disc. In addition, the Keyed in data and information using word processor and computer is also captured by the system. This information is stored on the optical disc and then indexed for later retrieval by an image base management system. The system
includes integrated workstation. A sophisticated windowing device which can simultaneously display images from documents in one window and the text in another window and interact with a main frame computer in a third window. This means that users who have to access a main frame computer and then retrieve paper documents and refile them will now be able to retrieve and display files of document images and utilise main frame software capabilities simultaneously. The primary advantage of this type of system is to find and enable the user to get the data text document on a screen with no syndrome of lost files, mistaken files etc.

It has also got automatic mailing, if required and access by other terminals on which printed copy, if required. This system has three basic elements: 1) The document entry system; (2) The image management system; and (3) The integrated workstation and printer.

Each of the main elements has its own monitors. It can run on UNIX operating system, which can interface with a LAN. A typical of medium size system comprising 10 workstations, one document entry station plus an optical storage and retrieval unit and one shared printer. Such a system would cost around Rs. 1 million.

3. INFORMATION RETRIEVAL (IR).

The IR system consequent to the variety of information storage system, variety of retrieval technologies and techniques
are built-in. In the case of full text storage system it is possible to retrieve the text using any key term such key terms are linked to controlled vocabularies to provide multipoint searches. So that precision and exhaustiveness is obtained. Besides this several varieties of IR technologies can built-in to draw information.

Software technologies can be built to retrieve information in variety of forms using image scanner to capture an digital image of one page that captures notes, charts and texts. Images will include bar charts and printed material and annotated pages of financial reports, an article from a newspaper etc. Once the images are captured in digital form the data can be manipulated by search operations as: 1) display and alteration (2) Image and text integration; and (3) Forms of management.

Another method of reading of text into a computer system is through an optical character recognition system (OCR). Such a system uses an optical array to scan written text and transfer the image to the magnetic disc storage system. Once stored on such a system the text can be altered, amended and manipulated.

4. THE SOFTWARE DESIGNING SYSTEMS.

The computers can store and retrieve data in two basic forms

1) Search for retrieve documents and records produced on the computer using the word processing facility. This is achieved by using boolean algebra which deals with statements.
2) The second way of retrieving using the data base management systems software (DBMS) programme through which specific record can be set up on the computer and retrieved on the search strategy system.

The most significant development system is the relation DBMS, which identifies to relate the data stored and identify the common area of interest, for example, in a multiple DBMS, which enable the number of data bases to be developed within a single system. These data bases may also include relational fields to enable cross searching to find common and related data. This provides for a better system towards searching information. For example products using three data bases, namely 1) Companies which will include details of the products made by each company; (2) Markets which can include products sold in the market; and (3) Data base on products themselves where the common factor is the product.

In relational DBMS each of the sector market, products and companies which will have their own individual database covering all the fields and requirements specified by the user. However, each will also be capable of related to one or both of the other data bases to enable related searches to be undertaken. This enables the users the link of the data bases together and using various search criteria, for example related products to companies and markets.

Recent developments in information management has led to the development of expert systems in the field of information
science. It seems that, the potential of expert systems for information and ease of use was recognized early. Expert systems which contain a knowledge base which is rule-based system. An inference ranging the facts contained in the knowledge base and the user interface which provides interactive facility.

5. NETWORKING.

One of the most exciting emerging developments in which library and information science community can participate is networking. Networks come in various configurations depending on the job in hand and on such factors as cost, speed of transmission, free from error, whether the configuration be of that start using hierarchical are bus networks. The question of control remains critical. This depends on the trade off between operation complexities of decentralized networking and the expensive in built facilities of heavily centralized system. These days heavily dedicated lease lines star systems are proposed to be networks. Such a system includes a spectrum of activities. One network for communication for document delivery, processing, for information and knowledge.[2] However, despite all the experts mind integrated switch development network (ISDN), it is hard to be use in common use in libraries. A more practical proposition would be LANS. Design to enable the individual work stations to share data. This can link groups of personal computers together to a main frame. More sophisticated versions wutg file are servers cabled to every item on the network can help to share micros and peripherals.
1) Application software and data as well as functioning rapid communication via, electronic mail

2) LANS are now in every day use and as well is providing gateways through X-25 capability with other L/NS and PSS. The trend is towards adoption of the X 400 standard for document delivery.

Problems continue however notably at the interface between LANS and also in respect of the continued high cost of customer controllers, the devices used to connect the user terminal or computer to LAN cable. Nevertheless the future looks bright for networking. As has already begun to happen with stand alone house keeping systems the trend is towards a linkage of networks by means of open system interconnections (OSI). This ultimately promises for the advantages of LAN.

6. ON-LINE SYSTEMS.

Current day telecommunication and satellite technologies and the development of high speed modems have given capacity to access on-line to referred databases and selective dissemination of information (SDI) type of services. On-line retrieval appears to be the most common use of large scale bibliographic databases. However, today attempts are being made to provide variety of other on-line services such as cataloguing services, interlibrary loan requests, video texts, emerging on-line order for book seller, access to storage companies information and processing power of large main frame computers.
The process of end user access has already derived considerable attention. The trend towards end user access everywhere discernible from the increasing access of publishing. Access formulas to the growing tendency of information industry to market its products and services direct to the end user. The development of such end user services helps information professionals to change its roles from information intermediary to information councilors, Advising users on which database to search, but leaving the searching and expenditure to the end user.[3] Further, the acquisition of information is infact a symbiotic activity for information scientist and their customers and that such factors as CD-ROMs and front end software will continue to keep the balance between central and personal information activity.[4]

The development of computer based information service effectively highlights on adoption in the field of IT. Standards for videotext provides for telecommunication companies, computer or standard for hardware and software capability have become important. The finally if the full potential of ISDN is to be retrieved for question of standard the user networking interface must be faced in the international level. Without an adequate and sensible approach to the standards goal of systems transparent to the user will be all the much more difficult to attain. Moreover if we cannot mitigate the problems attendant upon different command langauges, protocols and operational
procedures let alone the duplication of expensive equipment, then the inevitably benefits accruing from implementation of the new information technology will be severely limited.[5]

Thus, development of standards and adoption of standard in an IT is a must for integrated information system.

8. CONCLUSION

There has been a rapid improvement in the emergence of new technologies for information storage processing, access, retrieval, dissemination and display of information. This has facilitated better abilities to transfer information the targets of use. We have now the capacity to make information animate and move towards users' workstations. The next three chapters, we shall discuss the goal-oriented information flow in and R&D cell. While information is an enricher of all aspects of R&D, there are conceptual demarcation to meet the desired outputs. This analysis is presented in the form of information for products, patents and publications.
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