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INDEX**INFORMATION TECHNOLOGY****CONCEPTS AND SYSTEMS**

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Information Technology Concepts & Systems

1. Introduction to computer & its components.
2. Personal Computers - I/O & Storage devices,
Operating Systems - MSDOS, WINDOWS, UNIX.
3. Selection of hardware & software.
4. Word Processing - WordStar, MSWord.
5. DBMS-Foxpro.
6. Application Software - CDS/ISIS, SOUL.
7. Databases - Bibliographical & Non Bibliographical online systems.
8. CD - ROM Technology.
9. Network - Information & Communication Networks
NICNET, INFLIBNET, OCLC, INTERNET.

INFORMATION TECHNOLOGY

Role of IT in Libraries, its Concepts

LAY-OUT

- Introduction
- Meaning
- Definition
- Need
- Objectives
- Scope
- Impact
- Conclusion

INFORMATION TECHNOLOGY**INTRODUCTION**

Information Technology is one of the major roles of today to shake our society and the institutions particularly our libraries must change to meet the challenges in educational technique. "IT" may be defined as a combination of computer and telecommunication techniques, which makes possible new systems and products to help people.

"IT" is the application of wide variety of electronic technologies such as computer, telecommunication, micro graphics, reprographics, video recording etc. for the storage, retrieval, reproduction and dissemination of information in the Library environment

MEANING

"IT" means application of various technologies such as computers, telecommunication, laser, reprographics, micro graphics and video recording for effective information handling.

I. DEFINITION

"IT" may be define as "the scientific, technological and engineering discipline and the management technique used in information handling and processing their application, computer and their interaction with men and machine and associated social, economic and cultural matters" - UNESCO.

NEED

- To cater the needs of users.
- To equip themselves in IT applications.
- To filter information.

- To automate library
- Speedy process of information
- Access information at global level.
- Influence library directly or indirectly

OBJECTIVES

- Supporting technical functions in an institution.
- Supporting information storage, retrieval and dissemination.
- Managing information and analysing the statistics.

SCOPE OF IT IN LIBRARY

"IT" is operative in the following environment: -

- Library management - classification, cataloguing, indexing.
- Library automation - organising, databases house keeping.
 - Library networking - resource sharing and information dissemination.
 - Reprography - Microfiche, microfilm optical disc.

Technical communication - Technical writing, editing, publishing, DTP

etc.

IMPACT

The impact of information technology are: -

1. Electronic Library: -

The electronic library is otherwise called as digital library or virtual library. In this computer is acting as a store house of information, document, Audio visual material stored in a variety of media.

2. Electronic Library: -

We are getting information through channels from sources. The rate at which information we get is depending on the capacity of the channel. E.g. - Satellite, weather report.

3. Transferring information: -

Transferring means information being collected and selected or recognised and re -arranged this repackaged information is transferred through out the world within a second through Internet. E.g. - E-Mail.

4. Strong & Displaying information: -

Information is stored in many forms in the recent IT techniques. Twenty encyclopedia's information can be stored in a CD - ROM. This is important in libraries preserving this information for a long time and displaying information within a second is done through the "IT" development.

CONCLUSION

The present day libraries have become multimedia centres due to the adaptation of technological advances and changing nature of this service. All types of libraries are involved today in a period of revolutionary change.

INTRODUCTION TO IT LEVEL -1

Introduction: -

The word computer literally means one, which computes. It is a Latin word "To Calculate". The term information is a Latin word came from "Inforamatique".

Computer is a machine that is all concerned with "Data". Data are a collection of facts in raw from which become information after proper organization or processing. Data: Data is made of characters. A character is any letter, digit, symbol etc. (Eg) A, B,a,b, 1,2,(), * etc.

Information: When data is analysed and processed, it becomes information. Knowledge: When information is disseminated and assimilated, it becomes knowledge. Programme: Set of instructions given to a computer in which it works. Definition: Oxford English Dictionary defines,

1. "Computer is an Automatic Electronic operators for making calculations or controlling operations that are expressible in numerical or logical".
2. "A device that operates upon information or data".
2. A computer can store, process and retrieve data as and when desired, so many people started calling it as data processor.

Introduction:

1.Speed: -

Computer is a very fast device. It performs operations in seconds. Whenever we talk of computer speed we say in

Milliseconds	(10^3)
Microseconds	(10^6)
Nanoseconds	(10^9)
Pico seconds	(10^{12})

A powerful computer is capable of performing about three to four million simple arithmetic operations per second. 2

.Accuracy: -

The accuracy of a particular computer depends upon its design. Computers too make **errors** but these are mainly due to human rather than technological weakness.

3.Diligence: -

Unlike human beings, a computer is free from tiredness, lack of concentration etc. So, it **can work for** hours together without creating any error & without grumbling.

4. Versatility: -

A computer can perform almost any task.

5.Power of Storage: -

A computer can store and recall any amount of information because of its secondary storage capacity. It has several safeguarding mechanisms & storage information & retrieval of information is very easy in a computer.

6.Capability: -

Computers are capable of doing wide range of jobs. These can manage almost unmanageable things and can perform even impossible looking things. Retrieval and access to the stored information is very fast, accurate and pinpointed. Computer's memory does not forget anything, can search & locate given information within no time.

Purpose of computers in Information Handling: -

Computers can single handedly handle all types & forms of information at one platform. Information is available mainly in three physical forms.

- 1) Numerical form (e.g.) 1,2,3,4...
- 2) Literal form (e.g.) Rama, Tirunelveli etc.
- 3) Graphic Information (e.g.) in the form of graphs, picture etc. Computer is competent enough to store, process, retrieve and disseminate all these types of information simultaneously.

History of computers: -

Computers were invented as a result of man's search for fast & accurate calculating devices. The "abacus" also known as "soroban" may well be the earliest ancestor of the computer.

History of computers: -

In 1647, Blaise Pascal was credited with inventing the first calculator. In 1842, Charles Babbage came out with his new idea of Analytical Engine. ENIAC (1943 - 46): - (Electronic Numerical Integrator and Calculator) It was the first Electronic machine, which was produce in USA to satisfy the military need. It lookup space in a 20 & 40 square feet room & 18,000 vacuum tubes. It is limited to store information and difficult to detect errors in programme EDVAC (1946 - 52): - (Electronic Discrete Variable Automatic Computer) Dr. John Neumann introduced this on the stored program concept. The data can be stored in the memory of the computer.

EDSAC (1947 - 49): - (Electronic Delay Storage Automatic Calculator) Designed by Prof. Maurice Willies. This machine executed the first program automatically in 1949.

UNIVAC (1951): - (Universal Automatic Computer)

- It was the first digital Computer.
- 1952 - IBM introduced 701 commercial Computer
(IBM - International Business machine)
- ? 1953 - improved models of the UNIVAC 1 & other 700 - series machines.

COMPUTER GENERATIONS: -

The term generation is used widely after 1964 for both hardware & software. There are totally 5 generations known till today.

FIRST GENERATION: - (1942 - 59) - "Vacuum Tube"

The early computers like ENIAC, EDVAC and EDSAC are the first generation computers.

They used vacuum tubes, which was fragile glass device that could control and amplify electronic signals.

SECOND GENERATION: - (1959 - 64) - "Transistor"

The Transistor is considered as the brain of the computer. Many thousands of individual components had to be assembled by hand into functioning Circuits. It is costly.

THIRD GENERATION: - (1964 - 75) - "Chips"

The advent of micro - electronic technology made possible to integrate a large number of circuit elements into very small surface of silicon known as "Chips". This new technology was called as integrated chips.

This generation includes Magnetic core & solid-state main storage, which is smaller in size with better performance.

FOURTH GENERATION: - (1975 -90) - "Integrated Circuit"

In the starting period, the IC was only ten to twenty components, named as small scale integration. It helps to integrate 100 components on a single chip. It has greater increase in storage capacity & speed.

FIFTH GENERATION: -

Scientists are now forming the fifth generation of computers. In programming it interact with human beings in ordinary language. The artificial intelligence is developed in this generation.

TYPES OF COMPUTERS: -

There are 3 types.

1. Digital Computer

It works on digital. The computer stores information in "digital" form (i.e. -binary 0 s & 1 s). It uses numbers to stimulate real time processor.

2. Analog Computer

The basic difference between the earlier type and the analog computer is simple. Analog computer measures but a digital computer counts.

3. Hybrid Computer

It combines feature of Analog & digital computers. This computer system utilizes the measuring & counting.

CLASSIFICATION OF COMPUTERS: -

The 3rd & 4th generations can be divided into 4.

1. Main Frame

- It can process large numbers of data at a very high speed.
- It can support many I/Q & Auxiliary storage devices.
- It have multi user facilities and support large network.

2. Mini Computers

The difference between mainframe & mini is very less. The storage can be up to 2 Megabytes. It can accept & transfer data from I/O devices at the maximum speed of 4 million bytes per second.

3. Micro Computers

It has CPU in a single chip. Low storage capacity up to a maximum of 10 KB. It can accept & transfer data from I/O devices at the maximum speed of 5 Lakh bytes/sec.

4. Super Computers

It is very fast & playing a vital role in all areas from space to sports. The storage capacity is in the range of millions of bites per chip.

COMPONENTS OF COMPUTER: -

The main parts of a computer are

1. Input Device.
2. Output Device.
3. Central Processing Unit (CPU).

These 3 main parts are called the Hardware. The parts other than the CPU are called the Peripherals. PC is really a collection of separate items working together as team. The basic components of Computer are as follows:

1. Central Processing Unit.
2. Visual Displaying unit or Monitor.
3. Keyboard.
4. Floppy Disk Drive (FDD)
5. Hard Disk Drive (HDD)
6. Mouse.
7. Printer.
8. Scanner.

Central Processing Unit: -

The processing unit receives data & instructions, stores them temporarily & process the data as per the instructions. This part contains the following three units,

1. Memory Unit.
2. Arithmetic Logical unit and
3. Control Unit.

Memory Unit: -

The memory unit holds all data instructions and results temporarily, the memory consists of hundred & thousands of cells called "storage locations" each capable of storing one word as information. The memory unit is called by different names such as storage, internal storage, primary storage, and main memory.

Arithmetic Logic Unit: -

The unit is used to perform all the arithmetic & logic operation such as addition, multiplication, comparison etc. Ex: Consider the addition of two numbers A & B, the control unit will select the number A from its location in the memory and load it into the arithmetic logic unit, then it will select the number B and add it to A in the arithmetic logic unit. The result will then be stored in the memory or retained in the arithmetic unit for further calculations.

Control Unit: -

This unit co-ordinates the activities of all the other units in the system. Its main functions are

1. To control the transfer of data and information between various units.
2. To initiate appropriate functions by the arithmetic unit.

Monitor: -

A PC monitor works like a television displaying text characters and graphics in colour or in shades of gray. The image we see on the screen is made up of tiny dots called pixels.

A monitor is called a screen display or a CRT (Cathode Ray Tube). Whatever is typed on the keyboard get displayed on the monitor screen. Also whenever a program is executed the information is displayed on the monitor.

Keyboard:-

The keyboard is very much like a standard typewriter with a few additional keys. The basic QWERTY layout of characters is maintained to make it easy for the trained typists to use the system. The additional keys are included to perform certain special functions such as loading a text. These are known as function keys that vary in number from system to system.

Function keys help users to perform automatically many tasks that would be tedious & time consuming on an ordinary typewriter.

Floppy Disk Drive: -

The most common storage medium used on small computers today is the floppy disk. It is a flexible plastic disk coated with magnetic material & look like a phonograph record.

Type of Floppies: -

Floppies are in different sizes.

1. Single Size
2. Double Size

The actual volume of information depends not only on size but also on the density with which information can be recorded. The 5 1/4 inch has become a standard on in the industry. Recently 3 1/2 inch floppy disks have been announced for use in portable computers. Hard Disk Drive: -

Another magnetic media suitable for storing large volumes of information is the hard disk, popularly known as Winchester disk.

A hard disk pack consists of two or more magnetic plates fixed to a spindle, one below the other with a set of read / write head. The disk pack is permanently sealed inside a casing to protect it from dust & other contaminations thus increasing its operational reliability & data integrity.

Winchester disk posses a number of advantages compared to the floppy disks.

1. They can hold much larger volume of information compared to the floppies.
2. They are very fast in reading & writing.
3. Hard disks are not susceptible to dust & static electricity.

Mouse: -

A mouse is a hand - held pointing device that allows us to control our computer without having to type in instruction at the keyboard. The mouse cursor is generally an arrow mark, which moves on the screen in correspondence with the movement of the mouse over a flat surface.

Printer: -

Printer is a device that produces written images (Numbers, alphabets, graphs etc.) on the paper. After a document been created on a computer, you can send it to a printer for a 'hard copy', generally known as a printout. The speed of the printer is rated either by pages per minute or by characters per second. The more the dots per inch, the more detailed is the output. Printers come with many different shapes, sizes & printing technologies.

Scanner: -

A scanner is a device that can transfer an image of a photograph or written information to the computer. It acts like a photocopy machine. Just instead of making another copy of it on to the paper, it stores it in the computer. Scanners can scan typed or handwritten text, graphs, diagrams & photographs.

Joystick: -

A joystick is a most popular input device used to play video games. A joystick uses a level to control the position & speed with which the joystick is moved into digital signals that ara sent to the computer to control the cursor movement.

Light Pen: -

It is also like a pointing device. It is used for graphics work, especially for computea aided design purposes.

DISK OPERATING SYSTEM

Introduction

The acronym DOS stands for Disk Operating System. The operating system for many computers is the Disk Operating System (DOS) developed by Microsoft. It is called as a disk] operating system because much of its work involves managing disks and disk files.

DOS is a program that controls every part of the computer system and provides complete control over what computer does and does it do? In other words, DOS provides a linkag between computer hardware and software programs.

Initially, Disk Operating System (DOS) was released by Microsoft in 1981 and the firs version was numbered 1.00. Over the years disk operating systems have been upgraded with added features. With each successive upgrade, the DOS version numbers changed to 1.1, 1.25 and 2.0, until the current version 6.2 for MS - DOS.

There are two versions namely, PC - DOS and MS - DOS for PC written by Microsoft. PC - DOS was written for IBM personal computers (PCs) and MS - DOS for PC compatible or non - IBM PCs. However, both art almost similar. After the release of DOS 4.0, Microsoft and IBM developed disk operating systems independently for each year. In early 1993, Microsoft released MS - DOS 6.0, later in 1993, IBM released PC - DOS 6.1. Both the versions were very similar except minor changes of key disk and memory management utilities. Several months later Microsoft released an upgrade version MS - DOS 6.2.

Program

A program is a set of instructions written in computer languages. These instructions are stored in files and tell your computer to perform a task. File

A file is a collection of related information. For instance, file folders may contain letters, memos, monthly progress report etc. Files in disks can also contain letters, memos, data, program etc. There are three types of files namely,

1. Text Files.
2. Command Files.
3. Application Program Files.

Text Files

Text files are data files that contain characters, numbers and symbols. For example, the DOS text editor or word processing programs store their programs in text files.

Command Files

A set of DOS commands put together to perform a specific task which can later be stored in a text file are called command files.

Application program files

An application program file such as word processor is stored in a command file; it stores our work such as documents in data files.

File name

As each folder in a file cabinet has a label, similarly each file on a disk has a file name. A file name has two parts; a file name and an extension. E.g. VENKAT.EXE

KAVI.TXT

ARUN.DDE An example of file name extension

is as follows:

REPORT.DOC

Directory

A directory contains an entry for each file that gives the file's name, extension and size (in units called bytes), the date and time, it was created or last modified.

Volume label

Any diskette or fixed disk can be assigned a name or volume label to identify its contents. A eleven character name can be assigned to the disk at the time of formatting. DOS stores the

-volume lable on the disk and displays it when you use the Directory, Check Disk, Label or] Volume Command.

Control key functions

Keys Description

CTRL + S

CTRL + C CTRL + PrtScrN

To stop/continue the scrolling or the screen display, press and hole down the control key and press S key. Scrolling can also be done by using <Ctrl + NumLock>

To stop a command, press control key and C key at the same time or press <Ctrl + Break>

Pressing <Ctrl + PrtSO key combination once causes DOS to *sti* printing every line, as it is displayed; pressing <Ctrl + PrtSc> second time stops simultaneous displaying and printing. We *ci* also use <Ctrl + P> for this.

CTRL + ALT+DEL

To reboot or restart DOS, press the Control, Alternate (ALT) and Delete (Del) keys at the same time.

Dir Command

To view the contents of the directory of the current disk drive, type dir which is the Directory command.

```
C:\>dir
```

DOS displays the directory of the current hard disk.

CHKDSK command

The CHKDSK command is called the check disk. It examines the status of a hard disk and displays a status report.

MKDIR or MD command

The make directory (MKDIR or MD) command is used to create a directory or subdirectory. The only parameter you must include is the subdirectory name.

CHDIR or CD command

The change directory (CHDIR or CD) command is used to display the name of the current directory or change from one directory to another.

RMDIR or RD command

The remove directory (RMDIR or RD) command is used to delete the directory that is empty.

Tree command

The tree command allows the structure of the directory like the branches of a tree. It lists the full path of each directory along with the names of their subdirectories.

DOS plays a vital role in the operation of a computer. It provides a link between the hardware and software. It provides the link between the CPU and the peripherals as well. Disk operating system is specific for stand alone system as well as networks.

WINDOWS 95/98

INTRODUCTION

Windows and Windows for workgroups operating systems provided a graphics environment, networking and performance enhancements to the MS-DOS operating system. Now one integrated operating system takes you to the next level of usability, power and access to PC resources.

The first thing you will notice in Microsoft Windows 95 is a truly easy graphical interface that makes it dramatically simpler to use your PC while at the same time more efficient and customizable. You can install modems, CD-ROM drives and other peripherals, confident that those devices will configure themselves automatically to your system using plug and play technology.

The Windows 95 operating system can run your current MS-DOS based and windows based programs in a more stable environment and in many cases even faster. It also enables a new world of robust 32 bit programs that use pre-emptive multitasking and multithreading to perform several actions at the same time. Windows 95 also offers enhanced multimedia, more powerful mobile features and integrated and seamless networking. You even get new tools for traveling the "Infobahn". For organization Windows 95 provides an opportunity to out overall computing costs while increasing the efficiency of users and those who support them. This help you reduce the support burden of PCs, increase control of the desktop and improve end-user productivity.

Advantages of Windows 95

Windows operating system - easiest way

Navigate your system quickly with powerful new tools.

The star button and taskbar are your primary jump off points for working with programs and documents.

Windows Explorer units File Manager, Program Manager, Control Panel and Print Manager from Windows 3.1 into a more efficient tool for browsing and managing your PC's resources.

Plug and play frees you from manually setting up hardware devices. Windows 95 detects and configures plug and play compatible devices automatically.

Customize and use resources efficiently just click the right mouse button wherever you are working and a context menu appears in order to help you manipulate objects directly.

Microsoft exchange is your one stop in box for your viewing and working with such things as electronic mail from multiple sources, faxes, documents and bullet in boards.

A faster, more powerful Windows

Work on several tasks at once, with fast, new 32-bit programs that support pre-emptive multitasking and multithreading and run in their own memory space, so errant programs can't affect one another. Focus on your documents instead of the programs that created them. Programs use OLE, Microsoft's strategic object technology, let you create and edit documents easily allowing you to work not only within a single document, but within multiple programs. Built-in networking, Windows 95 network ready, providing easy 32-bit access to network resources, even simultaneously. Play today's hottest games on Windows 95, thanks to faster graphics support for Windows based action games.

Start button

By default, the start button and taskbar are located at the bottom of your screen when you start Windows for the first time. By default, they are always visible when Windows is running. When you click the start button, you will see a menu which contains everything you need.

Command	Description
Programs	Displays a list of programs you can start.
Documents	Displays a list of documents that you opened previously.
Settings	Displays a list of system components for which you can change settings.
Find	Enables you to find a folder, file, shared computer or mail message.
Help	Starts Help. You can use the Help. Contents, index or other tabs to find out how to do a task in Windows.
Run	Starts a program or opens a folder when you type an MS-DOS command.
Shutdown	Shuts down or restarts your computer or logs you off.

Depending on your computer and the options you have chosen, you may see additional items on your menu.

Taskbar

Whenever you start a program or open a window, a button representing that window appears on the taskbar. To switch between Windows, just click the button for the window you want from the taskbar.

UNIX.XENIX

Xenix is an operating system for networking and multiuser environment.

A directory contains the names and incode numbers of the files within it UNIX/XENIX uses incodes internally to organize file systems. Incodes contains information about files like the file type the number of links to the file the size of the file the files access permissions, the identity of the files owner and group the last modified file time and the location of the file on the disk. There is one incode per file.

Scheduler

The scheduler is a program that allows more than one user to use the computer at the same time. It shares the computers resources among all the users allowing each small slice of the computer's processor. This concept is known as time sharing.

Shell The shell is the UNIX/XENIX system's command interpreter. It is program that reads the lines; you type in at the terminal and perform various operations depending on what you type in

when users log into UNIX/XENIX system they communicate with one of several interpreters. Each invocation of this interpreter is called a shell and each shell; has one function to read and execute commands from its standard input. Because the shell gives the user a high level language in which to communicate with the operating system UNIX/XENIX can perform tasks unheard of in less sophisticated operating systems. Commands that would normally have to be written in a traditional programming language can be written with just a few lines in a shell procedure.

The System Administrator

System Administrator is a person in charge of system maintenance and operation. He provides the smooth operation of the system and performs tasks that require special privileges. The System Administrator should keep a log of all system modifications and system events.

Accounts

The UNIX/XENIX system has two types of accounts:

1. User Account
2. Super user

Account

User Accounts

A user account must be created by super user for a particular user before he/she can log on a UNIX/XENIX system. A user account contains the following information.

Login name	The name by which user is known to the system.
Password	Each user may be given a password to increase system security
Group identification	Each user is known to the system as an individual and as member of group. As a member of a group user may be permitted to access files and directories that user cannot access as an individual.

Home directory Login shell

The place where user finds himself where login to the system.

The program that reads and executes the UNIX/XENIX commands user input. In most cases login shell will be Bourne shell. The Bourne shell uses the dollar (\$) sign as prompt).

Super User Account

In addition to each user's individual account every UNIX/XENIX system has a super user account. The super user account is a special account for performing system maintenance tasks it provides unusual privileges to the system administrator that ordinary users do not have such as accessing all files in

the system and executing privileged commands. In order to perform certain system maintenance tasks the system administrator must log in as the super user.

Directory structure

The UNIX/XENIX system always associated with the each user of the system with a particular directory. When you log into the system you are placed automatically into a directory called your HOME directory. This directory is assigned to you by the system administrator when account was created on the system. The HOME is a place where you keep files that no other user is likely to need. Within the home directory you can have other sub-directories that you own and control. All of the home directories on a UNIX/XENIX system are often placed in the user directory. In this typical tree of files the root of the tree is at top and branches of the tree grow downwards

In the figure the names classification, user, cataloguing, arts, science represent directories and are all node of the tree. At the top of the directory structure or tree is the root directory which is denoted by slash (/). The names designs proposal order and supply all represent ordinary files and they are all leaves of the tree. The file named cataloguing is special device file and the file OP AC is the name of a command that can be executed. Whenever you are inside a particular directory the files contained within that directory immediately accessible. If you wish to access a file from another directory or subdirectory, then you have to give a command to change to the appropriate directory or subdirectory and then access the particular file or you can specify the particular file by its path name.

A path name is a sequence of directory names followed by a simple file name, each separated from the previous name by a slash (/). For example if I just logged into the system and was placed into my HOME directory / user then I could directly reference the directory arts, simply by typing arts. Similarly the relative path name science user/physics could be typed to access the file supply contained inside by science user directory.

All files and directories with the exception of the root directory have a parent directory. The parent directory is located immediately above the given file or directory. The UNIX/XENIX system provides special shorthand notations for the parent directory and for the current directory.

- The shorthand notations of the current directory for example profile names the same file as profile in the current directory.
- The shorthand notations of the directory that is one level higher. For example after logged into the HOME directory/user, the path name would reference the directory / root levels above the current directory. For example if I had issued a ../.. command to change my working directory arts/literature then ../.. refers the directory user.

COMPUTERS-Hardware

Introduction

The physical computers of a computer, its modules and peripherals (the input/output devices and auxiliary storage units), are called hardware. It constitutes:

- a) Processor Unit.
- b) Input Devices.
- c) Output Devices.

I. Hard Copy - Output such as a paper that can be read immediately or stored and read later.

II. Soft Copy - Screen displayed output.

a) Processor Unit

The heart of any computer system is the processor unit, which consists of primary storage, Arithmetic logic units and control elements. These would be taken up later in detail.

b) Input Devices

Input is the process of entering and translating the incoming data into machine readable form so that they can be processed by the computer.

Any hardware item that is attached to the main unit of a computer that houses the Central Processing unit (CPU) is referred to as a peripheral device. An input device is a peripheral device through which data are entered and transformed into machine readable form. Example: Punch Cards, Card Reader, Keyboard Mouse etc.

b) Output Devices

Output is the process of translating data, in machine readable form into a form understandable to humans or readable by machines. The information that is the result of processing is also often referred to as output. An output device is a peripheral device that allows a computer to communicate information to human or another machine by accepting data from the computer and transforming them into a usable form.

Output that can be understood by humans can be categorized as:

- a) Hard Copy - Output such as a paper that can be read immediately or stored and read later.
- b) Soft Copy - Screen displayed output.

Primary Storage Unit (Main Memory)

Primary storage unit is used for four activities Input operations;

Manipulation of text and calculation operations;
Logic/Comparison operations; Storage and retrieval operations.

Data are fed into an input storage area, intermediate processing results are held in working storage area; Final processing results are held in output storage and a program storage area contains the processing instructions. The separate storage locations used for these four tasks do not have built in physical boundaries. A specific storage location can hold input data in one application and output results or program instructions in another.

Primary storage may take one of the three forms;

- a) Magnetic core memory
- b) Semiconductor memory
- c) Bubble memory

Types of Computer Memory

Magnetic core memory

Magnetic core memory consists of small magnetic cores with wires running through them. Electric current flows through the wires and depending on the direction of the current flow electricity magnetizes the core in different directions. The direction of magnetization indicates certain data representation in the CPU. However since this form of memory is bulky, it has given way to newer technologies such as semiconductor memories. Semiconductor memory

All computers made today use semiconductor elements in their primary storage units. This type of memory is made by electronic circuits onto a silicon chip. The two most common forms of semiconductor memory are:

- a) Random Access Memory (RAM)
- b) Read Only Memory

(ROM)

Random Access Memory (RAM)

This is that part of primary storage where data and program instructions are held temporarily while being manipulated or executed. It is called Random Access Memory because any of the locations on the chip can be randomly selected and used to directly store and retrieve data and instructions. RAM is volatile i.e. it depends on the steady supply of electricity and when the power is shut off, everything stored is lost.

Static ram chip

It also provides volatile storage but as long as it is supplied with power it needs a special regenerator circuits to retain the stored data. Since RAM chips are more complicated than dynamic RAM chips because they require more transistors and other devices to store a bit of data. Therefore static RAMs are used in specialized applications while dynamic RAMs are used in primary storage section.

Read Only Memory (ROM)

ROM chip retains the stored data when the power supply is cut. So unlike RAM chips ROM chips are non - volatile. ROM chip may contain micro program control instructions to the entire operating systems. ROM chip can only be read, it does not accept input data or instructions from the users. The actual contents of ROM are set by the manufactures and they are unchangeable and permanent.

ROM is mainly of three types;

Programmable Read Only Memory (PROM) allows a chip to be programmed by the user for converting critical and lengthy operations into micro program that are fused into a chip. Once they are in hardware form they can be executed at a very high speed. Once operations have been written into a PROM chip they cannot be altered.

Erasable Programmable Read Only Memory (EPROM) can be erased and reprogrammed. It needs to be removed from the processor and exposed to ultraviolet light for some time before it can accept any new contents.

Electricity Erasable and Programmable Read Only Memory (EEPROM) can be programmed with special electric pulses.

Bubble Memory

Bubble memory is non - volatile but it is not widely used as semiconductor memory because it is slower and more expensive. Bubble memory is built on a thin piece of the mineral garnet where certain sections are polarized (subject to a magnetic field) to produce bubble - like areas. Data are represented by the presence or absence of these bubbles.

Optical recognitions

Optical recognition occurs when a device scans a printed surface and translates the image the scanner sees into a machine readable format that is understandable by the computer. Optical recognition are of the following types:

Optical Mark Recognition (OMR)

It employs marks sensing to scan and translate, based on its location, which is a series of pen or pencil marks into computer readable form. For instance the objective type multiple choice question paper we get in the bank recruitment exam. A computerized optical mark reader scores the test by identifying the position of the mark.

Optical Bar Recognition (OBR)

This is a slightly more sophisticated type of optical recognition. Have you seen a series of thin black bars and spaces on the back of few books? They are bar codes or product codes, which are arranged to represent data, such as the name of the manufacture, and the type of the product etc. A optical bar reader recognizes and interprets them on the basis of the width of the lines. The bar code is read by a scanner and the price and product are then matched by the computer.

Optical Character Recognition (OCR)

This is the most sophisticated type of optical recognition. An optical card reader works in much the same way as the human eye. It recognizes specially shaped numeric and alphabetic characters.

A set of optical characters may be used to print merchandise tags that **can be read** using an OCR reader. To process the sales transaction, the formation on the tag such as **item price** and the inventory number can be automatically entered at a point of sales terminal. Pertinent data can be saved and transferred to the company's main computer system to used in activities such as managing inventories and analyzing sales.

Output Devices Hard copy devices

Hard copy devices can be broadly divided into two categories:

1. Printer
2. Plotter.

Types of Printers

Dot matrix Printer

It uses printer heads containing nine to twenty four pins. These pins produce patterns of dots on the paper to form the individual characters.

Dot matrix printers are very popular as they are relatively inexpensive and typically print at speed of 100 - 600 characters per seconds. These printers can give us draft quality, standard quality and near letter quality prints.

Daisy wheel Printer

This printer is used in order to get the quality of type found on typewriters. The daisy wheel printer is so called because the print mechanism looks like a daisy. This printer gives us letter quality print but is slow, typically 25 - 55 characters per second.

Line Printer

Line printers or line-at-a-time printers used special mechanisms mentioned above than can print a whole line at once. They are very fast in speed ranging from 1200 to 600 lines per minute.

Ink - Jet Printer

Ink - jet printers form characters on paper by spraying ink from tiny nozzles through electrical field that arranges the ink particles into characters at the rate of approximately 250 characters per second. The ink is absorbed into the paper and dries instantly. Various colours of inks can also be used. Although this might sound like a messy way of printing, ink jet printers are reliable but expensive.

Laser Printer

When speed and quality comparable to typeset material are required and cost is not a matter, a laser printer is the solution. They produce images on paper by directing a laser beam at a mirror, which bounces the beam on to a drum. The laser leaves a negative charge on the drum to which positively charged black toner powder will stick. As the paper rolls by the drum, the toner is transferred to the paper. A hot roller bonds the toner to the paper.

Laser printers use buffers to store an entire page at a time and that is why they print very fast at the rate of approximately 21, 000 lines or 437 pages per minute.

Plotter

A plotter reproduces drawings using pens that are attached to movable arms. The pens directed across the surface of a stationary piece of paper. High quality bar graphs, pie charts created with a plotter gives a very good quality output.

Visual display unit (Monitor)

A monitor is a television like device used to display input data or information allowing users to view the results of processing. Quality of the monitor is often judged in terms of resolution which is a measure of picture elements, or pixels, a screen contains. A pixel is smallest increment of a display screen that can be controlled individually. The higher the number of pixels, the clearer and sharper is the image.

WORDSTAR**Layout:**

Definition:

Word Processing

Advantages

WordStar

Opening Menu

Block Operations

Print Control Commands

Conclusion

Word Processing

Word Processing in computer terminology refers to the typing, editing and formatting of any kind of document, which could be a letter, a memorandum, a balance sheet or something similar. As the term suggests a word processor simply processes words (i.e.) textual information. We can use it to print letters, reports, booklets and so in suitable layout. Word processing supports many features such as adjustable margins, boldface, underlines text, italics, spell checking and correction.

Advantages of Word Processing

It helps in printing error free documents in the desired format. Any number of copies may be printed without retyping and all the printouts look like the first copy. Most of the word processing provides the facility of checking spelling and making corrections.

Word Processing helps in preparing documents through special features such as boldface, underlining, strikethrough, centering of text, adjustable margins, tabs, The word processor allows us to move a block of information from one place to other.

Available Packages

The packages available in Word Processing are WordStar, MS Word, Power Point etc. WordStar is a package available in DOS prompt. MS Word is a package available in Windows operating system. In MS Word, the words can be used in different styles and fonts. The menus can be selected through keyboards and mouse. Different pictures can be selected from clipart. They can be used in background. So, MS Word can be used for those purposes. Similarly Power Point has these facilities. We can use paint option in Power Point. Different colours are available in Power Point. WordStar is available in DOS Prompt. We can select our options using the menus available. WordStar has several functions for printing, aligning etc. So these are the packages available in Word Processing. WordStar has different menus such

as opening menu, editing menu, printing etc. We can select those menus and perform different operations.

WordStar

To load WordStar from hard disk we follow the following steps,

- Type c:
- The WordStar directory is usually named as Ws4.

To select the Ws4 directory,

- cd Ws4
- Type Ws.

Now the PC loads the WordStar.

Opening Menu

On loading WordStar, the PC screen displays some messages and after a few seconds it displays the opening menu. As the opening menu suggests, this is WordStar's main menu. The opening menu can be used to perform many functions, (e.g.) to open a document, to print a file, to rename/delete a file and to copy a file. The functions available are

- D Open a document
- N Open a non-document
- P Print a file
- M Merge print a file
- I Index a document
- T Table of contents X Exit
- WordStar Help
- L Change logged drive/directory
- C Protect a file
- E Rename a file
- O Copy a file
- Y Delete a file
- F Turn directory off
- Esc Shorthand
- R Run a DOS

command As soon as we open a document we enter into the edit menu. These are many edit commands.

Block Operations Making a Block (^ KB and ^ KK)

We can mark a block for a particular operation using ^ KB and ^ KK commands. ^ KJ refers to the beginning of the block and ^ KK refers to the ending of the block.

Deleting a Block (^ KY)

The marked block can be deleted using the command ^ KY. So first we mark the block to be deleted by ^ KB and ^ KK, then we delete the block using ^ KY.

Moving a Block (^ KV)

If we want to move a particular block from one place to other we use the ^ KV command | Now we mark the block using ^ KB and ^ KK commands. Now move the cursor to the position where block should be moved and press ^ KV. Now the block is moved to other place.

Copying a Block (^ KC)

The marked block can be copied to any number of places we want. So to copy a block can use the command ^ KC. First we mark the block and move the cursor to the particular position where it should be copied and press ^ KC. The content is copied here too.

Hiding a Block (^ KH)

When we mark the block and do certain operations the block remains highlighted.. So turn off the highlighted one we use ^ KH command. So when we use ^ KH the marked block disappears.

Writing a Block to a File (^ KW)

We can write the marked block in to another file using ^ KW command. Mark the block and press ^ KW. It asks the name of the file where to be written. If we give the file name block is written there.

Save and Resume Editing (^ KS)

The save and resume edit (^ KS) command writes the document on to the diskette finishes editing. WordStar returns to the opening menu.

Save and Exit WordStar (^ KX)

We can save a document and exit from WordStar by using ^ KX.

Print Control Commands**Bold Face (^ PB)**

To print a particular text in bold face we use the command ^ PB. The ^ PB command should be printed before and after the word. So the particular word will be printed in bold face. Underline (^ PS)

To underline a particular text we can use the command ^ PS. We can press ^ PS before and after the text to be underlined. We can see on the monitor is WordStar may not underline the text on the screen, but the text is underlined when printed.

Double Strike (^ PD)

Double strike command is used to strike the letters twice to make them appear darker. Bold face appears darker than double strike. So ^ PD is used to make the text to be double stroke. ^ PD is used before and after of the text.

Strike Out (^ PX)

The strike out feature is used to strike a particular piece of text. ^ PX is used before and after the text to be struck out. So we can mark ^ PX before and after the text and it is struck out. Subscripts and

Superscripts (^ PV / ^ PT)

In certain texts we need the usage of subscripts and superscripts for (e.g.) when we want to print $(A+B)^2$ we can use the superscript command ^ PT. We can type it as $(A+B)^{2^{\wedge}PT}$. Now this text may be printed as $(A+B)^2$. Similarly, for subscripting, (e.g.) H_2O . We can subscript H_2O as $H^{\wedge}PV\ 2^{\wedge}PV$ and this is subscripted as H_2O .

Italics (^ PY)

To print a particular word in italics style we can use the command ^ PY. We can use this command before and after the word to be written in italics.

Conclusion

WordStar Jiglps in preparing documents through special features. Beginners can use WordStar very easily!

DATABASE MANAGEMENT SYSTEM**Introduction**

A database is a concept of file organization. It consists of related files stored together so that groups of data items can be easily accessed or retrieved by those who need them. The data are integrated so that individual datum can be accessed in a variety of ways. A Database Management System (DBMS) is the software that functions as the interface between users, other programs and the database itself. It allows the data to be stored maintained, manipulated and retrieved.

Database Design Concepts

Computers, operate on data. They accept process data and communicate results. The data supplied to a computer must generally be organized in a predetermined way to satisfy the numeric, alphabetic or alphanumeric (numeric and alphabetic) forms demanded by the particular program in use. The basic hierarchy of data organization going from the general to the specific is database file, record and filed.

DATABASE

A database is a concept of file organization. It is a collection of related files stored together in a logical fashion.

FILE

A file is a collection of similar groups of data which fit under one heading. For example payroll file of a company consists of the salary detail of all employees and all of these records have the same heads (e.g. basic pay, D.A., H.R.A., CCA. interim relief, G.P.G. etc.)

A file may be further divided into more descriptive subdivisions called records. The material in a record is specific to that particular record but falls under the same topic as that of the file.

RECORD

A record may be of fixed length or variable length. A fixed-length record is one where each record is set to have a specific number of characters. For instance, if the record length is set at 30 characters then only 25 characters are used then only 25 characters are used and 5 empty spaces are stored with the data.

A variable-length record is the one in which places are allotted only to data. For instance if only 25 characters are used the only 25 characters are used. This method saved storage space.

Management Systems (DBMS)Database

Database management system is a package that allows users to define data items, place these items in specified records, combine these records into designated files and then manipulate and retrieve the stored data to fulfill the user's requirements. It supports many separate files and can access appropriate records from two or more files at once.

DBMS permits users to search and query database contents in order to extract solution to unplanned and non-recurring problems. The users can use this package to assemble the needed data items from a common database and get solutions so their queries. It is very flexible and easy to use package.

Features of database management system

The basic features of file management systems (a program that stores, manipulates and prints data stored in separate files) and database management systems permit the user to create, maintain and manipulate the information stored within a file. These features are common to almost all database packages, but depending on the software packages, the actual commands used to execute them vary.

Creating file

To create a database, we need to type command CREATE and press the RETURN key. Then it will ask us to, enter the name of the new file: LUX (any name). After giving the name LUX to the file, it will ask the information about the field in each record. For each field, it needs to know the name, type, width and number of decimal places. The structure of LUX database looks like:

Field name	Type	Width Dec
1. AUTHOR	character	100
2 TITLE	character	150
3. ACCN.NO.	NUMERIC	15
4. CALL NO.	ALPHANUMERIC	20

After entering all filed names, just save this file. Every database package allows users to carry out these file-creation activities and the other operations described follow.

Entering database records

Once file specifications have been set, just type the command APPEND for entering the new data to the database file. It will bring us a form to fill out on the screen.

Record No.	6
NAME	RANGANATHAN. S.R
TITLE	LIBRARY SCIENCE
ACCN.NO.	212
CALL NO.	2

Sorting

Generally, it is easier to read data if they are arranged in some redesigned order. Sorting records means to arrange them in order. The sort can be numerical or alphabetical and the data can be arranged in ascending or descending order.

Deleting

Removing records from a file is called deleting. It is wise for the user to keep a backup copy of the file to have, in case of accidental deletion. Individual fields within a record can also be deleted. After the data are deleted, those data items are no longer available.

Updating

Updating is the process of changing the content of a record or records in a database in a database file. This updating might be adding, deleting or changing the contents of a record. By accessing records and changing the field contents, the computer user can keep all the records current.

Searching

Searching a file means to look through a file and to locate data. Searching for data may also be called finding, retrieving by some systems. One file at a time is searched with a file management system, but multiple files can be searched in DBMS. A database management package derives much of its power from the ease with which it can sort records and search for answers to a wide range of questions.

Merging database files

Merging (joining) files is combing records from two or more files. The records found in two files can be merged, only if some logical relationship exists between the files.

Copying

The copying feature permits the user to make duplicate files to store in another location. For example, a temporary created from the merging of two files may be copied into a new permanent database file.

Printing

The printing feature permits the user in print the contents of the screen at any time. Sometimes it is required to print only raw data to check the error, occurred at the time of entering

Structure of database management packages

The structure of Database Management Packages are used to organize the data elements in three basic ways:

1. Hierarchical database structure.
2. Network database structure.
3. Relational database structure.

The Hierarchical database structure resembles an upside-down tree with the root at the top and the branching formed below or resembles an organization chart of a corporation. The president has many vice-presidents, who have many subordinates. There's a superior gnih subordinate relationship in this structure. One might view structure as an upside-down family At the top level of the data is the parent or root level. Data found under the root level are at the child or subordinate level. Each parent can have numerous children but each child can have only one parent. Each child level may also be broken down into further levels with the wild becoming the parent for the next level as shown in the figure a customer record may own street address, credit rating and invoice elements and these elements may have subordinate items.

The network database structure is similar to the hierarchical structure; it is more complex but also more flexible in accessing data items. Similar to a hierarchical structure, each parent can have more than one parent. This structure permits the connection of the nodes in a multidirectional manner. Thus, each node may have several owners and may, in turn, own any number of other data units. The network database structure is a more versatile and flexible data access structure than the hierarchical type because the route of data is not necessarily downward. It can be from any direction.

The relational database structure manages data in more than one file at once and these files are treated as tables with rows and columns, rather than as list of records. Each table column represents a database field and each row a database record - sometimes called a tuple. Table can be linked to pull various data elements together. The relationships between data items do not have to be defined during the datahn development.

The relational data model

The Relational Data Model (RDM) was formally introduced in 1970. Since that time, it was undergone extensive study. The relational model frees the user from details of stores, structures and access methods. It also conceptually simple and, more importantly based on sound theoretical principles that provide format tools to tackle problems arising in database design and maintenance.

Basics of relational database management systems

The different terms used in the relational database model are being discussed here.

1. Entities

An entity is simply a person, place event or thing for which we intend to collect data. For example, in a university environment, entities of interest might be pilots, aircraft, routes, suppliers and any number of additional items for which data must be gathered.

2. Attributes

Each entity has certain characteristics known as attributes. For instance, the student entity might include the following attributes: Student number, major and so on. Similarly, the airline might define these attributes for its aircraft entity: aircraft number, date of last maintenance, total hours flown, hours flown since last maintenance and so on.

3. Relation

The relation is the only data structure used in the relational data model to represent both entities and the relationships between them. A relation may be visualized as a name table Figure shows the two relations EMPLOYEE and DESIGNATION using a tabular structure. Each column of the table corresponds to an attribute of the relation and is named.

4. Tuple

Row of a relation is referred to as tuple. A tuple having a set of n numbers of attribute is termed as n - tuple.

5. Domain

The values for an attribute or a column are drawn from a set of values known as a domain.

FOXPRO

INTRODUCTION TO FOXPRO

Foxpro is one of the leading data base management system [DBMS] software for the PC. This is an enhanced and updated version of the Foxbase + software.

One of the first DBMS for the PC was developed by Ashton - Tate in 1979 - 80. That was called dBASE II. Then the updated version of the dBASE II was called dBASE III. Soon dBASE III became the industry standard. Later Ashton - Tate released the updated version of the dBASE III as dBASE III plus.

To get a share of the expanding DBMS market for the PC segment, Fox software inc. came out with FoxBASE +. That was almost compatible with dBASE III plus. Then it was updated and the new software was called Foxpro. New versions of Foxpro were released to make it more powerful and user friendly. This widened the gap between dBASE and Foxpro and now they are partly compatible.

Definition: -

The database is an organized collection of related information. Foxpro is also called the Relational Database Management System [RDBMS].

Uses of Foxpro [Functions]: -

1. Foxpro is used to design database files as per the requirements.
2. Foxpro is used to enter and manage the data in the database files.
3. Foxpro is used to edit, view, change data in the databases through simple built - in -commands.
4. Foxpro is used to retrieve selected information and the retrieved information can be displayed or printed as per the desired report format.
5. The best part is that the data stored in the database is flexible to change, modify the contents as well as the structure of the database any number of time.
6. We can use Foxpro on a Local Area Network (LAN) where several persons work simultaneously on different applications. Foxpro runs under 4 OS i.e.) DOS, windows, Unix, Macintosh.

Loading Foxpro: [in DOS]

First select the drive and directory that contains Foxpro. For e.g.:

If Foxpro is installed in the Foxpro directory in drive C, select drive C, then Enter C: then Change the directory to Foxpro by entering cd Foxpro Type Foxpro and press the Enter key to start Foxpro. It will display the opening screen.

The highlighted bar on the first row of the screen is called the menu bar. Each word shown in the menu bar is called a menu pad. On selection of a menu pad Foxpro displays a list of options (called menu options) for selection.

The window at the Low right is called the command window. This window is used for entering Foxpro commands for doing various data base operations such as

Creating a database

Listing records from a database etc.

E.g.) if we enter clear command in command window the screen removes the Foxpro Sign-on message but it retains the command window.

Selecting Menu pad:

We can select the menu pad by the mouse or with keyboard with keyboard, we can press Alt key with its first letter of menu pad or by arrow button in the keyboard.

Creation of database file:

Creating a database file implies designing and defining the structure to store some specific information.

The structure defines how the information will be stored in that data base file i.e., how many fields are there in the file and what information is stored also limits the length of data stored in each field.

E.g.) Let us create a database file to store the names and addresses, city, pin code To create a database file by selecting File- New. This displays the following menu. To specify the structure for the address database file, we have to specify the following

- A unique field name for each field (i.e.) each field must have a name that is not being used by another field.

- Field type (i.e.) the type of data such as numeric or character to be stored in each field.

Width of each field. For numeric fields, also specify the number of decimal fields. Field names can be up to 10 characters long. They must begin with a letter (A - Z) & numerals or underscore in between them. The data types are characters, numeric, float, date, logical, mem, general. After creating the structure, save the structure. Foxpro automatically assigns the file active extension name 'dbf' to the file name. After saving the dbf file Foxpro displays input data ndia) •hical r and a co-lities arch records now? Press yes and enter records in Foxpro.

Commands used in Foxpro:

List:

The list command displays the contents of all records on the screen.

List Fields name, city:

Displays the name and city.

E.g.	Record	Name	City
	1	Suja	Delhi
	2	Subbu	NewyorkE-

List Off:

Suppress the display of record numbers.)

Close Databases:

Foxpro closes the address database file. Use Address:

Opens the database file.

Append:

This command is used to add more records in the database file.

List For name='subbu':

It searches the name and lists the records.

Create:

Instead with the help of Foxpro menu system we can use create command in

Edit is used to change the data e.g.) if a person moves to a new address we need . to change the data in a database.

Browse width 10:

- It resizes the width by 10

Browse fields name, city:

This command will open only the name and city

for editing. Delete record 2:

It deletes the record 2 but the record 2 displays the first field

Recall:

Recall the deleted one i.e. it marks it for deletion.

Pack:

This command permanently removes deleted records from the database file. Modify structure:

This is used to modify the structure of the database.

Sort on name to A: NameList:

This sorts on the contents of name field of address and save the sorted to namelist. Then to see the sorted one use name list. Index on name to A: NameList: Like sorting but Record number are same before indexed the file. Foxpro does not change the database file in any manner. It only creates an index file based on the index field.

Features of Foxpro Report:

1. The report title can have any number of lines. It includes fields memory variables and functions.
2. The width used for a fielding the report can be different from that used in the data base file.
3. Report title can be printed on every page or only on the first page.
4. The page size, margins etc., can be enclosed in a box.
5. Print styles, such as bold, italic, underline etc., can be applied to any part of the report.
6. Any part of the report can be enclosed in a box.
7. Calculations such as sum, average, maximum, minimum etc can be performed on the numeric data.
8. A report format can be used with multiple database files.

Conclusion:

Foxpro is very easy to understand and it has built in commands to execute the program easily. Now a days database manipulations are widely used to perform projects and these are used in large organizations to store information and to manipulate the data.

In Foxpro, the security is very powerful and we can update the information very easily and Foxpro is a powerful tool to use the database. Foxpro is the best Language, which we used in database. Now a day many earliest versions of databases are available but Foxpro is the one, which gives more use to the users. Since it is older it is the powerful database Language.

CDS / ISIS

Computerised Documentation System/Integrated Set of Information System

Introduction

It is a versatile & user-friendly library software package developed by UNESCO. It came in 1986 & work on IBM compatible computers running under MS-DOS operating system.

System Overview

It was specially designed for the computerised management of structured non-numerical databases containing mainly textual data. It is a menu driven package. So the user won't need much computer knowledge.

Hardware Requirement

1. One IBM/ PC/XT or other compatible equipment.
2. 1 Floppy Disk Drive.
3. 1 Hard Disk Drive.
4. 1 monochrome or colour monitor.
5. 1 printer.

Functions

1. It contains necessary data elements defining databases containing necessary data elements.
2. Entering new records into a new database.
3. Modification, correction or deletion of existing records.
4. Automatic creation of fast access files.
5. Displaying of records according to user defined formats.
6. Sorting of records in any desired sequence.
7. Developing specialised applications.

Services

The above functions are performed through a set of major services. These services can be categorised into 2

1. User Services.
2. System Services.

User Services

ISISENT - Data entry & record editing.

ISISRET - information retrieval.

ISISPRT - Production & printed outputs.

ISISINV - Inverted file maintenance & utility functions.

System Services

ISISDEF - Definition of new databases / modification of existing databases.

ISISUTL - Miscellaneous system utility functions.

ISISXCH - Facilities for interchanging data with other systems & master

file utility functions. ISISPAS - Advanced programming facility for developing own application

programs & integrating them with CDS / ISIS

Database

The package has integrated a number of different programs into a single program. All These programs are accessible from a main menu. This package allows a database to contain over 16 million records. Each record consists of data elements that are stored in fields.

Creation of databass

For creation of databases according to CDS /ISIS, four steps must be followed.

Step 1: Definition of fields in the records of the master file using Field Definition Table (FDT).

Database - AGILA**FDT**

Pattern	Len	Type	Rep	Delimiters/ Pattern
1	Author	150	X	R
2	Year	20	X	
3	Title	600	X	

Step 2: Definition of data entry worksheet using the work sheet editor.

Sample Worksheet

Worksheet: AGILA

Author: _____
 Year: _____
 Title: _____
 Reference: _____
 Vol. (issue) a: _____
 Keywords: _____
 Source: _____

Step 3: Definition of the parameters for either online display of records during searching for the generation of printed outputs such as catalogues / indexes by using the formatting language.

Display format 'AGILA'

Step 1:

Definition of the fields of database to be made searchable through the inverted file using Field using

Field Select Table (FST) FST

AGILA TST for INVERTED FILE

ID	IT	D	D	Data	Extraction	Format
1	0			(VI)		
3	4			(V30)		
5	4			(V51)		

Advantages

1. Available to libraries at free of cost.
2. Versatile package.
3. Updating & maintenance is guaranteed.
4. Easy to learn.

Conclusion

If CDS / ISIS version is accepted for use in all libraries in India will be significant step in establishing national uniformity in bibliographic database & services.

SOUL

INTRODUCTION

Modernisation of libraries in India as a subject had attracted the attention of many national bodies & professional organisations during the last two decades. The recent modernisation of university libraries in India is done by an agency called INFLIBNET. It developed software known as SOUL.

INFLIBNET

It is designed as a computer communication network of libraries & information centres using satellite cum terrestrial networking. It would link up the institution of higher learning. It will operate at various levels - national, regional sectoral & local.

FUNCTIONS

- I. Catalogue Based Services.
- II. Database Services.
- III. DSS (Document Supply Services).
- IV. Communication - Based Services.

SOUL

It was designed by INFLIBNET. It contains the following features.

FEATURES

1. Windows based user friendly.
2. Well designed screens, logically arranged functions with extensive help messages
3. Based on client server architecture allow scalability to users.
4. RDBMS to organise & query data. V. Does not need an extensive training.

1. Especially designed for academic libraries.
 2. Multi - user software & no limit on simultaneous access.
 3. Supports CCF & AACR2 etc.
 4. IX. Provides export & import & adheres to ISO2709 format. X.
Incorporates all required feature to work i.e. LAN, WAN.
 5. OP AC is accessible
 6. Provides list of reports, master databases etc.
 7. Provides facility to create, view & prompt records.
- XIII. It covers all operations of a library. XV.
Available at affordable cost.

MODULES

It has six modules.

Acquisition.

Cataloguing.

Circulation.

Serial Control.

OPAC.

Administration

Semester

a)Title

Title is the name or first surrogate of a document. It is the first & most important bibliographic elements by which a document is identified. But often welcome across two or more books having the same title. In such cases, author has the next element. Sometimes title may not be a complete sentence. So, the numbers of key words are essential for knowing its contents. Sometime, the author may appear in title. Some cases, the title may appear in different parts. In such cases, the bibliographer 'Invents' & supplies a title appropriate to the contents. In case of journals citations are essential.

b)Author

According to publishing conventions the title page carries the title in bold letters at the top, authors name in the middle, publishers name & year at the bottom. But in some cases it will be in reverse. Authors name helps to identify a title & secondly it acts as an access point in a bibliographic record.

c)Imprint

Information on publishers, place & date of publication is called imprint. The name of the publishers is used to identify the quality of the work listed. Year indicates the age of the documents. It helps to select

recent books. Publishing as an activity is the reflection of the culture of place. For these purposes inprint statement is essential.

d) Access Points

Each element can act as access point but not all of them can become meaningful access points. An access point first locates a bibliographic record in a file. It relates to one-bibliography elements of a document considered useful for retrieving it.

Structure

Since the design is very important for this purpose better to know the structure. A database contains numerous files. File is made up of several report & each record has different fields & sub fields.

In a bibliographic database, pertaining to a particular subject, there may be several files,

each are dealing with a specific type of document. Each file may contain thousands of bibliographic records. Each record may have several field: & characters. The fields may be fixed or variable. Individual field can be identified & separately manipulated. It matters retrieval of easy & quick.

Logical Database Structure

- a) Hierarchical
- b) Networks
- c) Relational

In this way we can create a bibliographic database.

II. Online Bibliographic Databases

It is a collection of records held on online in a rapid access computer store. It is obvious that records stored in this form are not useful to users unless they are made accessible through online systems. The last two decades saw a tremendous growth in the number of databases. In earlier stage there was a thrust on the development of large well-known database. But of late small specialised databases are also begun to play an important role.

Database Vendors

The increase in number lead to the emergence of database vendor on service suppliers. He is responsible for collection of, compilation of data in to computer readable forms. They may offer these databases to users themselves. They offer a number of databases in different subjects. They operate on an international level. E.g.: DIALOG (Biggest)

- a) 400 databases
- b) SDC - US (system development corporation)
- c) ESA/IRS - Europe (Information retrieval service of European space agency)

Advantages

1. Millions of records can be searched within minutes.
2. There can be more access points.
3. User is actively involved in the search.
4. No chance of missing issue of journals.
5. Easy to switch over from one database to another.
6. Updated information is given.

Cost of database search

1. Communication cost.
2. Database producer's charges.
3. Database access charges.
4. Print charges.

Conclusion

Today, IT has opened a number of new possibilities for establishing several information systems, where bibliographic services were done by automation.

CD ROM Technology**Introduction**

The CD-ROM is a type of Laser disc. It was developed by a joint venture of PHILIPS and SONY. The record itself has a sort of Plexiglas & aluminum. It has a thickness of 1.2mm. The compact disc has a diameter of 12 cm.

Meaning

CD-ROM stands for Compact Disc Read Only Memory. Many information professionals were already familiar with compact discs before the advent of CD-ROM. This has been now adopted for storing bibliographic information.

Memory The CD-ROM has a enormous storage capacity. Its major attraction is presently about 250,000 bibliographic abstracts can be stored on one single CD-ROM. When compared to Floppy disc it is 1,600 times better. In other words the contents of an entire 20 volume encyclopedia can be recorded on a single CD-ROM disc.

Features

The information stored on the disc can be retrieved, displayed, manipulated and printed in many ways, but the user presently cannot alter the information on the disc. This new technology is extremely suitable for archival data storage of bibliographical databases, dictionaries, reference books, catalogues of big libraries etc. It is having flexible retrieval capacity. The CD-ROM

databases can be purchased by a library for a set amount and once purchased can be used as many times as needed without any further cost. Because of this CD-ROM searching is becoming very popular with end users. The systems are easy to use.

Components of CD-ROM (or) Equipments Required

To access the information on a CD-ROM the library needs relatively inexpensive equipment consists of:

- 1) IBM PC - 30 or 100 percent IBM compatible colour monitor.
- 2) The operating system IBM PC - DOS or MS-DOS version 3.1 or later.
- 3) 640 K RAM memory.
- 4) 1 hard disc drive & 1 floppy disc drive.
- 5) One CD-ROM retrieval software.
- 6) CD-ROM discs like COMPENDEX plus.

Need for CD-ROM

a) Tight Budget

A large part of the library world in developing countries face budget cuts of 10 to 20 percent in annual budget. Provision every year for subscription of primary sources of journals. The CD-ROM products can provide better information sources to users in the library.

b) More service to the end user

Independence - Making the data available directly to the end user with all search options, brows ability & experimentation without concern for cost is great advantage of CD-ROM. Having personal access to the database itself & being able to refine or change searches in the process gives a great sense of freedom to end users.

c) No Telecommunication

Placing a disc in the machine and searching immediately is an easier & faster process than retrieving through telecommunication online, entering into vendors database & giving password.

a) Less storage of place is needed

Many librarians like to reduce the large quantity of old print issues by replacing them on CD-ROM. For example the latest 5 year cumulative index of chemical abstracts, engineering index exceeds 75 volumes of 3,000 pages each. This was stored on a single CD-ROM.

e) Less Dependent on Intermediaries

In general there are online help screens, tutorials and menu driven software for the inexperienced user. The end user is better able to define his/her strategy than working through an intermediary.

Conclusion

As on today there are 560 science & technology CD-ROM databases available of various subjects like engineering coverage. CD-ROM includes the major information that can be used with personal computers.

COMPUTER NETWORK**INTRODUCTION**

Network is known as system of Intersecting Lines. One can communicate with any part of the world with fraction of seconds or inter related system. The term used between a systems of computers connected by transmission channels.

NETWORK

A number of computer units linked by communication channel-as in the case of telephone networks.

CONCEPT OF COMPUTER NETWORK

A computer network may be treated as a system having its hardware, Software and data resources, distributed over remote territory. Data bank may be distributed or centralized. This centralized data bank can accessed by many users by means of remote terminals.

VARIETIES OF NETWORK

There are three types of network as following:

1. Local Area Networks
2. Wide Area Networks
3. Metropolitan Area Networks.

(i) Local Area Networks

This is a network Linking computers and other devices within a restricted geographical area, usually not more than a kilometer or two from the central server.

(ii) Wide Area Networks:

This is a network linking several organizations, at national or international Level. (Ex. NICNET, INFLIBNET).

(iii) Metropolitan Area Networks

This is a network, which connects the metropolitan cities of a country.

TYPES OF DATA**i. Voice data Network**

In this network, voice data is carried.

ii. Digital data network

This network carries textual, numerical and other related forms of data in digital form.

iii. Video Type data Network

This network carries the information in video form (i.e. Visual display from of information.)

COMPONENTS OF NET WORK

A LAN has It 's own components, divided as two, Known as: Hardware & software.

Hardware of network

- 1 .Workstation
- 2.Cables

Software

1. Device Drivers
2. Network Operating System (NOS)
3. Network Server Software
4. Server
5. Hub
6. Bridge
7. Gateway
8. Repeater

NETWORK TOPOLOGIES

Physical layout of a computer network is known as Topology. This is the interconnection of devices and communication channels into a network configuration. There are most common topologies:

1. Bus
2. Star
3. Ring
4. Hierarchical

1. Bus Topology

A bus network has a single cable that spans the length of the network. All the network nodes are connected with this cable. The main advantage is, if any of the computer is added or removed does not disturb the system operation. The main disadvantage is if the cable breaks, all the systems will fail.

2. Star Topology

In star topology, each node is directly connected to the network server.. The advantage is, if a cable breaks, that will affect only a single system in the network. The disadvantage is, if the network server goes down, the entire network fails.

3. Ring Topology

A ring topology is a completely closed loop. The computers are connected with one another like a ring. Every data is transmitted among any two computers.

4. Hierarchical Topology

In the hierarchical topology each computer is linked with one another in a hierarchical fashion. Whenever data are to be transmitted among any two computers, these are routed through the next & hierarchical stage.

CONCLUSION

The information technology is growing rapidly through the computer networks. This huge globe is shrinking day by day by these networks.

NETWORKS

NICNET

The NICNET (National Informatics Centre Network) has been set up to link Government departments for decision optimisations. With the successful completion of data communication between NICNET at Delhi and RJE station based on Microprocessor at Ahmedabad through Apple satellite. Linking computer in 16 major state capitals in India to NICNET via the INS AT - IB satellite. This would facilitate the development of interactive databases with query systems for the central and state Governments.

INFLIBNET

The INFLIBNET (Information and Library Network) was launched by the UGC (India) in May 1991. It is useful to communicate between the library networks & bibliographical information centres. It's major national effort to improve capability in information transfer and access that provide support to scholarship, learning, research and academic pursuits. It is a cooperative network and will contribute to pooling, sharing & optimisation of resources, facilities & services of libraries & information centres in the university system as well as in the Research & Development complexes. Its service are based on the database service, document service, E-mail bulletin etc.

The project on information and library networking aims at the establishment of a national network of libraries and information centres in universities, colleges, research and development organization etc. in India.

The main objectives of INFLIBNET are:

1. To a national network of libraries and information centre in the country and to improve information handling capability.
2. To provide reliable access to document collection through online union Catalogue.
3. To provide better access to bibliographic information sources with citation and abstracts through online accessing of international databases held by international information networks and centres.
4. To provide document services by establishing resource centres around libraries having a rich collection of documents.
5. To provide information resource utilisation through shared cataloguing, inter-library loan service.
6. To computerise operations of libraries and information centres in the country following uniform standard.
7. To facilitate communication among scientists, engineers, researchers, social scientists, academics, faculties and students through electronic mail.
8. To enable users regardless of location and distance to access information.
9. To create online information service.
10. To encourage co-operation among libraries.

In the field of information and library science, the term "network" has been used broadly to mean anything from the organizational resource sharing arrangements established among nearby libraries to automated networks such as those operated by bibliographic utilised.

CONCLUSION

The information technology is growing rapidly through the computer networks. This huge globe is shrinking day by day by these networks.

Library networks can be characterized in the following way:

1. They are developed specially to support library technical processes such as she? cataloguing.
2. They provide a particular set of services and are operated by single organisation.
3. They are largely terminal to host networks.

In the year 1963, Ohio College was the first library to establish library network. The sot of OCLC (Online Computer Library Centre) led many library networks to grow in different fee of the world during the last two decades.

The U.S. National Commission on Library and Information Sciences (NCLIS) National Program Document (1975) defines a library networks as:

"Two or more libraries engaged in a common pattern of information exchange, there communications, for some functional purposes. A network usually consists of a *foi* arrangement whereby materials, information and services provided by a variety of libraries) available to all potential users. Library may be in different jurisdictions but agree to serve another on the same basis as each services its own constituents. Computers telecommunication may be among the tools used for facilitating communication among them

INTERNET

The advanced Research Project Network (ARPANET) was one of the first networks supported the interconnections of different computer makes and models, so that communic was possible. The ARPANET demonstrated feasibility of technology. The U.S Department Defence started this network in the year 1960.

ARPANET currently known as ARPA Internet is increasingly gaining importance i.' field of communication. The fundamental principle of ARPANET architecture is based cffl concept that communication between local and remote processes can be accomplished bj identifying the host where the remote process resides, and then identifying the remote pi within the remote host. Both actions can be handled independently. Consequently, the task! network in the ARPANET model is reduced mainly to routing data between hosts.

Digital library deals with information in digitalised as well as electronic form. Dill terminologies such as electronic library, library without walls and virtual library havda interchangeably used to describe this broad concept. An electronic library provides coll and/or services in electronic form such as CD-ROM. Optical videodisc and the like.

Virtual library is that which does not exist physically and most often used to d«p library with distributed collection or services that appear and act as one.

A network of computer networks is called INTERNET.

REFERENCES

1. Handbook of library information systems and services by Dr.J.K.Khanna, 1st 1996.
2. A manual of computerisation in libraries by N.RSatyanarayana, 1995.

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B.L.I.S.C. DEGREE EXAMINATION
APRIL 2010
LIBRARY AND INFORMATION SCIENCE

Paper - V
INFORMATION TECHNOLOGY
(Concepts, Theories and Systems)
(For those who joined in July 1999 onwards)

Time:3 Hours

Max. Marks: 75

Answer any FIVE questions
All questions carry EQUAL marks

(5*15=75 Marks)

1. What is a Computer? Explain its components with a block diagram.
2. Explain in detail the various output device.
3. Explain the steps involved in the selection of Hardware and Software.
4. Explain the salient features of Word Star.
5. Define CD-ROM. Explain its significance is a storage media for a Special Library.
6. What is a Network? Explain the different types of Network topologies.
7. Describe the objectives and functions of INFLIBNET.
8. Explain the salient features of MSDOS.
9. Write short notes on any THREE of the following:
 - (a) UNIX
 - (b) FOXPRO 2.5
 - (c) ILMS
 - (d) INTERNET
 - (e) Personal Computers