UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

Study material

For V SEMESTER

BA ECONOMICS - CORE COURSE (07)

COMPUTER APPLICATIONS IN ECONOMICS

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Layout and Printing:

Computer Section, SDE.

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MODULE 1
PHILOSOPHICAL FOUNDATIONS OF COMPUTING

EVOLUTION OF COMPUTERS AND COMPUTER GENERATIONS

Computers are electronic device used for calculation and logical operations. It manipulates data according to a set of instructions. The ability to store and execute lists of instructions called programmes makes computers extremely versatile, which distinguishing them from calculators. Speed, memory and accuracy are the three major features of the computers. Today’s computers are developed over the past fifty years.

In 1900s a series of complex mechanical devices were used to perform the basic operations of addition, subtraction, multiplication and division. (they were constructed from gear wheels, levers, and pulleys). In 1823, Charles Babbage, an English mathematician, designed a mechanical computing machine for automatic computation of mathematical tables. He called this ‘machine difference engine’. This was designed to accommodate sixth-degree polynomials and 20-digit numbers. The only arithmetic operation to be performed was addition. This machine was not completed and the project was abandoned in 1842. Later, many modest difference engines were successively designed and built. In 1834, Charles Babbage thought of a much more powerful mechanical computer. He called it as ‘analytical engine’. This was a general purpose programmable machine. Its components were similar to those of modern computer. It contained the following components.

1) An arithmetic unit called ‘mill’ where calculations were performed. It is capable of addition, subtraction, multiplication and division.

2) A memory to store data and intermediate results. It consisted of decimal counting wheels. Its capacity was one thousand 50-digit decimal numbers.

3) A mechanism consisting of gears and shafts to transfer data and results between store (memory) and mill (ALU). It was just like a control unit.

4) Input and output devices. Babbage proposed to supply numerical information either by punched cards or by manually setting counter wheels. It was intended to get the output data either printed on paper or punched on cards.

The analytical engine was not completed. Babbage died in 1871. He was the first man to give the concept of programmable machine having components similar to a modern computer, and hence he is called ‘Father of modern computers’.

In 1890 Herman Hollerith developed Jacquard’s punched cards for the purpose of computation. This invention is known as Hollerith desk. It consist of a card reader which sensed the holes in the cards, a gear driven mechanism which could count and a large wall of dial
indicators to display the results of the count. The first electronic computer using vacuum tubes was designed and built in the late 1930s by John V Atanasoff at Iowa State University. It was a special purpose computer for solving simultaneous linear equations. It used about 300 valves. In 1943, a much larger electronic computer called ‘Colossus’ was built in England. It was developed for code breaking.

CLASSIFICATION OF COMPUTERS

Earlier, computers were classified as Microcomputers, Minicomputers, Mainframes (large computers) and Super computers. This classification is no longer used. Low-cost small digital computers are known as micro computers. Portable computers, personal computers PCs (single-user desktop computers), computers for dedicated applications such as industrial control, instrumentation, appliances control, etc. come under the category of microcomputers.

Minicomputers were more powerful than microcomputers. They were multiuser system. Mainframes are very powerful large computers. They are rarely used. They are being replaced by computer network. Examples of some mainframe computers are IBM’s ES2000, ES9000, DEC1000, DECVAX9000, CDC Cyber 2000V, etc.

Today computers are classified as notebook computers (laptop computers) Personal Digital Assistant (PDA, also known as Palmtop computer), Desktop computers PCs, workstations, servers, and supercomputers. Laptop or Notebook computers are personal portable computers. Their power supply is from batteries. They can be connected to a computer network. They use 32-bit processor specially designed for them.

Desktop Computers

Desktop computers are single user PCs. They use 32-bit processors like Pentium III, Celeron, PowerPC, etc. Their RAM capacity is, generally, 16 to 32 MB. They are used at homes, cyber cafes, shopping malls, business institutions, offices, etc.

Workstations

Workstations are more powerful desktop computers used by engineers, scientists and other professionals. They are used for numeric and graphic intensive applications. They are expensive computers and generally employed to run complex programs and display both work in progress and get results. Their hard disk and RAM capacity is more powerful than desktop computers. When a computer is connected to a network, it becomes a node on the network and is referred to as a workstation.

Servers

Servers are powerful computers. A number of PCs and terminals are connected to a server through a communicating network. They have large disk and RAM capacity. A low-end server contains one microprocessor whereas a high-end server may contain more than one microprocessor.
Supercomputers

They are the most powerful computers. They are used for complex computations. They are used for weather forecasting, in aerodynamics, seismology, atomic, nuclear and plasma analysis; for weapons research and development; sending rockets into space, etc. Examples of supercomputers are Cray-1(1976), Cray-2 (1985), Cray X-MP(1983), etc.

Computers can also be classified as Digital computers, Analog computers and Hybrid computers. Digital computers work on the principle of binary mathematics. In binary mathematics all calculations are represented through ‘0’ and ‘1’. They can not only perform mathematical problems but also combine the bytes to produce desired graphics, sounds, images and other such commands. They are the commonly used computers.

An analog computer processes analog signals. An analog signal is a continuous quantity. The analog systems carry out arithmetic and logical operations by manipulating and processing data which we input such as the weight, temperature, voltage, power density, etc. Analog computer measures continuous electrical or physical magnitude like voltage, pressure, water flow, etc. The computing units of Analog computers are able to react immediately to changes in the input variables. They can perform very complex arithmetic operations faster with cent percent accuracy. They are used for some specific scientific and engineering purposes. Today these works are done by digital computers.

A Hybrid computer system is one in which the characteristics of both digital and analog computers are combined. In a hybrid computer the digital and computers are interconnected in such a way that data can be transferred from digital to analog and vice versa. For example, the heart beating rate of a heart patient can be measured can be measured continuously with the help of analog part of the computer and the statistics relating to these measurement may be highlighted in the form of digits supplied by the digital part of the system. Thus such a hybrid system provides both the flexibility and speed.
COMPUTER GENERATIONS

Over the past five decades, digital computers have gone through five generations of development. This division is primarily by the major changes in hardware technology and software. Most features introduced in earlier generations have been passed to the later generations. The latest generation computers have inherited all the good features of computers of the earlier generations. A short description of the various computer generations is given below.

First generation (1946-1954)

The first generation computers used vacuum tubes as CPU components. The high cost of vacuum tubes prevented their use for main memory, less costly but slower devices such as mercury delay lines were used for memory. Electrostatic (CRT) memories have also been used in the first generation computers. Whirlwind I, a first generation computer, constructed at MIT, was the first computer to use ferrite core memory. Machine language or assembly language (developed in early 50's) was used for programming. Fixed-point arithmetic was used. Magnetic tape/magnetic drum were used as secondary memory. There was no concept of operating system. Punched cards and paper tape were invented to feed programs and data and to get results.

The first electronic digital computer ENIAC (Electronic Numeral Integrator and Calculator) was completed in 1946. It used vacuum tubes as components for CPU and memory. Punched cards were used for data entry and getting results. Separate memories were used for programs and data, which made entering and altering programs an extremely tedious task. John von Neumann proposed ‘stored program concept’ in 1946, according to which programs and data were to be stored in the same high-speed memory. This principle was used in other computers of the first generation. Some other examples of first generation computers are: EDVAC (Electronic Discrete Variable Computer, 1951), UNIVAC (Universal Automatic Computer, 1951), IBM’s 701 (1953), IBM 704 (1955), etc.

Second generation (1955-1964)

The second generation computers used transistors in CPU, I/O processors and other electronic components. Transistors was invented in 1948 at AT and T Bell Laboratories and it gradually replaced vacuum tubes in electronic components and devices. The major features are;

1) Transistors were used in place of vacuum tubes.

2) Magnetic ferrite-core memory was used as main memory which is a random access nonvolatile memory. The memory capacity of the 2nd generation computers was 1K bytes.
3) Magnetic disk memory was also developed during this period. Magnetic disks and magnetic tapes were used as secondary memory.

4) The high level languages like FORTRAN, COBOL, and ALGOL were developed.

5) Hardware for floating point arithmetic operations was developed.

6) Index registers were introduced which increased flexibility in programming.

7) Punched cards continued during this period also.

8) Eg: - IBM 1620 (1960), IBM 7090 (1960), IBM 7094 (1962)

Third generation (1965-1974)

The development of integrated circuits in CPU, I/O processors and other electronic components was the hallmark of the 3rd generation computers. In the beginning, magnetic core memory was used as main memory. The size on memory was about 4M bytes. Later, semiconductor memories replaced magnetic core memories. Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers. Semiconductor memories used LSI technology. Introduction of microprogramming, parallelism and pipelining were other developments.

When a CPU contains more than one functional units and each functional unit performs a part of the disk independently, this technique is called pipelining. The CPU of a multiprocessor system contains more than one processor. In multiprogramming, the computer handles more than one program simultaneously. While executing a program I/O processes are involved. I/O operations are slow process. While I/O operation of one program is being performed, computer takes up another program for execution. When data becomes available, the computer goes back to the previous program. Thus it handles multiple programs simultaneously. In a multiuser system, more than one user work on the different terminals of the computer simultaneously. Examples of third generation computers are: IBM/370 Series (1970), CDC 7600 (1969), PDP 11 (1970 16 bit computer), etc.

Operating system for multiprogramming, and multiuser systems were developed. Database management, multiuser application, online systems like airline reservation, interactive query system, automatic industrial control, etc. emerged during this period.

Fourth generation (1975-present)

The 4th generation computers use microprocessor(s) as CPU, memory, I/O processors, supporting chips, controllers, etc. also use ICs (LSI and VLSI chips). The latest microprocessors contain 3 to 20 million transistors. One chip cache memory 8 KB to 64 KB are provided. One chip second level cache 256 KB to 2 MB are provided. The processing speed, packing density
and integration of many components other than CPU into a microprocessor are increasing day by day. Earlier, cache, MMU (Memory Management Unit), etc. were on separate ICs. Now-a-days all such components and CPU are packed into a single IC of the microprocessor. Thousands of integrated circuits were built into a single silicon chip called **Very Large Scale Integration (VLSI)** technology. This technology allowed a complete processor to be fabricated on a single chip known as microprocessor. Examples of microprocessors are Pentium, PowerPC, Alpha, MIPS, SUNSPARC, etc.

The operating systems being used are UNIX, WINDOWS, SUN’S Solaries, etc. 4GL Languages like ORACLE, SYBASE, etc. are being used for database management. Expert systems using artificial intelligence have been developed. Today computers are widely used in industrial control, instrumentation, consumer appliances, research work, analysis and design, games, banking services, offices, military equipment, education, communication and so on.

**Fifth Generation**

The 5\textsuperscript{th} generation computers are expected in the near future. The main features are:

- The computers will use ULSI (Ultra Large Scale Integration).
- The microprocessor will contain first level cache, second level cache, MMU, FPU, multiple pipelines, MMX pipeline, etc.
- Microprocessors will use ‘data flow’ architecture in place of von Neumann architecture.

In Neumann architecture, instructions are executed in a sequential order. The processor fetches one instruction at a time. If data is available the instruction is executed. If data is not available, the processor waits till data is obtained from the memory. Then it is executed.

In ‘data flow’ computer the processor fetches 20 to 30 instructions in advance in sequential manner and puts them in an instruction pool. Now, the processor checks the first instruction. Suppose its data is not available, the processor goes to the 2\textsuperscript{nd} instruction. Suppose the 2\textsuperscript{nd} instruction requires the result of the 1\textsuperscript{st} instruction, then the processor goes to the 3\textsuperscript{rd} instruction. So the instruction is executed. Finally, it again checks up those instructions which were not executed for want of data. When data become available they are executed in the next turn.

- Computer will use extensive parallel processing such as pipelining, multiprocesssystem, etc.
- Natural languages will be used as source languages. i.e. Programming will give commands in English or any other language.
• Intelligent programming will be used. In such a system the programmer will tell the computer what to do, he will not tell how to do. This will be done by the computer. Intelligent software will be used for this purpose.

• Artificial intelligence will be used.

• Computers will be multimedia, knowledge based systems, and will have improved human-machine interfaces. They will accept spoken commands as well.

• Today multimedia computers, microprocessors with data flow design, multiple pipelines, expert systems, special processors for dedicated applications are available. Generally, some features of next generation computers appear in the previous generation. This is the process of technical developments. Some persons put the computers of 1991 onward in the 5th generation.

Artificial Intelligence

A machine with reasoning, learning and logic capability that resemble those of human being can be said to possess artificial intelligence. Expert systems in use are the examples of artificial intelligence.

Artificial system appears to be a mysterious machine. It is, however, an electronic device with no brain. In fact a machine cannot think as we think. It gives its expert opinion based on the information which has already been fed into it. It selects one out of many opinions depending upon input data and information. The selection is based on certain logical functions. The machine is designed to perform on such logical functions. PROLOG and LISP are suitable computer languages for artificial intelligence. The examples of expert systems are medical diagnostic packages, packages for repair and maintenance, training, scientific analysis, engineering design, etc.

Hardware, Software and Firmware

Hardware

The physical devices of a computer are called Hardware. It may be electronic, electrical, magnetic, mechanical or an optical device. Examples are microprocessor and other ICs, hard disk, printer, CD-ROM, keyboard, etc.

Software

A sequence of instructions given to a computer to perform certain task is called a program. A set of programs written for a computer is known as software. The term software includes both system software and user’s programs. The system software includes operating system, assembler, compiler, interpreter, text editor, debugger, etc.
The operating system (supervisory program) is a collection of programs which controls the overall operation of a computer. While making a program certain steps has to be followed. These steps are called ‘algorithms’. A graphical representation of an algorithm is called as ‘flow chart’.

The following chart shows the symbols used in a flow chart.

![Flow Chart Symbols](image)

**Computer Memory**

Memory is an essential component of a digital computer. It is needed to store programs, data and results. A computer uses a number of memory devices of different technologies such as semiconductor memory, magnetic memory and optical memory. The CPU is a semiconductor device and it operates at a very high speed. The speed of a memory should also be very high and it must match the speed of the CPU. If memory is slow, the CPU has to wait for data and instructions. This will reduce the processing speed of the computer. To match the speed of a CPU a very fast semiconductor memory called ‘cache memory’ is directly connected to the CPU. It stores currently needed instructions and data of a program being executed. The next level of memory which is used in a computer system is the main or primary memory. It is also a very fast semiconductor memory. It stores programs and data which are being processed by the CPU. It is cheaper than cache memory. The main memory is connected to cache memory. The currently needed instructions and data of the program are loaded into the cache memory from the main memory.

Semiconductor memory is a static device. It is faster, smaller in size and lighter in weight; and consumes less power compared to other types of memory devices. The main memory of a computer system is volatile. (Cache is also volatile). It holds information (programs, data and results) as long as power supply is on. Therefore, to store programs, data
results and supervisory programs (operating system) a computer must have a permanent type of memory at 3rd level. A permanent memory such as magnetic and optical disks is used at 3rd level of memory. The memory which stores information permanently is called secondary or auxiliary memory. Magnetic and optical memories are cheaper than semiconductor memories and hence they are quite suitable for secondary memory.

The secondary memory is a mass storage device. It stores operating system, compilers assemblers, application programs, etc. Programs, data and results are saved on secondary memory. The magnetic disks and optical disks are not static. They rotate during operation. They are slower than semiconductor memory.

Semiconductor memory

There are two main types of semiconductor memory: RAM (Random Access Memory) and ROM (Read Only Memory). RAMs are used as read/write memory of a computer. They are volatile memory whereas ROMs are permanent type of memory.

RAM. In a random access memory any memory location can be accessed in a random way without going through any other location. The access time is same for each and every memory location. Since information can be written into or read from RAMs, they are called read/write memory of a computer system. It is a volatile memory. It stores information as long as power is supplied to it. Its contents are lost when power supply is switched off or interrupted.

ROM is a non-volatile memory. It stores information permanently. Its contents are not lost when its power supply is switched off. It is not accessible to user, and hence he cannot write anything into it. ROM is used to store permanent (fixed) programs. It is used to store initializing programs of a computer, micro codes of a CISC processor, supervisory programs of a microprocessor-kit, fixed programs in microcontrollers, etc.

Magnetic memory. The magnetic memory is a permanent memory. It is not volatile. It is used as a secondary memory/backup memory in a computer system. Hard disk, Magnetic tape and USB drive are magnetic type memory are used today in a computer system.

Types of software

Software systems are divided into three major types. They are; System software, Programming software and Application software

System software

It consists of variety of programs that support the operation of computer. It includes operating system, assembler, compiler, interpreter, debugger, etc.
Operating system

The most important system software package for any computer is the operating system. It is the supervisory program which is responsible for the direct control and management of the hardware that makes up a computer basic system operations. The operating system is a collection of programs that control the overall operations of the computer. It controls the operations of the central processing unit, input and output units, manages the memory unit and provides various support services to execute application programs. It is also known as ‘executive’ or ‘supervisory’ programs which is permanently stored in the main memory of the computer.

An operating system should be loaded and activated before doing a particular task. When a computer is switched on the operating system program is loaded into the random access memory and prepares the computer to do the required work. This process is called ‘booting’. Many operating systems are designed as a collection of programs which can be used to accomplish various operations. For example, some operating system package includes a selected number of utility programs, language translator programs and even some application programs. Several versions of operating systems are available. The most popular operating system for a micro computer is MS-DOS (Micro Soft Disk Operating System). UNIX is another important operating system which has developed at Bell Laboratories. Windows95, Windows 98 and Windows XP are other popular operating systems by merging MS-DOS and Windows facilities.

In short, an operating system stands between users on the one hand and external hardware and software on the other. A user communicates a computer through operating system. The more friendly the operating system interface with the computer. Thus an operating system enables users to communicate with a computer and also enables the computer to communicate with peripheral devices.

Objectives and Functions of Operating System

An operating system is a program that controls the execution of application programs and acts as an interface between applications and the computer hardware. It can be thought of having three objectives.

(1) Convenience: An operating system makes a computer more convenient to use.
(2) Efficiency: An operating system allows the computer system resources to be used in an efficient manner
(3) Ability to evolve: An operating system should be constructed in such a way as to permit the effective development, testing and introduction of new system functions without interfering with service.

An operating system performs three major management functions in the operation of computer system. They are;
1. Job management

Job management includes preparing, scheduling and monitoring jobs for continuous processing by the computer system. It performs all activities relating to a particular job. For example, the activities include selecting jobs for execution by the computer system, starting the processing of each job, finishing the job and communicating the operator the progress of the job.

2. Resource management

It refers to controlling the computer system resources by database management and other system software and by the application software programs executed by the computer system. These resources include primary storage, secondary storage, CPU all other input-output devices. Effective management of all these resources is highly required for doing the job successfully.

3. Data management

Controlling of input-output data as well as their location, storage and retrieval come under the scope of data management.

WINDOWS

• It is a series of operating systems software and graphical user interfaces produced by Microsoft's Corporations. Microsoft first introduced as an add-on MS-DOS in response to growing interest in graphical user interfaces.

• Now, various versions are there like-Windows7, Windows Vista, Windows XP, etc.

LINUX

• It is a free Unix type operating system originally created by ‘Linus Torvalds’ with the assistance of developers around the world.

• It is developed under the GNU general public license and the ‘source code’ for Linux is freely available to everyone.

• Different versions of Linux are Fedora, Redhat, Gentoo, Libranet, etc.

Operating systems can be classified as follows:

• Single-user, single tasking:– it is designed to manage the computer so that one user can effectively do one thing at a time. Eg- The Palm OS for palm handheld computers.

• Single-user multi-tasking:– Most of the people now using this type of OS on their desktop and Laptop computers. Eg- Windows98, Mac OS, etc. It makes possible for a
user to be writing a note in a word processor while downloading a file from internet and also printing the text.

- **Multi-user, multi-tasking**: It allows many different users to take advantage of the computer’s resources simultaneously.

  Eg- Unix, VMS, and mainframe operating systems such as MVS.

- Real-time operating system: it has very little user interface capability.

### Firmware

Firmware software runs on relatively smaller computational devices like TV remote, washing machine controller, etc. It is generally small and complex. It directly interacts with electronic device.

### Programming software

It is a group of software that helps to create other software. It includes Assembler, Compiler, and Linker. The computer hardware understands only machine code which is only a sequence of 1s and 0s.

**Assembler** substitutes letters and symbols to machine code. Assembly language represents a set of human readable codes. Each code represents a lowest level instruction in a computer. Assembler translates these instructions to machine codes.

**Compiler** is the next generation of programming software that uses an English like language to represent a computer program.

The language will be highly structured and has some keywords to form the program. It is called **high level language**. The compiler converts the high level language to assembly language, and an assembler in tern this to machine code.
A linker is a software that links our software with other software and operating system. The commonly useful software components (linkers) are either available for free or on payment. This reusable block of software is called library.

Examples of programming software are C++, Visual Basic, Java, etc.

Application Software

Application software is designed to do certain user tasks. Typical examples are word processor, spreadsheet, and web browser.

MS Office:-

It includes MS-WORD (for word processing), MS-EXCEL (for spreadsheet), MS ACCESS (for database management) and MS POWERPOINT (for presentation purpose)

Open Office.org

It is an office suite of LINUX. It includes a word processor (Writer), a spreadsheet application (Calc) and a presentation software (Impress).

Photoshop

Abode Photoshop is a graphic editing tool created and published by Abode systems.

GIMP

GIMP is the GNU image manipulation program. It is a free software used for different tasks such as photo retouching, image composition and image authoring. It was originally created for Unix systems and now can also be used along with Windows and Mac operating systems. It can freely downloadable from http://www.gimp.org/

Dreamweaver

Abode Dreamweaver (known as Dw) is a web development application software originally created by Macromedia and is now developed by Abode systems.
Text-to-Speech (TTS)

TTS capabilities for a computer refer to the ability to play back text as spoken words. Now this facility is provided by Apple, Amiga OS, Microsoft speech server, Android, etc.

OCR Tool

Optical character recognition (OCR) tool is the mechanical or electronic translation of scanned images of handwritten, typewritten or printed text into machine-encoded text. It is widely used to convert books and documents into electronic files, to computerize a record keeping system in an office, or to publish the text on a website.

Various software used for this purpose are Readiris, Readsoft, Brainware, Open text, OcardSmartscore, Microsoft Office OneNote 2007, etc.

Speech recognition tools

It converts spoken words to text. CMU Sphinx, VoxForg, Dragon, IBM Via Voice, Philips speech magic, Microsoft Speech API, Simmortal Voice, etc, are some software used for this purpose.

Utility software

It is a highly specialized application software which is targeted to handle a single or a small number of tasks. Utility software generally does a complex task such as configuring a computer, performing tests in hard disk drives, connecting to internet, fixing problems in a computer, troubleshooting, etc. An average user can run the utility software without knowing their internal complexity.

Malicious Software

Malicious software or malware is designed to infiltrate to a computer to do certain tasks beyond computer owner’s knowledge. They are used for user data theft, launching attacks against other computers or networks. Creating and releasing malware is illegal in most of the countries.

Adware

It is a type of malware that generates advertisements such as pop-up windows or hotlinks on web pages that are not part of page’s code. Adwares are not bad by themselves but they become a problem when they are unauthorized. Unfortunately, many adware programs do not give users enough notice or control.

A computer virus is a computer program that can copy itself and infect a computer with out permission or knowledge of the user. It can be spread from one computer to another by a user sending it over a network, or carrying it on a removable medium such as a CD or USB
drive. Viruses can be sub-divided into various types based on their features. i.e., Program viruses – which infect executable program files. Multipartite viruses – a combination of boot sector viruses and files viruses. Macro viruses – they are transmitted in Microsoft applications that support macros, such as Word and Excel. Network viruses – they are quickly spreading over a network (LAN or internet). Boot sector viruses – it infect our master boot record.

Worms :-

Worms are virus like programs that are primarily designed to replicate themselves, but often without infecting other files on the computer.

Trojan horse:-

Trojan horse is a non-self replication malicious software that appears to perform a desirable function for the user but instead facilitates unauthorized access to the user's computer. They require interaction with a hacker to fulfill their function.

Spyware:-

It is a type of malware that collects little bits of information at a time about users without their knowledge. It is an internet jargon for advertising supported software (adware).

Protecting computer from malicious software

There are different ways to protect the computer from malwares. Some of them are;

Antivirus:-

Antivirus software is a computer program that detects, prevents and takes action to remove malicious software programs. Such databases are getting updated every day. So to prevent virus antivirus software is to be updated regularly.

Firewall:-

Network firewall prevent unknown programs and internet processes from accessing the system protected. However, they do not make any attempt to identify or remove anything, but may protect against infection from outside.

Virus removal tool:-

It is a software for removing specific viruses from infected computers. They are used in the case of the severely infected computers.

PHILOSOPHY OF OPEN SOURCE SOFTWARE

Open source software (free software) is a computer software whose source code is available under a copyright license that permits user to study, change and improve the software, and to redistribute it in modified or unmodified form. It provides four types of freedom to the user.
(1) Freedom to run the program in any place, for any purpose and forever.
(2) Freedom to study how it works and to adapt it to our needs. This requires access to the source code.
(3) Freedom to redistribute copies, so that we can help our friends and neighbors.
(4) Freedom to improve the program and to release improvements to the public. This also requires the source code.

Some other terms associated with free software are;

(a) **Freeware**: These are gratis programs. They are normally distributed in binary format, and can be obtained free of charge. It is frequently used to promote other programs or services. eg:- Skype, Google Earth, Microsoft Messenger.

(b) **Shareware**: This is not even gratis software. This program can be copied freely, generally without source code, but not used continuously without paying for them.

(c) **Charityware/careware**: This is normally shareware that requires payment to be directed towards a sponsored charitable organization.

(d) **Public domain**: Here, the author totally renounces all his rights in favour of the public domain, and this needs to be explicitly stated in the program otherwise, the program will be deemed proprietary and nothing can be done with it. In this case, if additionally source code is provided, the program is free.

(e) **Copyleft**: This is a particular case of free software where the license requires for any distributed modifications to also be free.

The two major motivations for free software development are;

(1) Free software foundation ([http://www.fsf.org](http://www.fsf.org)) argues that software is knowledge that should be shared unimpeded and the ability to modify programs is a form of freedom of expression and;

(2) Open source initiative ([http://www.opensource.org](http://www.opensource.org)) which supports the use of the term ‘open source’ and argues the case of the technical and financial.

The most popular of free software licenses include the GNU General Public License, the GNU Lesser General Public License, the BSD License, the Mozilla Public License, the MIT License, and Apache License.

**Open source initiative (OSI)** is a non-profit corporation formed to educate about and advocate for the benefits of open source and to build bridges among different constituencies in the open-source community. OSI define the privileges and restrictions a licensor must follow in order to use, modify or redistribute the open source software. OSI dictates that in order to be considered “OSI certified” a product must meet the following criteria;

1) The author or holder of the license of the source code cannot collect royalties on the distribution of the program.

2) The distributed program must make the source code accessible to the user.
3) The author must allow modifications and derivations of the work under the program’s original name.
4) No person, group or field of endeavor can be denied access to the program
5) The rights attached to the program must not depend on the program’s being part of a particular software distribution.
6) The licensed software cannot place restrictions on other software that is distributed with it.

**GNU public license**

The GNU public license is a free, copyleft license for software and other kinds of works. It was originally written by Richard Stallman for GNU project a free software mass collaboration project. The GNU project released the free operating system called ‘Linux’

**SOCIAL COMPUTING**

Social computing is the use of computers and digital devices such as smart phones to allow two or more people to interact and collaborate via the internet. These are variously referred to as ‘Web 2.0, online communication, etc’. Elements of social computing include blog, wikis, Twitter, peer-to-peer networks, photo and video networking, online business networks, social networking, etc.

**Blog**

Blogs are the most visible of the social computing initiatives. They may be in the form of online journals, which may regularly be published by an individual or a small group through the web interface, and focused either on a single topic or a variety of topics reflecting interest of the authors. Entries are commonly displayed in reverse chronological order.

Many blogs provide commentary or news on a particular subject; others function as more personal online diaries. a typical blog combines text, images, and links to other blogs, web pages and other media related to its topic. The ability of readers to leave comments in an interactive format is an important part of many blogs. Most blogs are primarily textual, although some focus on art, photograph, videos, music and audio

The activity of uploading a blog is called ‘blogging’ and someone who keeps a blog is a ‘blogger’. Important blogs are blogger.com offered by Google, TypePad, journalhub.com, wordpress.com, etc.

The features that make blogs different from other websites are;

- Content is published in chronological fashion, newest on top. Often the articles are organized into categories.
- Content is updated regularly
- Readers have the possibility to leave comments
- Other authors can interact via trackbacks and pingbacks
- One or more ‘feeds’ like RSS, Atom or RDF files.
Wikipedia

Wikipedia is a online open source encyclopedia created and maintained by general users. The word ‘wikipedia’ derived by combining Hawaiian word ‘wiki’ which means ‘quick’ and encyclopedia. An important criticism of Wikipedia is its inconsistent submission model. Wikipedia allows anyone to edit its pages, even anonymously. To address this issue and to ensure quality, accurate content, all submissions and edits are moderated and regulated by a staff of regular volunteers. However, all information learned from Wikipedia should be independently verified by interested parties, and citing Wikipedia as a reference work is usually frowned upon in most academic circles.

Pear to Pear (P2P) networks

Pear to Pear networks is widely associated with sharing of music and movies. It includes file sharing networks like Napster, Kazaa, Bit Torrent, eDonkey, Skype, Gnutella, YouTube, etc. Flickr is a popular easy to use photo sharing service that was acquired by Yahoo allowing users to easily upload, tag and share photos is also a P2P network.

SOCIAL NETWORKING SITES

Social networking is defined as grouping of individuals together into specific groups like a small community or neighborhood. Although social networking is possible in person, especially in the workplace, universities, colleges, schools, it is most popular in online. This is because unlike most schools, colleges, or workplaces the internet is filled with millions of individuals who are looking to meet other people, to gather and share first hand information and experiences, developing friendships or professional alliances, finding employment, business-to-business marketing and so on. The topics and interests are as varied and rich as the story of our world. When social networking is done online, websites are used. These websites are called social networking websites.

Social networking often involves grouping specific individuals or organizations together. The internet community can be divided into five types: communities of interest, communities of relation, communities of fantasy, communities of transaction, and communities of professionals.

Social networking sites carry a profile page where a person is possible to upload biodata about him/her. The visibility of a profile varies by site and is according to user discretion. The members are free to look into it and make contact with them. There are a number of social networking websites. They typically have an open membership. That is, anyone can become a member, no matter what their hobbies, beliefs or views are. In all social networking sites anyone with a valid e-mail address are free to become a member.
The most popular social networking sites are *Facebook, MySpace, FriendFinder, Yahoo360, Orkut, Friendster, Google Buzz, Flickr, Classmates, Netlog and Geocities*.

**Benefits of social networking sites**

1. Social networking sites help the people to interact with each other.
2. They make good opportunities to find a job.
3. They are the perfect spot to meet new people who have the same interests and passions.
4. They help to promote the business. e.g. Twitter
5. They help to stay in touch with contacts.
6. These sites act as a platform to meet long lost friend and batch mates.

**Potential hazards of social networking sites**

1. Security: The social networking sites display personal information such as name, location and email address. But there are some people who reveal their fake identity and use the information for illegal activities. Therefore, it is always advisable to avoid in providing the entire information online.
2. Scams: There are a number of scammers on social networks who may try to steal or use personal information of others; information that can be used for potential crime such as identity theft or fraud.
3. Breach: It is possible for hackers to intrude into profile through client interface and to steal the information to use for illegal purposes.
4. Fraud: Social networking is based in relationships of trust. Unfortunately, about 25% of the users accept friend requests from total strangers and it may be a fraud.
MODULE II

CREATION AND MANIPULATION OF DOCUMENTS

Introduction to MS Word

MS Office is a group of software which consists of a word processor (MS Word), a spreadsheet (MS Excel), presentation software (MS PowerPoint), a database (MS Access) and some other software. New version of MS Word helps us to produce professional looking documents by providing a comprehensive set of tools for creating and formatting the document in a new interface. The traditional menus and toolbars have been replaced by the Ribbon.

The Ribbon: Ribbon is a new device that presents commands organized into a set of tabs. The tabs on the Ribbon display the commands that are most relevant for each of the task areas in the applications. For example in MS Word 2007, the tabs group commands for activities such as Inserting objects like pictures and tables, doing page layout, working with references, doing mailings, reviewing and viewing.

Title bar, Main menu, Tool bar and Quick access bar and Status bar are other facilities associated with MS Word.

The Title Bar/Header Bar

The Title Bar is located at the very top of the screen. On the Title bar, Microsoft Word displays the name of the document on which you are currently working. At the top of the screen, you should see “Microsoft Word-Document1” or the name that you have given. The right most ‘X’ mark is used to exit the word and the other two adjacent switches are for maximizing and minimizing windows.

MS Office Button

At the left top of the screen you can see the MS office button which permit the user to open, save or print, and to see everything else you can do with your document.

Toolbars

Toolbars contains various symbols for doing different activities such as bold, italic, underline, strikethrough, superscript, subscript, change case, etc.

Quick Access Tool bar

This tool bar contains symbols for doing commands which are very relevant for the user such as save, undo typing, repeat typing, open the document, print preview, etc.

MS WORD is a word processor. A word processor is a software package that enables you to create, edit, print and save documents for future retrieval and reference. The major features of a word processor are;
Word processor helps to create a document, edit and change its format.
Words and sentences can be inserted, changed or deleted.
Copying/moving of the text
Formatting can be changed
Margins and page length can be adjusted.
Spell check
Multiple documents/files can be merge

Starting MS Word

We can open MS Word from various options.

- From Microsoft Windows applications, select Microsoft MS Word, click start – Programs - MS Word
- Double click the MS Word icon from the desktop
  Then a word document will be opened.

Manipulation of the document

While creating a document we can insert a new blank document or insert a Template. Templates are pre-designed form of a document. If we want to create a document that reuses text, formatting and other setting use a template. We can design the document, we can insert a cover page, blank page or page break in the document. The facility to insert Charts, pictures, different shapes, smart art forms, word art forms, various forms of equations and symbols are available in MS Word.

The ‘Home’ menu helps the user to change the font, select the font size, make the selected font bold, italicize, underline, change the text color, and thus to format the text.

The ‘insert’ menu helps the user to insert a cover page, blank page or page break in the document, to insert a table, picture, clip art, smart art, chart, page number, equation, symbol, etc.

The Page Layout menu helps the user to change the margin sizes, Orientation (switch the pages between portrait and landscape layouts), to choose a paper size, to split text into two or more columns, to choose a background color of a page, to add or change the border around the page, etc.

Mail Merge:

Mail Merge is a facility to send a document to different recipients. For this purpose a master file and a data file has to be created. Master file contains the content of the document and the data file contains the addresses of the recipients.
The general procedure followed for this facility is;

- From the main menu select ‘**Start Mail Merge**’
- Create a main/master document
- **Select recipients** - Here we can type new address list or use existing list
- **Insert Merge Field** towards the space for entering recipients address
- Finish Merge - Here we can direct the merged document either to edit individual documents or print the merged document or send email messages.
DATA ANALYSIS

Working with MS Excel

Microsoft Office Excel provides powerful tools and features that a user can use to analyze, share and manage data with ease. As a spreadsheet it is widely used for data analysis. A spreadsheet is a large sheet of paper which contains rows and columns. The intersection of rows and columns is termed as a ‘cell’. To enable us to explore massive amounts of data in worksheets, MS Excel 2007 version supports up to 1 million rows and 16 thousand columns per worksheet. MS Excel is used to prepare databases, to make charts and diagrams and for doing various mathematical and statistical operations. It is to be noted that any mathematical operation should begin with the sign ‘=’ or ‘+’ under Excel.

Starting Excel

We can start Excel from various options.

- From Microsoft Windows applications, select Microsoft Excel, click start – Programs - Microsoft Excel
- Double click the MS Excel icon from the desktop

Work Books

A file in Microsoft Excel is called a work book. A work book is organized in various worksheets. Thus a work book is a collection of work sheet used in a single file.

Worksheet

A worksheet is a table like document containing rows and columns with data and formula. When MS Excel is opened, it starts with three worksheets. MS Excel can handle with the following calculation and logical operators.

Calculation operators

Operators specify the type of calculation that we want to perform on the elements of a formula. There are four different types of calculation operators are used. They are: arithmetic, comparison, text concatenation (link together) and reference.

Arithmetic operators

<table>
<thead>
<tr>
<th>Arithmatic operator</th>
<th>Meaning (example)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Addition (2+3)</td>
</tr>
<tr>
<td>-</td>
<td>Subtraction (3-2)</td>
</tr>
<tr>
<td>*</td>
<td>Multiplication (3*2)</td>
</tr>
<tr>
<td>/</td>
<td>Division (3/2)</td>
</tr>
<tr>
<td>^</td>
<td>Exponentiation (3^2)</td>
</tr>
<tr>
<td>%</td>
<td>Percent (20%)</td>
</tr>
</tbody>
</table>
Comparison operators

We can compare two values with the following operators. When two values are compared by using these operators, the result is a logical value either TRUE or FALSE.

<table>
<thead>
<tr>
<th>Comparison operator</th>
<th>Meaning (example)</th>
</tr>
</thead>
<tbody>
<tr>
<td>=</td>
<td>(equal sign) equal to (A1=B1)</td>
</tr>
<tr>
<td>&gt;</td>
<td>(greater than sign) greater than (A1&gt;B1)</td>
</tr>
<tr>
<td>&lt;</td>
<td>(less than sign) less than (A1&lt;B1)</td>
</tr>
<tr>
<td>&gt;=</td>
<td>(greater than or equal to sign) greater than or equal to (A1&gt;=B1)</td>
</tr>
<tr>
<td>&lt;=</td>
<td>(less than or equal to sign) less than or equal to (A1&lt;=B1)</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>(not equal to sign) not equal to (A1&lt;&gt;B1)</td>
</tr>
</tbody>
</table>

Text concatenation operator

Use the ampersand (&) to join, or concatenate, one or more text strings to produce a single piece of text.

Example:- (A1&B1)

Reference operators

Combine ranges of cells for calculations with the following operators

<table>
<thead>
<tr>
<th>(colon)</th>
<th>Range operator, which produces one reference to all the cells between two references, including the two references (B5:B15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(comma)</td>
<td>Union operator, which combines multiple references (sum(B5:B15,D5:D15))</td>
</tr>
<tr>
<td>(space)</td>
<td>Intersection operator, which produces one reference to cells common to the two references (B5:B15 D5:D15)</td>
</tr>
</tbody>
</table>

To create a formula

- \(=5*2+3\)
- \(=5*(2+3)\)

To create formula with functions

- \(=\text{SUM}(A1:A10)\) adds the numbers from A1 to A10
- \(=\text{AVERAGE}(B1:B10)\) averages all numbers in the range B1 to B10
- \(=\text{LOG}(10)\) logarithm of 10
Logical operations

Condition ‘IF’

“IF” command is used to check whether a condition is met and returns one value if TRUE and another value if FALSE

example: \[ =IF(A1>1.4,\text{"PASSED"},\text{"FAILED"}) \]

If the value of A1 is greater than 1.4 it will display as “PASSED” or display as “FAILED”.

MS Excel is also widely used to create various types of diagrams and graphs such as bar diagrams, pie diagram, line chart, area chart, etc.

Excel tool bars

The major tool bars in MS Excel are The micro soft office button, the ribbon, the title bar, quick access tool bar, the cell address bar, formula bar and scroll bar. These tool bars helps for better editing and modification of the worksheet.

Application of MS Excel in Economics

MS Excel has wide applications in Economics. Economics is a social science which deals with human wants and their satisfaction. The theories of economics like producer’s behavior and consumer’s behavior can be better explained with the help of computer software especially with MS Excel. For example, the theory of law of demand states the inverse relationship between the price of the commodity and quantity demanded.

MS Excel can be effectively used to state the law of demand. After stating the law a demand schedule and the demand curve can be inserted as cited below.

The Law of Demand

The law of demand states that “other things remains the same, there is inverse relationship between the price of the commodity and quantity demanded”. That is when the price increases the quantity demanded falls and when the price falls the quantity demanded increases. This is shown in the following demand schedule and the demand curve.

Demand Schedule

<table>
<thead>
<tr>
<th>Price of the commodity</th>
<th>Quantity demanded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>
The above demand schedule and demand curve are drawn by using the excel facility. Similarly, MS Excel provides facility to do mathematical and statistical operations. By using these facilities various calculations can be done. Different types of charts can also be used for better explaining the concepts and laws of economics.
MODULE IV
DATABASE MANAGEMENT

We are familiar with the term data. Data refers to the information which can be presented in systematic and attractive form. The details of a person, price of a commodity, number of students in an institution, etc. are examples of data.

It is easier to remember all information for a few individuals. For example, we are in a position to remember accurately the age, height, income, educational qualification, etc. of our close friends. But it is too difficult for us to memorize all these information for a large number of individuals. To deal with such problems we construct a database. Database is a collection of information in a structured way in a tabular form or it is a collection of a group of facts. Database involves centralized storage for effective retrieval of data. When the database contains huge data, the manual query becomes difficult. For example, bank’s database contains thousands of customer’s details. In such cases the manual system of query about a transaction becomes difficult. Therefore banks use computer databases.

A computer database holds information in Tables which contains Records comprised of Fields.

- A table is a collection of data about similar items placed in rows and columns.
- A record is the data pertaining to one particular item.
- A field is one specific piece of information about a record.

DATABASE MANAGEMENT SYSTEM

A database management system (DBMS) is a collection of interrelated data and a set of programs to access those data. The primary goal of a DBMS is to provide a way to store and retrieve database information that is both convenient and efficient. Thus, Database Management System (DBMS) is a software system that enables users to define, create, store, modify, maintain and extract information from a database and provides controlled access to this database. It is designed to manage a large body of information.

Database systems versus File systems

Consider a savings-bank enterprise keeps information about all customers and saving accounts. One way to keep the information on a computer is to store it in operating system files. To allow users to manipulate the information, the system has a number of application programs that manipulate the files, including

- a program to debit or credit an account
- a program to add a new account
- a program to find the balance of an account
• a program to generate monthly statements.

System programmers wrote these application programs to meet the needs of the bank.

Now application programs are added to the system as the need arises. For example, suppose that the saving bank decides to offer checking accounts. As a result the bank creates new permanent files that contain information about all the checking accounts maintained in the bank, and it may have to write new application programs to deal with situations that do not arise in saving accounts, such as overdrafts. Thus as time goes by, the system acquires more files and more application programs.

This typical file processing system is supported by a conventional operating system. The system stores permanent records in various files, and it needs different application programs to extract records from, and add records to the appropriate files. Before database management system came along organizations usually stored information in such systems.

Keeping organizational information in a file processing system has a number of disadvantages.

- **Data redundancy and inconsistency**: Since different programmers create the files and application programs over a long period, the various files are likely to have different formats and the programs may be written in several programming languages. Moreover, the same information may be duplicated in several places/files. For example, the address and telephone number of a particular customer may appear in file that consist of savings-account records and in a file that consist of checking account records. This redundancy leads to higher storage and access cost. Moreover it may leads to data inconsistency, i.e. the various copies of the same data may no longer agree. For example, a changed customer address may be reflected in savings account records but no elsewhere in the system.

- **Difficulty in accessing data**: Suppose that one of the bank officers needs to find out the names of all customers who live within a particular postal code are. The officer asks the data processing department to generate such a list. Because the designers of the original system did not anticipate such a request, there is no application program on hand to meet it. There is, however, an application program to generate the list of all customers. The bank officer has now two choices: either obtain the list of all customers and extract the needed information manually or ask a system programmer to write the necessary application program. Both alternatives are obviously unsatisfactory. To solve such problems more responsive data retrieval systems are required for general use.

- **Data isolation**: Because data are scattered in various files, and files may be in different formats, writing new application programs to retrieve the appropriate data is difficult.

- **Integrity problems**: The data values stored in the database must satisfy certain types of consistency constraints. For example, the balance of a bank account may never fall below a prescribed amount (say $ 25) Developers enforce these constraints in the system by adding appropriate code in the various application programs. However, when new constraints are
added, it is difficult to change the programs to enforce them. The problem is compounded when constraints involve several data items from different files.

- **Atomicity problems**: A computer system like any other mechanical or electrical device, is subject to failure. In many applications, it is crucial that, if a failure occurs, the data be restored to the consistent state that existed prior to the failure. Consider a program to transfer $50 from account A to account B. If a system failure occurs during the execution of the program, it is possible that the $50 has removed from the account A but not credited to the account B, resulting in an inconsistent database state. Clearly, it is essential to database consistency that either both the credit and debit occur, or that neither occur. That is, the funds transfer must be atomic—it must happen in its entirety or not at all. It is difficult to ensure atomicity in a conventional file processing system.

- **Concurrent access anomalies**: For the sake of overall performance of the system and faster response, many systems allow multiple users to update the data simultaneously. In such an environment, interaction of concurrent updates may result in inconsistent data. Consider the bank account contain $500. If two customers withdraw funds (say $50 and $100 respectively) from account A at about the same time, the result of the concurrent execution may leave the account in an incorrect (or inconsistent) state. Suppose that the programs executing on behalf of each withdrawal read the old balance, reduce that value by the amount being withdrawn, and write the result back. If the two programs run concurrently, they may both read the value $500 and write back $450 and $400 respectively. Depending on which one writes the value last, the account may contain either $450 or $400, rather than the correct value of $350. To guard against this possibility, the system must maintain some form of supervision. But supervision is difficult to provide because data may be accessed by many different application programs that have not been coordinated previously.

- **Security problem**: Every user of the database system should not be able to access all data. For example, in a banking system, payroll personnel need to see only that part of the database that has information about customer accounts. But, since the application programs are added to the system in an ad hoc manner, enforcing such security constraints is difficult.

These difficulties are necessitated for the development of database system.

**Models of DBMS**

There are different/five models of DBMS, which are distinguished based on how they represent the data contained.

1) **The Entry-Relationship Model**: The Entry-Relationship (E-R) data model is based on a perception of a real world that consists of a collection of basic objects, called entities, and of relationships among these objects. An entity is a ‘thing’ or ‘object’ in the real world that is distinguishable from other objects. For example, each person is an entity, and bank accounts can be considered as entities. Entities are described in a database by a set of attributes. For example, the attributes account number and balance may describe one
particular account in a bank, and they form attributes of the *account entity* set. Similarly, attributes *customer-name*, *customer street* address and *customer city* may describe a *customer entity*.

An extra attribute *customer-id* is used to uniquely identify customers (since it may be possible to have two customers with the same name, street address and city). A unique customer identifier must be assigned to each customer. In the United States many enterprises use the social security number of a person (a unique number the US government assigns to every person in the United States) as a customer identifier.

A *relationship* is an association among several entities. For example, a depositor relationship associates a customer with each account that she has. The set of all entities of the same type and the set of all entities of the same type and the set of all relationships of the same type are termed an *entity set* and *relationship set* respectively.

The overall logical structure of a database can be expressed graphically by an E-R diagram, which is built up from the following components.

- Rectangles – which represent entity set
- Ellipses – which represent attributes
- Diamonds – which represent relationships among entity sets
- Lines – which link attributes to entity sets and entity sets to relationships

![A simple E-R diagram](image)

2) **Relational Model**: The relational model uses a collection of tables to represent both data and the relationships among those data. Each table has multiple columns and each column has a unique name. It is the most widely used data model, and a vast majority of current database systems are based on the relational model. eg:-

<table>
<thead>
<tr>
<th>Account number</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-101</td>
<td>500</td>
</tr>
<tr>
<td>A-215</td>
<td>700</td>
</tr>
<tr>
<td>A-102</td>
<td>400</td>
</tr>
<tr>
<td>A-305</td>
<td>350</td>
</tr>
<tr>
<td>A-201</td>
<td>900</td>
</tr>
</tbody>
</table>
3) **The Hierarchical Modes**: The data is stored hierarchically, using a downward tree. It was the first DBMS model. This model uses pointers to navigate between stored data.

4) **The Network Model**: Like the hierarchical model, this model uses pointers towards stored data. However, it does not necessarily use a downward tree structure.

5) **The deductive model**: Data is represented as a table, but is manipulated using predicate calculus.

6) **The object oriented data model** (DBMS-object-oriented database management system): As database systems were applied to a wider range of applications like computer-aided design, limitations imposed by the relational model emerged as obstacles. As a result, database researchers invented new data models that overcome the relational models restrictions. The object oriented model is based on the object oriented programming paradigm. The data is stored in the form of objects. An object corresponds to an entity in the E-R model. The object oriented paradigm is based on encapsulation of data and code related to an object into a single unit, whose contents are not visible to the outside world. Conceptually all interactions between an object and the rest of the system are via messages. The languages C++ and Java are the most widely used object-oriented programming languages.

**MAIN FUNCTIONS OF DBMS**

The main functions of databases are;

→ **Update and retrieve data**: A DBMS must provide users with the ability to update and retrieve data in database.

→ **Provide catalogue services**: A DBMS must store data about the data in a database and make this data accessible to users.

→ **Support concurrent update**: A DBMS must ensure that the database is updated correctly when multiple users update at the same time.
→ **Recover data**: A DBMS must provide methods to recover a database in the event the database is damaged in anyway.

→ **Provide security services**: A DBMS must provide ways to ensure that only authorized users can access the database.

→ **Provide data integrity features**: A DBMS must follow rules so that it updates data accurately and consistently.

→ **Support data independence**: A DBMS must provide facilities to support the independence of programs from the structure of a database.

→ **Support data replication**: A DBMS must manage multiple copies of the same data at multiple locations.

→ **Provide utility services**: A DBMS must provide services that assist in the general maintenance of a database.

Examples for database management systems are Microsoft Access, MySQL, Oracle, Microsoft FoxPro, Microsoft SQL Server, Interbase, IBM DB2, Sybase, etc.

**MICROSOFT ACCESS**

Microsoft Access is a database management package. In this package data are presented in the form of table. A table is a database object that we store data about a particular subject such as employees or products. Each **record** contains data about one instance of the table subject such as particular employee or student, etc. A record is commonly called as a **row**. Each **field** contains data about one aspect of the table subject. A **field** is commonly called as a column or an **attribute**. A record consists of field values such as name, date of birth, etc.

**Keys**: Fields that are part of a table relationship are called Keys. A key usually consist of one field, but it may consist of more than one field.

**Primary Key**

A table can have only one primary key. A primary key consists of one or more fields that uniquely identify each record that we store in the table. Often there is a unique identification number, such as an ID number, serial number, or a code that serves as a primary key. We can assign a field as a primary key or the computer itself assigns the first field as a primary key.

In the Microsoft Access there is facility to create **forms**, handling with **queries** and generating **reports**. Forms provide a user friendly visual way to enter and present data. Forms take their data from a table or a query.
A **Query** is a request for data results, for action on data, or for both. We can use queries to answer a simple question, to perform calculations, to combine data from different tables, or even to add, change, or delete table data. Queries that we use to retrieve data from a table or to make calculations are called select queries. Queries that add change or delete data are called action queries.

**Reports** provide a means of organizing and summarizing data. Reports are often used to present an overview highlighting main points and trends. A report can be a simple list, a status report or a monthly production report. With reports one can prepare mailing labels for various producers, produce a directory, prepare invoices and prepare data summaries.

**APPLICATIONS OF DATABASE MANAGEMENT SYSTEM**

A database management system is designed to manage a large body of information. It involves both defining structures for storing information and providing mechanism for manipulating them. It also provide for the safety of the stored information. Major application of database management system includes:

- **Airline reservation system** – Reservation by a single customer on a single flight, information about flights, information about ticket prices, requirements and availability.
- **Corporate records** – To handle corporate records such as record of each sale, information about accounts payable, and receivable, information about employees, etc.
- **Banking systems** – To handle information about customers, their accounts, loans and balances, etc.

**PowerPoint**

PowerPoint is a presentation software. There is a new look for new versions of PowerPoint, a new user interface that replaces menus, toolbars, and most of the task panes from previous versions of PowerPoint with a single mechanism that is simple and discoverable.

**Ribbon user interface**

The primary replacement for menus and toolbars in Office PowerPoint 2007 is the Ribbon designed for easy browsing. The tabs on the Ribbon display the commands that are most relevant for each of the task areas in the application. For example, in Office PowerPoint 2007 the tabs group commands for activities such as inserting objects like slide, pictures and tables, designing the slides, giving animation effects to the slides, slide show, reviewing and viewing.

**Menus, toolbars and other familiar elements**

In addition to tabs, groups and commands, Office PowerPoint 2007 uses other elements that also provide paths for accomplishing your tasks. The following elements are
more like the menus and toolbars that you are already familiar with from previous versions of PowerPoint.

**Microsoft Office Button**

This button is located at the upper-left corner of the PowerPoint window and opens the menu which shows the commands new, open, save, save as, print, prepare, publish, etc.

**Quick Access Toolbar**

The Quick Access Toolbar is located by default at the top of the PowerPoint window and provides quick access to tools that you use frequently. You can customize the Quick Access Toolbar by adding commands to it.

**STEPS FOR MAKING A PRESENTATION**

1. Getting started with the start menu
2. Select Microsoft PowerPoint and click. A new PowerPoint file will open. Then type the title and subtitle if wanted. A new slide can be inserted either by clicking the icon ‘new slide’ or by using the short-cut key ‘ctrl+M’.
3. Type the content. You can insert the table, chart, pictures, movies, sounds, etc. with the content.

   You can design the slides by using the tab ‘Design’. Different models are available within the system. So you can choose appropriate design. You can select a common design for all slides or separate designs for each slide.

   Animation effect can be given to the slides. You can choose an animation to apply to objects in the slide by selecting the Animation tool. Custom Animation tool open the custom animation task pane so that you can animate the individual objects on the slide. Custom Animation provides ‘Add Effects’ to the objects on the slide. There are five options to provide add effects – Entrance, Emphasis, Exit, and Motion path. That is, providing add effects during the entrance of the objects, giving emphasis to the objects, effects during exit and directing the path of the movement. From the command ‘Slide show’ you can run the slide show either starting from the first slide itself or starting from the current slide.
MODULE-V

PREPARATION AND PRESENTATION


1. INTRODUCTION TO POWERPOINT

Definition 1:

PowerPoint is Microsoft's presentation software that enables users to create engaging presentations that consist of individual pages, or slides, which may contain text, graphics, sound, movies, hyperlinks, and other objects. PowerPoint enables users to add animation and effects to slideshow elements. Presentations can be printed, displayed, notated, and navigated by the presenter.

Definition 2:

Microsoft PowerPoint is a software product used to perform computer-based presentations. There are various circumstances in which a presentation is made: teaching a class, introducing a product to sell, explaining an organizational structure, etc.

Definition 3:

PowerPoint is a presentation software program that is part of the Microsoft Office package. PowerPoint uses a graphical approach to presentations in the form of slide shows that accompany the oral delivery of the topic. This program is widely used in business and classrooms and is an effective tool when used for training purposes.

PowerPoint is one of the simplest computer programs to learn. It is the most popular program used worldwide for presentations. PowerPoint presentations can be made into photo albums, complete with music or narrations, to distribute on CDs or DVDs. If you are in the sales field, it involves just a few simple clicks to add an illustrative chart of data or an organizational chart of your company's structure. Make your presentation into a web page for emailing purposes or as a promotion displayed on your company's website.

Definition 4:

PowerPoint is a complete presentation graphics package. It gives you everything you need to produce a professional-looking presentation. PowerPoint offers word processing, outlining, drawing, graphing, and presentation management tools—all designed to be easy to use and learn.
The following gives a quick overview of what we can do in PowerPoint:

- When you create a presentation using PowerPoint, the presentation is made up of a series of slides. The slides that you create using PowerPoint can also be presented as overhead transparencies or 35mm slides.

- In addition to slides, you can print audience handouts, outlines, and speaker’s notes.

- You can format all the slides in a presentation using the powerful Slide Master which will be covered in the tutorial.

- You can keep your entire presentation in a single file— all your slides, speaker’s notes, and audience handouts.

- You can import what you have created in other Microsoft products, such as Word and Excel into any of your slides.

We will take a look at the PowerPoint software and analyse what it has to offer.

2. STARTING POWERPOINT

Step 1: To start PowerPoint, go to the Start menu and select Programs ->Microsoft Office ->Power Point.

Step 2: PowerPoint opens in “Normal” view. In normal view, you will see the following:

- A blank slide in the center of the window.

- Off to the left, a “Slides” pane that will display a thumbnail sketch of all the slides in your presentation, in sequence.

- Off to the right, a “Task” pane that will display the following options for getting started:

  i. “Open,” to open a pre-existing presentation.

  ii. “Create a new presentation,” to start a new presentation.

Step 3: Click “Create a new presentation” to start a new presentation.
Step 4: Click “Blank presentation” to create a presentation from scratch. Your other options here are “From design template,” “From AutoContent wizard” and “From existing presentation.”

Step 5: Click on a desired layout from the choices that appear in the task pane. A discussion of layouts follows in the next section.

3. CREATING SLIDES

Open the PowerPoint program (as described above), or, if you already have the program, from the File menu (top left of the screen), select new. A new presentation dialog box appears. Select the icon that says blank presentation and click the OK button.

A New Slide dialog box appears, showing you the choices of slide layouts. Move the pointer over each of the slide choices, clicking once on each (don't double click as this will create a slide). As you click on each slide the name of the slide format appears in the gray box on the right. Explore the different layout options that are available.

Create a title slide:

Since the first slide of a presentation is usually the title slide, start your presentation by double clicking on the title slide. A title slide will appear. The words Click to add title and click to add sub-title are shown in dotted boxes. Click on the first box and type in the name of your presentation. Then click in the next box, this time typing in your name and any other information you might want to include in the sub-title box.

Adding a new slide:

You can do this in a variety of ways:

- Click on the Insert menu and select the new slide option.
- Click on the new slide icon that appears in the tool bar.
- Select the Ctrl and M keys.

This will take you to the new slide dialog box (see above) and you can now choose the format for your next slide. Example: Title slide, bulleted slide, graph slide, 2 column text slide, text and clip art slide.
4. THE AUTOCONTENT WIZARD

PowerPoint has an AutoContent Wizard to help you create a presentation. This wizard provides several slides with different content guides. Presentation guides are available in several areas including General, Corporate, and Sales/Marketing.

![AutoContent Wizard](image)

Presentations created with the AutoContent Wizard include suggestions on where to put different kinds of information and how to organize it into an effective presentation format.

**Use AutoContent Wizard**

1. Open PowerPoint.
2. Click on from AutoContent Wizard in the Task Pane.
   - if the Task Pane is not visible, click on View from the menubar and then click on Task Pane.
3. Follow the instructions in the wizard and make your choices or provide information when asked.
4. When the wizard is completed - finish the presentation by filling in the slides with text and images.
5. WORKING WITH TEXTS

Adding a Textbox in PowerPoint

When adding text to their PowerPoint presentations, many people limit themselves to using only the placeholder boxes that are present by default when you add a new slide. For example, when you add a title and content slide, there is always a title placeholder in which you will see the words “Click to add title” and a content placeholder that displays the words “Click to add text”. It is then a simple case of clicking into each of those boxes and then typing your content.

However, another way of adding text that gives you more flexibility over positioning is to add a textbox. Click Insert > Text > Text Box, and the cursor will change to this shape:

Left click with the mouse and drag out the textbox. Once the text box has been drawn, you can start typing in it. When you drag out your initial text box, it retains its width, but the height contracts temporarily to be the height of one line of text. When you type multiple lines, the height will adjust to fit, but the width of the textbox will remain fixed.

Format text in PowerPoint

Most of the time, you will probably leave the text you type in your PowerPoint presentation as it is, without formatting it. However, sometimes you might like to style certain pieces of text so that it stands out.

To format some text, first of all select it. As you move the cursor, the mini toolbar appears as if by magic. The mini toolbar contains some of the more commonly used formatting commands that PowerPoint guesses you are likely to use. Using it, you can bold text, italicize it and do various other text formatting tasks, all at the click of a button. You will probably be familiar with all of the commands available on the mini toolbar, so we won't dwell on them.

6. WORKING WITH GRAPHS

When presenting research papers in PowerPoint, it is sometimes helpful to insert a graph or diagram prepared in another format.
Creating Charts

1. Select the slide where you want the chart to appear.

2. In the Insert tab, under the Illustrations group, click on CHART to open the Insert Chart dialog.

3. Select the type of chart from the category list on the left, or simply scroll through the gallery on the right to view all the available charts. Once you have made your selection, click OK.

4. The chart will appear on your slide, and Excel will open as a split screen with dummy data already filled in.

5. Add your data and labels to the Excel spreadsheet and the chart will be automatically updated on your slide.

6. When finished, click the X in the upper right hand corner of Excel to close the worksheet.

Changing To a Different Chart

PowerPoint makes it easy to change the type of chart you are using without needing to start over and re-add all your data. You can make this change even after you have applied formatting (see below).

1. Right-click on the chart you would like to change and select Change Series Chart Type... to bring up the Change Chart Type dialog.

2. Make a selection and press OK.

Updating a chart

After creating a chart you may want to update, add, or delete information.
Updating a chart: Changing Values

1. Click on the chart to select it.

3. In the Design tab under the Data group click on EDIT DATA. Excel will open in a split screen with your chart's data.
4. Change your data. Your chart will be updated automatically when you press [Enter] or click outside of the cell.
5. When finished, click the in the upper right hand corner of Excel to close the worksheet.

Updating a chart: Adding Data

1. Click on the chart to select it.

3. In the Design tab under the Data group click on EDIT DATA. Excel will open in a split screen with your chart's data.
4. If needed, drag the lower right hand corner of the data range to add rows or columns. Type the new data in the appropriate location. If you add the data to a new table or row, the data will automatically be added to the appropriate place on your chart.
5. To update the chart on your slide, press [Enter] or click outside of the cell where you've added data.
6. When finished, click the in the upper right hand corner of Excel to close the worksheet.

Updating a chart: Deleting Data

1. Click on the chart to select it.

3. In the Design tab under the Data group click on EDIT DATA. Excel will open in a split screen with your chart's data.
4. In the Excel worksheet, select the individual values you would like to delete, or click on the row or column identifier to select an entire row or column.
5. Press [Delete]. The chart is updated on the slide.
6. When finished, click the in the upper right hand corner of Excel to close the worksheet.
Customizing a Chart

When you add a chart to your slide, PowerPoint chooses the formatting based on the theme of your slide. All of the elements of your chart can be customized, however, either by using another preset or by modifying the elements individually.

Customizing a Chart: Pre-set Formats & Styles

For a quick way to change the look of your chart without having to change every individual element, PowerPoint provides a number of layouts and color schemes for each chart.

1. Click on the chart to select it.
3. To change the layout of your chart, in the Design tab under the Chart Layouts group, scroll through the layout gallery and select a new layout to apply it to your chart.
4. To change the style of your chart, in the Design tab under the Chart Styles group, scroll through the style gallery and select a new style to apply it to your chart.

7. WORKING WITH PICTURE OR CLIP ART

You can insert or copy pictures and clip art into a PowerPoint presentation from sources such as clip art Web site providers, Web pages, or files on your computer. You can use pictures and clip art as backgrounds for your slides in PowerPoint.

(a) Insert clip art

Do the following for all programs listed in the Applies To at the top of the article.

1. On the Insert tab, in the Illustrations group, click Clip Art.

2. In the Clip Art task pane, in the Search for text box, type a word or phrase that describes the clip art that you want, or type all or some of the file name of the clip art.
3. To narrow your search, do one or both of the following:
To limit the search results to a specific collection of clip art, in the **Search in** list, select the check box next to each collection that you want to search.

To limit the search results to clip art, in the **Results should be** list, select the **Clip Art** check box. You can also select the check boxes next to **Photographs**, **Movies**, and **Sounds** to search those media types.

4. Click **Go**.

5. In the list of results, click the clip art to insert it.

(b) Insert a picture from a file

Do the following for all programs listed in the **Applies To** at the top of the article.

1. Click where you want to insert the picture.
2. On the **Insert** tab, in the **Illustrations** group, click **Picture**.

3. Locate the picture that you want to insert, and then double-click it.

To add multiple pictures, press and hold **CTRL** while you click the pictures that you want to insert, and then click **Insert**.

**8. INSERT A SOUND INTO A POWERPOINT PRESENTATION**

You can add sound files to your presentations from a variety of sources. For example, you can add sound files you download from the Internet or special sound effects CDs. However, PowerPoint does not recognize all sound file types. WAV and MIDI are two of the types it does recognize. PowerPoint also lets you attach sounds to different objects on a slide. However, the objects must be animated before you can attach a sound file to them. See section on animation for more details.

To prevent possible problems with links, it is a good idea to copy the sounds into the same folder as your presentation before you add the sounds to your presentation.

1. In the pane that contains the Outline and Slides tabs, click the **Slides** tab.
2. Click the slide to which you want to add a sound.
3. On the **Insert** tab, in the **Media Clips** group, click the arrow under **Sound**.
4. Do one of the following:

* Click **Sound from File**, locate the folder that contains the file, and then double-click the file that you want to add.

* Click **Sound from Clip Organizer**, scroll to find the clip that you want in the **Clip Art** task pane, and then click it to add it to the slide.

9. **INSERT A VIDEO INTO A POWERPOINT PRESENTATION (Embed or link to a video)**

You can insert one or more video clips — that is, movies — into any slide. You might want to play a video quote from your product manager, for example, or run a short documentary movie for a fund-raising event. You could even create a video for product tutorials and educational materials.

Most of the movie clips stored in the Clip Organizer are simply animated .gif files, small files that contain an animated sequence of images. If you imported your own movie files into the Clip Organizer, you will find them there, too, generally stored in .avi format. You might be able to find additional movie clips on your network, intranet, or the Internet.

You can embed a video or link to a video from your PowerPoint presentation. If you want to limit the size of your presentation, you can link to a video file on your local drive or to a video file that you uploaded to a web site, such as YouTube or hulu.

All options to insert a video are located on the **Insert** tab, in the **Media** group.

PowerPoint will support QuickTime (.mov, .mp4) and Adobe Flash (.swf) files when you have installed the QuickTime and Adobe Flash players.

There are some limitations when using Flash in PowerPoint 2010, including the inability to use special effects (such as shadows, reflections, glow effects, soft edges, bevels, and 3-D rotation), the fade and trim capabilities, and the ability to compress these files for easier sharing and distribution.

**Embed a video from a file**

1. In **Normal** view, click the slide in which you want to embed a video.

2. On the **Insert** tab, in the **Media** group, click the arrow under **Video**, and then click **Video from file**.
3. In the **Insert Video** dialog box, locate and click the video that you want to embed, and then click **Insert**.

You can also click the **Video** icon in a content layout to insert a video.

![Insert Video dialog box](image)

### 10. DESIGN TEMPLATES

A Microsoft Office PowerPoint 2007 template is a pattern or blueprint of a slide or group of slides that you save as a .potx file. Templates can contain layouts, theme colors, theme fonts, theme effects, background styles, and even content.

You can create your own custom templates and store them, reuse them, and share them with others. You can also find hundreds of different types of free templates on Office Online and on other partner Web sites that you can apply to your presentation. See the demo at the end of this article for a walk-through on how to download and apply a template from Office Online.

Some examples of templates on Office Online are given in the following table:

<table>
<thead>
<tr>
<th>Agendas</th>
<th>Award certificates</th>
<th>Brochures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgets</td>
<td>Business cards</td>
<td>Calendars</td>
</tr>
<tr>
<td>Content slides</td>
<td>Contracts</td>
<td>Databases</td>
</tr>
<tr>
<td>Design slides</td>
<td>Diagrams</td>
<td>Envelopes</td>
</tr>
<tr>
<td>Expense reports</td>
<td>Fax sheets</td>
<td>Flyers</td>
</tr>
<tr>
<td>Forms</td>
<td>Gift certificates</td>
<td>Greeting cards</td>
</tr>
<tr>
<td>Inventories</td>
<td>Invitations</td>
<td>Invoices</td>
</tr>
<tr>
<td>Labels</td>
<td>Letters</td>
<td>Lists</td>
</tr>
<tr>
<td>Memos</td>
<td>Minutes</td>
<td>Newsletters</td>
</tr>
<tr>
<td>Plans</td>
<td>Planners</td>
<td>Postcards</td>
</tr>
<tr>
<td>Purchase orders</td>
<td>Receipts</td>
<td>Reports</td>
</tr>
<tr>
<td>Resumes</td>
<td>Schedules</td>
<td>Schedules</td>
</tr>
<tr>
<td>Statements</td>
<td>Stationary</td>
<td>Time sheets</td>
</tr>
</tbody>
</table>
Apply a design template

On the Formatting toolbar, click Design. (If you already have the Slide Design pane open with color schemes or animation schemes displayed, click Design Templates at the top.)

**Do one of the following:**

To apply a design template to all slides (and the slide master), click the template you want.

To apply a template to a single slide, select the thumbnail on the Slides tab; in the task pane, point to the template and click the arrow, and then click Apply to Selected Slides.

To apply a template to multiple selected slides, select the thumbnails on the Slides tab, and in the task pane, click the template.

To apply a new template to a group of slides that currently use a different template, select one of the slides on the Slides tab; in the task pane, point to the template and click the arrow, and then click Apply to Master.

*Please note: Design templates you have applied appear in the Slide Design task pane under Used in this presentation. All available design templates appear under Available for use.*

11. ANIMATING TEXT AND OBJECTS

There are two ways to animate text and objects: Preset Animation and Custom Animation. Although Preset Animation is relatively simpler, we strongly recommend Custom Animation because it allows more control over animation. The instructions below pertain to Custom Animation only.

1. Click on the slide that you wish to animate and select Slide Show < Custom Animation (You must be in Normal, Outline, or Slide View).

2. In the Custom Animation dialog box, each object is identified in the Check to animate slide objects list.

3. Click in the object's checkbox to animate that object.

12. SLIDE TRANSITIONS

Transitions determine the effects applied when you move from one slide to another during an on-screen presentation.

1. To choose a transition effect, select Slide Show < Slide Transition...

2. Select a transition effect from the drop down menu
3. Choose the desired transition speed (Fast is always recommended in order not to lose the audience's attention)

4. Choose a sound to accompany the transition (optional)

5. Advance determines when the current slide proceeds to the next.

   On mouse click advances the presentation to the next slide, or displays the next bullet point, only when you click the mouse. (You can also use the keyboard arrow keys or the spacebar.) Automatically after xx seconds, makes the transition xx seconds after the preceding transition ended.

12. PREVIEWING THE CONTENTS

   For a quick preview of a slide show while you're editing a presentation, hold down the Ctrl key while clicking on View Show in the Slide Show menu. Instead of launching in full-screen mode, the presentation, starting with the current slide, will appear in a small window atop the slide being edited. To edit the slide and see your changes in real time, resize the PowerPoint window so the preview slide is in view. Any modifications you make will instantly appear in the preview window.

   **Preview the custom animations**

   Check to make sure the **AutoPreview** box is checked.

   - When you click the **Play** button at the bottom of the **Custom Animation** task pane, this single slide will play in the current window, showing any animations applied to the slide.
   - When you click the **Slide Show** button at the bottom of the **Custom Animation** task pane, the slide show will play in full screen, starting from this current slide.
   - Choose **Slide Show > View Show** from the menu or press the **F5** key to play the complete show in full screen.

   After viewing the slide show, you can make any necessary adjustments and preview once again.

13. POWERPOINT GLOSSARY

   **Presentation**: The primary type of file PowerPoint is used to create. Presentations typically have the file extension .ppt; however, you can also save PowerPoint presentations as Adobe Acrobat documents with the file extension .pdf. Finally, you can save your presentation as a web page, with the file extension .html or .htm.

   **Slides**: Individual parts of a presentation. Slides are similar to the individual pages in a print document, and can contain text, graphics, and animation.
**Layout:** The specific arrangement of text and images on a slide. Layouts can be very simple, consisting of simple titles and text, or they can be more complex and include elaborate colors and images. You can also include animation, sounds, and other multimedia objects in your layout.

**View:** Microsoft PowerPoint has three main views: normal view, slide sorter view, and slide show view. Normal view is the main editing view. Slide sorter view is an exclusive view of your slides in thumbnail form, helpful for rearranging the order of your slides. Slide show view takes up the full computer screen, like an actual slide show presentation. In this full-screen view, you see your presentation the way your audience will.

**Design Template:** The specific “look” of a slide or group of slides. A design template can be very basic - with black text on a white background - or it can be very colorful and complex. Typically, PowerPoint presentations have the same design template for all slides, although it is possible to select a different design template for each slide. Later, I’ll show you how to select different design templates.

**Slide Show:** The way a presentation appears when you are presenting it. When you display your slides in a slide show, the slides typically take up the whole screen, and they appear in sequence.

**Placeholder:** Boxes with dotted or hatch-marked outlines that appear when you create a new slide. These boxes act as “placeholders” for objects such as the slide title, text, clip art, charts, and tables. Placeholders are sometimes called “text boxes.”

**Sizing handles:** Small circles that appear along the edges of the selection rectangle around an object on your slide. You drag a sizing handle to change the shape or size of an object. To maintain the proportions of an object while resizing, simply drag a corner handle.

**Online References**

https://www.ischool.utexas.edu/technology/tutorials/office/ppt03/02ppt_starting.html
http://www.duluth.umn.edu/~hrallis/guides/PP/PP1.html
http://gethelp.library.upenn.edu/workshops/biomed/ppt/open.html
http://www.electricteacher.com/tutorial3.htm
MODULE VI

THE INTERNET AND E-COMMERCE

Meaning and scope of the Internet. Creating, sending and receiving e-mails. Browsing the WWW. Downloading from and uploading to the Internet. Online shopping and e-business/e-commerce., E-market. (Concepts)

Part A: THE INTERNET

I. Meaning and scope of the Internet

The internet in simple terms is a network of the interlinked computer networking worldwide, which is accessible to the general public. These interconnected computers work by transmitting data through a special type of packet switching which is known as the IP or the internet protocol.

Internet is such a huge network of several different interlinked networks relating to the business, government, academic, and even smaller domestic networks, therefore internet is known as the network of all the other networks. These networks enable the internet to be used for various important functions which include the several means of communications like the file transfer, the online chat and even the sharing of the documents and web sites on the WWW, or the World Wide Web.

It is always mistaken said that the internet and the World Wide Web are both the same terms, or are synonymous. Actually there is a very significant difference between the two which has to be clear to understand both the terms. The internet and World Wide Web are both the networks yet; the internet is the network of the several different computers which are connected through the linkage of the accessories like the copper wires, the fiber optics and even the latest wireless connections. However, the World Wide Web consists of the interlinked collection of the information and documents which are taken as the resource by the general public. These are then linked by the website URLs and the hyperlinks. Therefore World Wide Web is one of the services offered by the whole complicated and huge network of the internet.

1: The Internet is a big collection of computers and cables.

The Internet is named for “interconnection of computer networks”. It is a massive hardware combination of millions of personal, business, and governmental computers, all connected like roads and highways. The Internet started in the 1960's under the original name “ARPAnet”. ARPAnet was originally an experiment in how the US military could maintain communications in case of a possible nuclear strike. With time, ARPAnet became a civilian experiment, connecting university mainframe computers for academic purposes. As personal computers became more mainstream in the 1980's and 1990's, the Internet grew exponentially as more users plugged their computers into the massive network. Today, the Internet has grown into a public spiderweb of millions of personal, government, and commercial computers, all connected by cables and by wireless signals.
No single person owns the Internet. No single government has authority over its operations. Some technical rules and hardware/software standards enforce how people plug into the Internet, but for the most part, the Internet is a free and open broadcast medium of hardware networking.

2: The Web is a big collection of HTML pages within the Internet.

The World Wide Web, or “Web” for short, is the very large subset of the Internet dedicated to broadcasting HTML pages. The Web is viewed by using free software called web browsers. Born in 1989, the Web is based on hypertext transfer protocol, the language which allows you and me to “jump” (hyperlink) to any other public web page. There are over 90 billion public web pages on the Web today, and over 300 billion private ('invisible') web pages.

History of the Internet

In 1969, the US Department of Defense started a project to allow researchers and military personnel to communicate with each other in an emergency. The project was called ARPAnet and it is the foundation of the Internet.

Throughout the 1970's, what would later become the Internet was developed. While mostly military personnel and scientists used it in its early days, the advent of the World Wide Web in the early 1990's changed all that.

Today, the Internet is not owned or operated by any one entity. This worldwide computer network allows people to communicate and exchange information in new ways.

The history of the Internet began with the development of electronic computers in the 1950s. The public was first introduced to the concepts that would lead to the Internet when a message was sent over the ARPANet from computer science Professor Leonard Kleinrock’s laboratory at University of California, Los Angeles (UCLA), after the second piece of network equipment was installed at Stanford Research Institute (SRI). Packet switched networks such as ARPANET, Mark I at NPL in the UK, CYCLADES, Merit Network, Tymnet, and Telenet, were developed in the late 1960s and early 1970s using a variety of protocols. The ARPANET in particular led to the development of protocols for internetworking, in which multiple separate networks could be joined together into a network of networks.

In 1982, the Internet protocol suite (TCP/IP) was standardized, and consequently, the concept of a world-wide network of interconnected TCP/IP networks, called the Internet, was introduced. Access to the ARPA network was expanded in 1981 when the National Science Foundation (NSF) developed the Computer Science Network (CSNET) and again in 1986 when NSFNET provided access to supercomputer sites in the United States from research and education organizations. Commercial Internet service providers (ISPs) began to emerge in the late 1980s and early 1990s. The ARPA network was decommissioned in 1990. The Internet was commercialized in 1995 when NSFNET was decommissioned, removing the last restrictions on the use of the Internet to carry commercial traffic.
Since the mid-1990s, the Internet has had a revolutionary impact on culture and commerce, including the rise of near-instant communication by electronic mail, instant messaging, Voice over Internet Protocol (VoIP) “phone calls”, two-way interactive video calls, and the World Wide Web with its discussion forums, blogs, social networking, and online shopping sites. The research and education community continues to develop and use advanced networks such as NSF’s very high speed Backbone Network Service (vBNS), Internet2, and National LambdaRail. Increasing amounts of data are transmitted at higher and higher speeds over fiber optic networks operating at 1-Gbit/s, 10-Gbit/s, or more. The Internet’s takeover over the global communication landscape was almost instant in historical terms: it only communicated 1% of the information flowing through two-way telecommunications networks in the year 1993, already 51% by 2000, and more than 97% of the telecommunicated information by 2007. Today the Internet continues to grow, driven by ever greater amounts of online information, commerce, entertainment, and social networking.

**Internet connection equipment**

There are certain requirements that the PC needs to be equipped with for the use of the internet connection on the computer. There are two basic parts in any sort of PC which supports the applications and programs used on the internet. These are the Hardware and the Software requirements.

The Hardware requirements are generally more demanding and complicated than the software requirements. The essential hardware needed to be installed on the computer for internet access include first of all a CPU with a Pentium of either 2, 3 or 4 Celeron, Duron or either Athlon. The memory of the PC should be at a minimum of 64MB but it is strongly recommended to have it more than that so as to increase the performance and the speed of the internet. The Video Graphics card is also a necessary requirement for the internet access; the card must support the resolution of 1024 x 768 pixels with the minimum of 256 colours.

The modems of the pc has to be a minimum of 56Kbps with the internal type configuration, or if the external type is used the fast serial port hardware is also required. However more than the modem the modern technologies of the DSL broadband connections are much better to use and strongly recommended. (Modem is discussed in detail in ‘glossary’ at the end of this chapter)

The software equipments for the internet connections are very few and reasonably easy to follow. A web browser is generally needed for the internet browsing and the visiting of the web sites. The most commonly used web browsers are the Internet Explorer, Chrome, Firefox and the Netscape Navigator. These browsers generally require the plug-ins for the use of the Flash which is a very common component of almost all internet web sites. (Browsers are discussed in detail later)
Advantages and disadvantages of the Internet

The internet is really useful and has a lot of advantages, but there are also some disadvantages of using it.

Advantages

**Faster Communication:** The foremost target of Internet has always been speedy communication and it has excelled way beyond the expectations. New innovations are only going to make it faster and more reliable. Now, you can communicate in a fraction of second with a person who is sitting in the other part of the world. With the help of such services, it has become very easy to establish a kind of global friendship where you can share your thoughts and explore other cultures.

**Information Resources:** Information is probably the biggest advantage that Internet offers. Internet is a virtual treasure trove of information. Any kind of information on any topic under the sun is available on the Internet. The search engines like Google, Yahoo are at your service on the Internet. There is a huge amount of information available on the Internet for just about every subject known to man, ranging from government law and services, market information, new ideas and technical support. Today, it is almost required that students should use it for research or the purpose of gathering resources.

**Entertainment:** Entertainment is another popular reason why many people prefer to surf the Internet. In fact, the Internet has become quite successful in trapping the multifaceted entertainment industry. Downloading games or just surfing the celebrity websites are some of the uses people have discovered. Even celebrities are using the Internet effectively for promotional campaigns.

**Social Networking:** One cannot imagine an online life without Facebook or Twitter. Social networking has become so popular amongst youth that it might one day replace physical networking. It has evolved as a great medium to connect with millions of people with similar interests. Apart from finding long-lost friends, you can also look for a job, business opportunities.

**Online Services:** The Internet has made life very convenient. With numerous online services you can now perform all your transactions online. You can book tickets for a movie, transfer funds, pay utility bills, taxes etc., and right from your home.

Disadvantages

**Theft of Personal Information:** If you use the Internet for online banking, social networking or other services, you may risk a theft to your personal information such as name, address, credit card number etc. People can access this information through unsecured connections or by planting software and then use your personal details for their benefit. Needless to say, this may land you in serious trouble.
Virus Threat: Internet users are often plagued by virus attacks on their systems. Virus programs are inconspicuous and may get activated if you click a seemingly harmless link. Computers connected to the Internet are very prone to targeted virus attacks and may end up crashing.

Pornography: Pornography is perhaps the biggest disadvantage of the Internet. Internet allows you to access and download millions of pornographic photos, videos and other X-rated stuff. Such unrestricted access to porn can be detrimental for children and teenagers.

Social Disconnect: Thanks to the Internet, people now only meet on social networks. More and more people are getting are drifting apart from their friends and family. Even children prefer to play online games rather than going out and mingling with other kids.

Uses of Internet

Internet has been the most useful technology of the modern times which helps us not only in our daily lives, but also our personal and professional lives developments. The internet helps us achieve this in several different ways.

For the students and educational purposes the internet is widely used to gather information so as to do the research or add to the knowledge of any sort of subject they have. Even the business personals and the professions like doctors, access the internet to filter the necessary information for their use. The internet is therefore the largest encyclopedia for everyone, in all age categories.

The internet has served to be more useful in maintaining contacts with friends and relatives who live abroad permanently. The easiest communication means like the internet chatting systems and the emails are the best and the most common for the maintaining contacts with the people around the world.

Not to forget internet is useful in providing with most of the fun these days. May it be all the games, and networking conferences or the online movies, songs, dramas and quizzes, internet has provided the users with a great opportunity to eradicate the boredom from their lives.

Internet is also used to upgrade the internet and use special software to work on the projects and documentation works as the internet enables the user to download a myriad of different software for a variety of different purposes, making it much easier than buying the costly software CDs.

Applications required of Internet

There are many different applications of the internet used commonly across the world. The most common names are the JAVA, JAVA script and the Flash. These are the most useful as well as the most frequently used applications which need to be installed on the computer before the full access of the internet can be guaranteed.
The flash is required for the animated videos and pictures. For example the electronic greeting cards these days used extensively for various occasions all require the us if the internet application Flash. Some websites which are used to upload videos online like the most commonly used YouTube also require the latest flash player to work. Every other website consists of flash content these days and so it is one of the most useful applications of the internet.

Another mentioned application which is also well-known is the JAVA; java is also needed for the internet access to a certain extent. For example using the ftp services on the internet, you need to have the JAVA technology JVM to be able to manage and control the documentation transfers.

These applications are basically used to run the applets on the internet web pages which are made to work with them, without these tools the internet though can be easily accessed it does not offer all the features to the user, which might also be some useful information.

The internet applications all reduce the traffic on the network and thus make the server work on a much optimized level. All the applications are interoperable, and support the cross platforms, both of the OS servers and the clients.

**Role of Internet in the modern era**

The modern era has been now extremely advanced and well-developed and the basic reason for this development is actually the launch of the internet and its applications which have provided the individuals with the easiest routine in their daily lives.

The modern era of the internet has made even the most tiring and physically demanding works on the finger tips. For example the shopping which is indeed a very complicated affair, can be easily done on the internet in the modern times, via e-commerce. This technology has emerged as one of the breakthrough uses of the internet.

The internet has changed the face of the lives of people, turning them completely into the modern and latest lifestyle with its developments. Today, instead of the newspapers, the people use the internet to access the e-news which provides with not only the newspapers completely but also various different news channels from all over the world. Even the live video news from the news channels can be accessed through the net, overpowering the other media, even including the television.

The modern developments through the internet have also widened the opportunities for business and professional developments. The need to advertise the products of any business companies are no more a major problem, as the companies can develop their own website and information regarding the products to convince the customers with their works.

There are also several open opportunities of making money through the internet, with the most common profession being the web site development with the increasing demand of web-development personals used to develop the websites to promote their business and companies.
Internet is indeed the major advancement in the modern era, enabling the common people to sit at home and rule the world.

**Internet in education**

Education these days has been the top priority for any family or individual person, and no doubt amongst the latest technologies to promote and maintain the education standards the internet comes first.

Internet is not only an access to websites, these days there is knowledge and information on every aspect of the educational world over the internet. The resources provided on various web pages are indeed very informative and useful for professionals and students related to every field of work. The only pre-requisite is the research over the internet for a specific educational topic, and then this information just needs to be filtered to gain the basic knowledge of what you are looking for. Therefore, these are true internet resources which deal with every individual's educational needs.

Internet has also provided the opportunity to study online. There are virtual universities set up, in which the students can take classes sitting on the computer seat opening the university's website video section according the topic, and then study at home.

The most amazing thing about internet education is that the international education is no more a chance for only the wealthy and high profile family students because now via internet no matter if one can afford to study in top most universities, people can easily benefit from the international quality education and gain a respectable university degree sitting at home through the online educational courses provided by the world universities.

Internet education thus also provides the individuals to balance their time according to their own needs, as there is no fixed time to attend the lectures. This also allows the poor class of people to work and study at the same time through internet education.

1. Assortment of Information

   Lots of information of different kinds is kept on the web server on the Net. This means that millions web sites include various data in the shape of images and text. On every subject of the planet information can be easily collected by you. For this function, special sites, called search engines can be found on the Internet to search data of each and every subject of the planet.

2. Online Medical Guidance

   Several web sites will also be on the Web to obtain details about various conditions. You are able to consult with a cell of on-line physicians to obtain guidance about any medical problem. In addition, lots of material can also be on the Web for research in medical industry.

3. Looking for Jobs

   You are able to search various kinds of jobs throughout their vacant vacancies are advertised by the world, Most of the organizations/departments around the world, on the web.
The search engines will also be employed to search the jobs on the web. You are able to make an application for the necessary work through the Web.

4. Communication/ **Video call / video conferencing:**

   You are able to keep in touch with other through Internet all over the world. You could speak by seeing to one another; only you’re speaking with your pals in your drawing room. For this function, various services are supplied on the Internet such as; speaking, video conferencing, Email and Internet telephone etc.

5. Information

   The Web enables students to see the most recent news on a particular topic they’re learning. If they’re learning American politics they may do an information search and discover what is happening on the planet of politics at that very time.

   It will help them link what they’re understanding how to real life. Additionally, it may keep them thinking about a topic.

6. Online Training

   The facility is provided by the internet to obtain an online training. Several web sites of different colleges offer lessons and classes on different subjects or subjects. You may also obtain these classes or lessons in your personal computer. You are able to hear these classes repeatedly and obtain a large amount of understanding. It’s very simple and cheap method to get training.

7. Encyclopedia

   Occasionally, encyclopaedia might not constantly be accessible to individuals and so they might have trouble with in getting the use of the actual guides within the selection.

   If that’s the case, the encyclopaedia of various topics on the Web could be useful.

8. Online Railway and Airplane Schedules

   Today, railway and several Airline businesses offer their timing of trains and routes respectively on the web.

9. Online Results

   Today, all of the training boards and colleges present result on the web. Their results can be watched by the students from any kind of nation or world.

10. Advertisement

    Today, products are advertised by most of the commercial organizations through Internet. It’s effective and inexpensive method for the marketing of goods.
RSS Reader

RSS stands for Really Simple Syndication. It is actually known to be a community or family of the Web Feed formats which is widely used for the publishing of the updates and contents like the blogs, news, podcasts or a variety of other frequent updates. There are special documents for the RSS which is more commonly known as the feed, or the channel, it contains the summarized content of any website or the full text itself.

The RSS reader is actually a program, which is made to read the RSS and also the news feeds from the Atom. RSS Reader works in a very simple yet efficient way. It collects the news in the background at intervals of the user configuration with the popup indicating the arrival of a new message. The popup can be just clicked to view the headline with the short description to go with it or there is also an option of the opening of the original webpage in the RSSReader browser itself or the other browser you are using.

RSS is actually a format for the syndication of news, and because of this reason a variety of news and web log sites support the RSS by including them in their web pages. The RSS Reader is easy to install and use as it is a freeware which indicates that the complete package can be installed without any type of shortcoming or modification to the original settings.

Blog

Blog is one of those internet arrivals that have gained immense popularity and are still very commonly used over the internet. A blog is known to be a type of website which contains entries written chronologically and displayed in the reverse chronological order.

Blog is also said to be the act of maintaining or adding the content on the website. Blogs, basically are focused on one particular type of topic, mostly which is on the news, commentary or even updates. It can include the subjects like food, politics, fashion etc. It can also be more personal and can be used to write online diaries and experiences on a more personal level.

A typical blog contains all the text, and information including the images, and links to other blogs and websites for a particular topic. The distinguishing feature of the Blogs is that the format is quite interactive and approachable to the reader, mostly because the style has to be casual and personal. Blogs are mostly all of them based on texts but sometimes to support the matter the images, music and even videos are included.

There are many different types of blogging. Micro-blogging is one such type which is associated with only the very short posts in the blog. The blogs containing the media type materials are known are categorized differently, the one with videos are called the vlog, those which consist of the links are the linklog and in the same way the ones containing the photos are known as the photolog.
Blogs can be on various different topics and subjects like the fashion blogs, travel blogs etc, however there is one more such type of blog which focuses on spamming and is known as the Splog.

There are some special search engines which are used to search some specific types of blogs over the internet.

**Search Engine (Web Search Engines)**

Search engines are programs that search documents for specified keywords and returns a list of the documents where the keywords were found. It is a software program or script available through the Internet that searches documents and files for keywords and returns the results of any files containing those keywords. Basically, a search engine is a software program that searches for sites based on the words that you designate as search terms. Search engines look through their own databases of information in order to find what it is that you are looking for.

A search engine is a web-based tool that enables users to locate information on the World Wide Web. A search engine makes it possible to find a specific bit of information amongst the huge mass of data stored on the web.

The first search engine ever developed is ‘Archie’, which was used to search for FTP files and the first text-based search engine is ‘Veronica’. Today, there are thousands of different search engines available on the Internet, each with their own abilities and features.

A search engine gives information on websites, images, videos, maps, blogs, books etc. In some search engines, instead of typing the key word, one can use images to find similar images. Similarly in some search engines voice can be used to input a query. (See Google.com)

**How Do Search Engines Work?**

The concept behind a search engine is no different from the search function available on every personal computer that searches just that machine. Because the web is so big, for a search engine to work quickly enough to find answers before users lose patience, it must have some idea where to look. Search engines catalogue the web by sending out a piece of software called a spider, crawler, or ‘bot’ (robot) that analyses the content on each page it finds and builds an index based on that information.
It’s a complex process and the owners of search engines are often secretive about the inner workings of their software - especially how it decides which pages are the most relevant to a particular search and therefore should appear at the top of the list of results. Essentially, a search engine is a computer program. Typically, Web search engines work by sending out a spider to fetch as many documents as possible. Another program, called an indexer, then reads these documents and creates an index based on the words contained in each document. Each search engine uses a proprietary algorithm to create its indices such that, ideally, only meaningful results are returned for each query.

**How to Search**

Searching the web include incredibly detailed processes and methodologies, and are updated all the time. This is a bare bones look at how search engines work to retrieve your search results. All search engines go by this basic process when conducting search processes, but because there are differences in search engines, there are bound to be different results depending on which engine you use.

1. The searcher types a query into a search engine.
2. Search engine software quickly sorts through literally millions of pages in its database to find matches to this query.
3. The search engine's results are ranked in order of relevancy.

Each search engine's software is a little different, so the same search terms will produce different lists of results from different search engines. That doesn't necessarily mean that one is more accurate than another, but it may mean that you find one more useful than another. So, use whichever search engine you're most comfortable with.

Website owners help search engines analyse their pages correctly by using common keywords to identify the subject and by providing additional information about their pages (known as ‘metadata’). These techniques are called SEO - ‘search engine optimisation’ - and are studied in detail by those wishing to attract customers to their sites.

**Major search engines**

Google - The world's most popular search engine.

Bing Search: Microsoft's search engine

Yahoo! Search: The 2nd largest search engine on the web


Cuil: Cuil was a search engine website (pronounced as Cool) developed by a team of ex-Googlers
Excite: Now an Internet portal, was once one of the most recognized brands on the Internet. One of the famous 90's dotcoms.

Go.com: The Walt Disney Group's search engine is now also an entire portal. Family-friendly!

HotBot was one of the early Internet search engines (since 1996) launched by Wired Magazine. Now, just a front end for Ask.com and MSN.

AllTheWeb: Search tool owned by Yahoo and using its database, but presenting results differently.

Galaxy: More of a directory than a search engine. Launched in 1994, Galaxy was the first searchable Internet directory. Part of the Einet division at the MCC Research Consortium at the University of Texas, Austin

Live Search (formerly Windows Live Search and MSN Search) Microsoft's web search engine, designed to compete with Google and Yahoo!. Included as part of the Internet Explorer web browser.

Lycos: Initial focus was broadband entertainment content, still a top 5 Internet portal and the 13th largest online property according to Media Metrix.

Google Book Search The power of Google to find books. Google's entry will not let you see full text if the copyright is still active in your jurisdiction.

Email-Search.org: A mini-portal with a number of tools for searching email addresses. Find current, former email addresses, extract them from the web.

Wink: Wink People Search: Over 333,304,647 people on social networks and across the Web. Find people using name search, location, school, work, interests, and more.

Rediff: India - India's leading internet portal for news, mail, messenger, entertainment, business, mobile, ecommerce, shopping, auctions, search, sports and more.

CV Fox: A search engine that is designed to hunt down and retrieve resumes (CV's) from all over the Internet. Free to use, has become a popular tool with professional recruiters.

Naukri.com (India): An India-focused job search engine.

Google Maps: Provides directions, interactive maps, and satellite/aerial imagery of the United States as well as other countries. Can also search by keyword such as type of business.

MetaCafe: Search videos hosted by MetaCafe. If you are a producer of videos, you can get paid for videos - the more viewers, the more cash.

LinkedIn is a business-oriented social networking site used for professional networking. As of March 2008, it had more than 20 million registered users. An easy way to search for business people or professionals.


MetaCafe: Search videos hosted by MetaCafe. If you are a producer of videos, you can get paid for videos - the more viewers, the more cash.

YouTube: Owned by Google, the web's largest media site. This search will search through the videos of YouTube only.

blinkx: Over 18 million hours of video. Search it all. Blinkx is a multi-media metasearch engine searching the media files of sites such as YouTube, MetaCafe, GoogleVideo, MySpace and more.

FreeBookSearch.net: The famous book searching portal also searches for audiobooks. This same search will also find MP3 files.

FindSounds: Search engine to find any kind of sound file: WAV, MP3, AIFF, AU - search by sample rate and quality... a great place to find those sound effects.

Ask Jeeves was designed to allow users to get answers to questions posed in everyday, natural language. Ask.com was the first such commercial question-answering search engine for the Web.

About.com. The majority of their results come from their own site. Used to be miningco.com.

Answers.com offers free access to millions of topics from the world's leading publishers.

Yahoo! Answers is a community-driven knowledge market website launched by Yahoo! that allows users to ask questions of other users and answer other users' questions. Over 60 million users.

Google University Search allows you to search a specific site - one school at a time

Types of Search Engines

Crawler-Based Search Engines

Crawler-based search engines use automated software programs to survey and categorise web pages. The programs used by the search engines to access your web pages are called ‘spiders’, ‘crawlers’, ‘robots’ or ‘bots’.

A spider will find a web page, download it and analyse the information presented on the web page. This is a seamless process. The web page will then be added to the search engine’s database. Then when a user performs a search, the search engine will check its database of web pages for the key words the user searched on to present a list of link results.
The results (list of suggested links to go to), are listed on pages by order of which is ‘closest’ (as defined by the ‘bots’), to what the user wants to find online.

Crawler-based search engines are constantly searching the Internet for new web pages and updating their database of information with these new or altered pages.

Examples of crawler-based search engines are:

- Google (www.google.com)
- Ask Jeeves (www.ask.com)

**Directories**

A ‘directory’ uses human editors who decide what category the site belongs to; they place websites within specific categories in the ‘directories’ database. The human editors comprehensively check the website and rank it, based on the information they find, using a pre-defined set of rules.

There are two major directories at the time of writing:

- Yahoo Directory (www.yahoo.com)
- Open Directory (www.dmoz.org)

Note: Since late 2002 Yahoo has provided search results using crawler-based technology as well as its own directory.

**Hybrid Search Engines**

Hybrid search engines use a combination of both crawler-based results and directory results. More and more search engines these days are moving to a hybrid-based model. Examples of hybrid search engines are:

- Yahoo (www.yahoo.com)
- Google (www.google.com)

**Meta Search Engines**

A metasearch engine is a search tool that sends user requests to several other search engines and/or databases and aggregates the results into a single list or displays them according to their source. Metasearch engines enable users to enter search criteria once and access several search engines simultaneously. Metasearch engines operate on the premise that the Web is too large for any one search engine to index it all and that more comprehensive search results can be obtained by combining the results from several search engines. This also may save the user from having to use multiple search engines separately.
The term “metasearch” is frequently used to classify a set of commercial search engines, see the list of search engines, but is also used to describe the paradigm of searching multiple data sources in real time. The National Information Standards Organization (NISO) uses the terms Federated Search and Metasearch interchangeably to describe this web search paradigm.

It is thus a search engine that queries other search engines and then combines the results that are received from all. In effect, the user is not using just one search engine but a combination of many search engines at once to optimize Web searching.

In a meta-search engine, you submit keywords in its search box, and it transmits your search simultaneously to several individual search engines and their databases of web pages. Within a few seconds, you get back results from all the search engines queried. Meta-search engines do not own a database of Web pages; they send your search terms to the databases maintained by search engine companies.

Meta search engine example, Dogpile is a metasearch engine.

Dogpile: Brings together searches from the top search engines including Google, Yahoo! Search, Live Search, Ask.com, About, MIVA, LookSmart, and more.

MetaCrawler is a metasearch engine that blends the top web search results from Google, Yahoo!, Live Search, Ask.com, About.com, MIVA, LookSmart and other popular search engines.
MetaLib is a federated search system developed by Ex Libris. MetaLib conducts simultaneous searches in multiple resources such as library catalogs, journal articles, newspapers and the web.

**Specialty Search Engines**

Specialty search engines have been developed to cater for the demands of niche areas. There are many specialty search engines, including:

**Shopping**
- Froogle ([www.froogle.com](http://www.froogle.com))
- Yahoo Shopping ([www.shopping.yahoo.com](http://www.shopping.yahoo.com))
- BizRate ([www.bizrate.com](http://www.bizrate.com))
- PriceGrabber ([www.pricegrabber.com](http://www.pricegrabber.com))
- PriceSpy ([www.pricespy.co.nz](http://www.pricespy.co.nz))

**Local Search**
- NZPages ([www.nzpages.co.nz](http://www.nzpages.co.nz))
- SearchNZ ([www.searchnz.co.nz](http://www.searchnz.co.nz))
- NZS ([www.nzs.com](http://www.nzs.com))

**Domain Name Search**
- iServe ([www.iserve.co.nz](http://www.iserve.co.nz))
- Freeparking ([www.freeparking.co.nz](http://www.freeparking.co.nz))

**Freeware & Shareware Software Search**
- Tucows ([www.tucows.com](http://www.tucows.com))
- CNET Download.com ([www.download.com](http://www.download.com))

**Search engine optimization**

Search engine optimizations (SEO) the focal point of internet marketing. This internet marketing innovation is becoming popular day-by-day providing profit worth billions to companies who are using their services. A business, which is still at its nascent stage of development, can gain immense visibility and turnover in sales if they adopt the right SEO services.

There are two reasons why most people log on to the internet. One is for communication and the secondly it is to search for information on relevant products and services offered by various businesses. Since there is cutthroat competition between businesses in the same category these days, hence the need for a good facilitator is essential. SEO marketing will help a company to create a presence for itself to the potential customers. The popular search engines include Yahoo and Google.
Search engine optimization is the main driver to increase search ranks of websites. This is done by including additional contents relevant to keywords used by people during their searches. This is done based on the indexed data for storage.

The information that is updated into the websites is beneficial to both the site owner and the visitors. Visitors need to log on a certain keyword in the search engines like Yahoo, Google or Bing and an entire list of relevant websites pertaining to that keyword will appear. The site owner on the other hand has an opportunity to provide useful information to the visitors. The most important part being that they get to promote their products and services online.

However, SEO marketing has its disadvantages too. Sometimes it has a negative influence on the web world.

While it gives information to the visitors but at the same time people misuse this. Many site owners add unnecessary content to the websites, which has no relevance to the keyword. This spreads a bad word about sites, which genuinely give informative content. Search engines like yahoo and Google have to verify websites due to such misuse.

Nevertheless, the advantages of Search engine optimisation surpass their disadvantages. It helps to drive optimal traffic to the sites and provides the best online marketing strategies for companies. An increase in traffic leads to better sales and wider customer base. Their services are more cost effective and the reach is much more as compared to the traditional forms of advertising like TV, print, radio etc.

II. Creating, sending and receiving e-mails

Email, e-mail or electronic mail is the transmission of messages (emails or email messages) over electronic networks like the internet. The first e-mail was sent by Ray Tomlinson in 1971.

The messages sent on email can be notes entered from the keyboard or electronic files a (documents, images, sound etc) stored on disk. Most mainframes, minicomputers, and computer networks have an e-mail system. Some electronic-mail systems are confined to a single computer system or network, but others have gateways to other computer systems, enabling users to send electronic mail anywhere in the world. Companies that are fully computerized make extensive use of e-mail because it is fast, flexible, and reliable.
Most e-mail systems include a rudimentary text editor for composing messages, but many allow you to edit your messages using any editor you want. You then send the message to the recipient by specifying the recipient's address. You can also send the same message to several users at once. This is called broadcasting.

Sent messages are stored in electronic mailboxes until the recipient fetches them. To see if you have any mail, you may have to check your electronic mailbox periodically, although many systems alert you when mail is received. After reading your mail, you can store it in a text file, forward it to other users, or delete it. Copies of memos can be printed out on a printer if you want a paper copy.

All online services and Internet Service Providers (ISPs) offer e-mail, and most also support gateways so that you can exchange mail with users of other systems. Usually, it takes only a few seconds or minutes for mail to arrive at its destination. This is a particularly effective way to communicate with a group because you can broadcast a message or document to everyone in the group at once.

Although different e-mail systems use different formats, there are some emerging standards that are making it possible for users on all systems to exchange messages. In the PC world, an important e-mail standard is MAPI. The CCITT standards organization has developed the X.400 standard, which attempts to provide a universal way of addressing messages. To date, though, the de facto addressing standard is the one used by the Internet system because almost all e-mail systems have an Internet gateway.

History of E-mail

E-mail is much older than ARPANet or the Internet. It was never invented; it evolved from very simple beginnings.

Early email was just a small advance on what we know these days as a file directory - it just put a message in another user's directory in a spot where they could see it when they logged in. Simple as that. Just like leaving a note on someone's desk.

Probably the first email system of this type was MAILBOX, used at Massachusetts Institute of Technology from 1965. Another early program to send messages on the same computer was called SNDMSG.
Some of the mainframe computers of this era might have had up to one hundred users - often they used what are called “dumb terminals” to access the mainframe from their work desks. Dumb terminals just connected to the mainframe - they had no storage or memory of their own, they did all their work on the remote mainframe computer.

Before internetworking began, therefore, email could only be used to send messages to various users of the same computer. Once computers began to talk to each other over networks, however, the problem became a little more complex - We needed to be able to put a message in an envelope and address it. To do this, we needed a means to indicate to whom letters should go that the electronic posties understood - just like the postal system, we needed a way to indicate an address.

This is why Ray Tomlinson is credited with inventing email in 1972. Like many of the Internet inventors, Tomlinson worked for Bolt Beranek and Newman as an ARPANET contractor. He picked the @ symbol from the computer keyboard to denote sending messages from one computer to another. So then, for anyone using Internet standards, it was simply a matter of nominating name-of-the-user@name-of-the-computer. Internet pioneer Jon Postel, who we will hear more of later, was one of the first users of the new system, and is credited with describing it as a “nice hack”. It certainly was, and it has lasted to this day.

Despite what the World Wide Web offers, email remains the most important application of the Internet and the most widely used facility it has. Now more than 600 million people internationally use email.

By 1974 there were hundreds of military users of email because ARPANET eventually encouraged it. Email became the saviour of Arpanet, and caused a radical shift in Arpa's purpose.

Things developed rapidly from there. Larry Roberts invented some email folders for his boss so he could sort his mail, a big advance. In 1975 John Vital developed some software to organize email. By 1976 email had really taken off, and commercial packages began to appear. Within a couple of years, 75% of all ARPANET traffic was email.

Email took us from Arpanet to the Internet.

One of the first new developments when personal computers came on the scene was “offline readers”. Offline readers allowed email users to store their email on their own personal computers, and then read it and prepare replies without actually being connected to the network - sort of like Microsoft Outlook can do today.
This was particularly useful in parts of the world where telephone costs to the nearest email system were expensive. With connection charges of many dollars a minute, it mattered to be able to prepare a reply without being connected to a telephone, and then get on the network to send it. It was also useful because the “offline” mode allowed for more friendly interfaces. Being connected direct to the host email system in this era of very few standards often resulted in delete keys and backspace keys not working, no capacity for text to “wrap around” on the screen of the users computer, and other such annoyances. Offline readers helped a lot.

The first important email standard was called SMTP, or simple message transfer protocol. SMTP was very simple and is still in use - however, as we will hear later in this series, SMTP was a fairly naïve protocol, and made no attempt to find out whether the person claiming to send a message was the person they purported to be. Forgery was (and still is) very easy in email addresses. These basic flaws in the protocol were later to be exploited by viruses and worms, and by security frauds and spammers forging identities. Some of these problems are still being addressed in 2004.

But as it developed email started to take on some pretty neat features. One of the first good commercial systems was Eudora, developed by Steve Dorner in 1988. Not long after Pegasus mail appeared.

When Internet standards for email began to mature the POP (or Post Office Protocol) servers began to appear as a standard - before that each server was a little different. POP was an important standard to allow users to develop mail systems that would work with each other.

These were the days of per-minute charges for email for individual dialup users. For most people on the Internet in those days email and email discussion groups were the main uses. These were many hundreds of these on a wide variety of topics, and as a body of newsgroups they became known as USENET.

With the World Wide Web, email started to be made available with friendly web interfaces by providers such as Yahoo and Hotmail. Usually this was without charge. Now that email was affordable, everyone wanted at least one email address, and the medium was adopted by not just millions, but hundreds of millions of people.

Email terminology

The email message - Instead of using a pen to write a letter on paper, you're using your keyboard to type an email message in an email program on your computer.
Sending the email - When the email is finished and has been addressed to the recipient's email address, you don't put a stamp on it and post it but press the Send button in the email program. This makes the email message go on its journey.

Email transport - Like postal services transport letters and parcel, email servers transmit email messages from sender to recipient. Usually, emails are not delivered to the recipient directly, though, but waiting at the “nearest” mail server to be picked up by them.

Fetching new mail - If you've got new mail in your mailbox, you go and fetch it. Similarly, your email program can check for new email messages at your mail server and download them for you to read.

e-mail address

abc@xyz.com

The first portion all e-mail addresses is the alias, user, group, or department of a company. In our above example abc is the customer relation department at xyz company. Next, the @ (at sign) is used as a divider in the e-mail address and is always required for all SMTP e-mail addresses and was first used by Ray Tomlinson. Finally, xyz.com is the domain name of where the user belongs.

Types of email

POP3, SMTP, and other e-mail server types

When setting up an e-mail account in Windows Mail, you'll be asked to select the type of e-mail server your account uses. Windows Mail supports the following e-mail server types.

- Post Office Protocol 3 (POP3) servers hold incoming e-mail messages until you check your e-mail, at which point they're transferred to your computer. POP3 is the most common account type for personal e-mail. Messages are typically deleted from the server when you check your e-mail.

- Internet Message Access Protocol (IMAP) servers let you work with e-mail messages without downloading them to your computer first. You can preview, delete, and organize messages directly on the e-mail server, and copies are stored on the server until you choose to delete them. IMAP is commonly used for business e-mail accounts.

- Simple Mail Transfer Protocol (SMTP) servers handle the sending of your e-mail messages to the Internet. The SMTP server handles outgoing e-mail, and is used in conjunction with a POP3 or IMAP incoming e-mail server.
Types of Email Programs

Many companies have email programs which can be used to collect, store, and organize your electronic correspondence.

Microsoft Office Outlook

Perhaps the most well-known program for email is Microsoft Office Outlook. This program, part of Microsoft's Office suite of programs, is a powerhouse program which allows you to download email and then sort it pretty much however you want. The program offers a “rules” option which allows email to be automatically sorted and moved into folders. The program provides different backgrounds and fonts for your email messages and the ability to flag them for various levels of importance. Another thing which makes Outlook the choice for businesses all over the world is the incorporation of a task list, calendar, and contact book. With these four options, Outlook can adeptly help organize your life.

Thunderbird

Mozilla, creator of the Firefox web browser, entered the email client market with the release of Thunderbird in 2004. Thunderbird is a free open source email program which quickly and easily gives you access to your email and news feeds. Like Outlook, this program accepts both POP and IMAP email, meaning you can use this program to access any of your web-based email from servers like Hotmail or Yahoo! If you are in the market for a basic email program, this might be the one you are looking for. It is extremely stripped down compared to Outlook, with the most noticeable omission being any sort of calendar (however, there is a plug-in which you can add).

Google Mail

When Google first introduced its email client, it provided access only through a web browser. However, Google introduced an application that can now be downloaded to your computer which will allow you to access your Google Mail account without opening your browser. Gmail is an extremely friendly program that keeps emails with the same subject together, making it easy to follow email trails, especially if there are multiple people involved. The program also allows users to set labels for their emails to group emails with similar content. As Google has announced that it is moving toward more web-based applications, Gmail is completely web-based. The program opens the Gmail home page in a stand-alone window. This program integrates seamlessly with the Google Documents and Calendar as well. The only downside to Gmail is users have to have a Google account and use Gmail as their primary email address for the program to work.

Following are the major (free) email services:

1. Gmail is the Google approach to email and chat. Practically unlimited free online storage allows you to collect all your messages, and Gmail's simple but very smart interface lets you find them precisely and see them in context without effort. POP and powerful IMAP access bring Gmail to any email program or device.
Gmail puts contextual advertising next to the emails you read. This is how they raise revenue to meet the expenses and provide us free email.

2. Yahoo! Mail is your ubiquitous email program on the web. Windows 8 and mobile devices with unlimited storage, SMS texting, social networking and instant messaging to boot. While Yahoo! Mail is generally a joy to use, free-form labeling and smart folders would be nice, and the spam filter could catch junk even more effectively.

3. Mail.com and GMX Mail are reliable email services filtered well of spam and viruses whose unlimited online storage you can use with a rich web interface and mobile apps. POP and iMAP access are available as a paid add-on.

4. Outlook.com serves free email with practically unlimited storage accessible on the web with a rich and helpful interface or using POP and Exchange ActiveSync in email programs on desktop and mobile device.

5. iCloud Mail is a free email service from Apple with ample storage, IMAP access and an elegantly functional web application. That interface at icloud.com does not offer labels or other more advanced tools for productivity and for organizing mail, though, and does not support accessing other email accounts. POP access to iCloud Mail is missing, too.

6. Windows Live Hotmail is a free email service that gives you unlimited storage, fast search, solid security, POP access and an interface easy as a desktop email program.

7. AIM Mail, AOL's free web-based email service, shines with unlimited online storage, very good spam protection and a rich, easy to use interface.

8. Shortmail emphasizes easy, fast and effective communication with an email service limited, essentially, to 500 characters per message. Longer emails can be forwarded, and Shortmail offers simple but effective tools to organize and find mail. Still, hassling senders the way Shortmail does is not without peril, and you may wish for better productivity tools.

9. Facebook Messages combines emails with everybody, conversations with Facebook friends and SMS texts in a single, simple place organized by the people with whom you communicate. Facebook Messages's chasteness works well for a limited amount of personal mail, texts and messages, but to handle all your mail, Facebook Messages could do well with more robust tools for managing emails and contacts.

Creating an email account

Your internet service provider (ISP) will almost certainly provide you with an email address if you’re using your own computer.

If you’re going to a public place (like a library) to access the internet, then there are ways of getting a webmail account. The most popular are Gmail (run by Google), Microsoft's
Hotmail (now replaced by Outlook.com) and Yahoo! Mail, but there are many others to choose from. The sign-up process for most email accounts is quite similar.

When you visit one of these sites for the first time, find the “log in” or “sign up” text. Click on it and select “sign up”. Enter your chosen user name (the site will tell you if it’s already taken and offer alternatives) and a password. It will then set you up with an email account. Log in with your username and password, hit “create mail” and you can start sending your first email immediately.

**How to send and receive e-mail**

To send and receive e-mail messages you can use an e-mail program, also known as an e-mail clientsuch as Microsoft Outlook or Mozilla Thunderbird. When using an e-mail client you must have a server that stores and delivers your e-mail this service is provided by your ISP but can also be a service provided by another company. The e-mail client will connect to the server to download all new e-mail and deliver any unsent e-mail.

An alternative way of sending and receiving e-mail and a more popular solution for most people is an online e-mail service or webmail such as Hotmail, Gmail, and Yahoo Mail. Many of the online e-mail services including the above examples are free or have a free account option.

**Writing an e-mail**

When writing a new e-mail message a window similar to the below example will appear. As can be seen, several fields are required when sending an e-mail, the From or Reply-To is a field that is automatically filled out and is where the e-mail will return if a reply is made. Next, the CC or Carbon Copy field allows you to send a copy of the message to another e-mail address, but is not a required field. The To field is where you type the e-mail address of who you are sending the e-mail address. Next, the subject line although not required should be a few words describing what the e-mail is about. Finally, the message body will be the location you type your message and is what will contain your signature.
**Difference between POP3 and IMAP**

POP3 and IMAP are two different protocols used to access email. POP3 and IMAP function very differently and each has its own advantages. POP3 is useful in checking emails from a computer that is in a specific location. IMAP is the better option when you need to check your emails from multiple locations, such as at work, from home, or on the road, using different computers.

Given below are the differences between POP3 and IMAP.

<table>
<thead>
<tr>
<th>POP3 - Post Office Protocol</th>
<th>IMAP - Internet Messaging Access Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>You can use only one computer to check your email</td>
<td>You can use multiple computers to check your email</td>
</tr>
<tr>
<td>Your mails are stored on the computer that you use</td>
<td>Your mails are stored on the server</td>
</tr>
<tr>
<td>Outgoing email is stored locally on your PC</td>
<td>Outgoing email is filtered to a mailbox on the server for accessibility from another machine.</td>
</tr>
</tbody>
</table>

**Difference between email and webmail**

Both webmail and email clients are applications for sending and receiving email, and they use similar methods for doing this. Webmail is an application that is written to be operated over the internet through a browser, usually with no downloaded applications or additional software necessary. All of the work, so to speak, is done by remote computers (i.e. servers and machines you connect to through the internet).

Email clients are programs that are installed on local machines (i.e. your computer, or the computers in your office) to interact with remote email servers to download and send email to whomever you might care to. Some of the back end work of sending email and all of the front
end work of creating a user interface (what you look at to receive your email) is done on your computer with the installed application, rather than by your browser with instructions from the remote server. However, many webmail providers allow users to use email clients with their service—and here’s where it may start to get confusing.

Examples of webmail: Gmail, Hotmail,

Examples of email: Microsoft Outlook, Windows Live Mail, or Mozilla Thunderbird

Let us explain with the help of an example

We sign up for a new email address with Google’s Gmail and begin sending and receiving email through the webmail service. Google is providing two things for us—a web frontend, and a mail server backend for sending and receiving the emails. We communicate with the email server backend by using the webmail frontend. Through our pointing, clicking, and typing, we’re telling the email server who we want to send email to, and what we want to say.

But, we might decide that we don’t like Google’s new look for Gmail, so we decide to switch to an email client, like the free program Thunderbird. Instead of using our web based client (Gmail’s web interface) to interact with Google’s Gmail servers (the mail server backend), we use a program installed on our computers (in this case, Thunderbird) to contact the mail server backend ourselves, and sidestep webmail altogether. Google (and other webmail providers) offer all of these products, including the web frontend and the mail server backend. You can use both of them or only the mail server backend and still be using “Gmail.” And with that confusion dispelled, let’s take a look at the common email protocols you'll run into using email clients or mobile phones.

**We conclude this discussion by stating the following:**

Email is a message that is sent electronically and then, once you check your email, is downloaded directly to your computer via an email program such as Outlook or Eudora. POP (Post Office Protocol) is the standard protocol for receiving email and is built in to most popular email products. Web Mail is a message that is sent electronically, but when you check your email, your message remains stored on the server. Web mail accounts are accessed through a Web page and have fewer features and less functionality than POP accounts. Hotmail and Yahoo are good examples of Web mail. Web mail accounts are very useful if you travel a lot, as they can be accessed from any computer. Some Web hosts offer both types of services, which means when you’re at your home or office you can use the POP-type service, and when you’re on the road, you can access your emails via the Internet.
BROWSING THE WWW

Web browsers: Surfing (using) the web is made possible by Web browsers. Browsers are basically software programs that allow you to search for and view various kinds of information on the Web, such as web sites, video, audio, etc.

As a client/server model, the browser is the client run on a computer that contacts the Web server and requests information. The Web server sends the information back to the Web browser which displays the results on the computer or other Internet-enabled device that supports a browser.

Today's browsers are fully-functional software suites that can interpret and display HTML Web pages, applications, JavaScript, AJAX and other content hosted on Web servers. Many browsers offer plug-ins which extend the capabilities of a browser so it can display multimedia information (including sound and video), or the browser can be used to perform tasks such as videoconferencing, to design web pages or add anti-phishing filters and other security features to the browser.

The first web browser was invented in 1990 by Sir Tim Berners-Lee. It was called World Wide Web and was later renamed Nexus.

Opera debuted in 1996; it has never achieved widespread use, having less than 2% browser usage share as of February 2012 according to Net Applications. Its Opera-mini version has an additive share, in April 2011 amounting to 1.1% of overall browser use, but focused on the fast-growing mobile phone web browser market, being preinstalled on over 40 million phones. It is also available on several other embedded systems, including Nintendo's Wii video game console.

In 1998, Netscape launched what was to become the Mozilla Foundation in an attempt to produce a competitive browser using the open source software model. That browser would eventually evolve into Firefox, which developed a respectable following while still in the beta stage of development; shortly after the release of Firefox 1.0 in late 2004, Firefox (all versions) accounted for 7% of browser use. As of August 2011, Firefox has a 28% usage share.
Apple's Safari had its first beta release in January 2003; as of April 2011, it had a dominant share of Apple-based web browsing, accounting for just over 7% of the entire browser market.

The most recent major entrant to the browser market is Chrome, first released in September 2008. Chrome's take-up has increased significantly year by year, by doubling its usage share from 8% to 16% by August 2011. This increase seems largely to be at the expense of Internet Explorer, whose share has tended to decrease from month to month. In December 2011, Chrome overtook Internet Explorer 8 as the most widely used web browser but still has lower usage than all versions of Internet Explorer combined.

Function of web browser

The primary purpose of a web browser is to bring information resources to the user (“retrieval” or “fetching”), allowing them to view the information (“display”, “rendering”), and then access other information (“navigation”, “following links”).

This process begins when the user inputs a Uniform Resource Locator (URL), for example http://en.wikipedia.org/, into the browser. The prefix of the URL, the Uniform Resource Identifier or URI, determines how the URL will be interpreted. The most commonly used kind of URI starts with http: and identifies a resource to be Retrieved over the Hypertext Transfer Protocol (HTTP). Many browsers also support a variety of other prefixes, such as https: for HTTPS, ftp: for the File Transfer Protocol, and file: for local files. Prefixes that the web browser cannot directly handle are often handed off to another application entirely. For example, mailto: URIs are usually passed to the user's default e-mail application, and news: URIs are passed to the user's default newsgroup reader.

In the case of http, https, file, and others, once the resource has been Retrieved the web browser will display it. HTML and associated content (image files, formatting information such as CSS, etc.) is passed to the browser's layout engine to be transformed from markup to an interactive document, a process known as “rendering”. Aside from HTML, web browsers can generally display any kind of content that can be part of a web page. Most browsers can display images, audio, video, and XML files, and often have plug-ins to support Flash applications and Java applets. Upon encountering a file of an unsupported type or a file that is set up to be downloaded rather than displayed, the browser prompts the user to save the file to disk.

Information resources may contain hyperlinks to other information resources. Each link contains the URI of a resource to go to. When a link is clicked, the browser navigates to the resource indicated by the link's target URI, and the process of bringing content to the user begins again.

Features of web browsers

Available web browsers range in features from minimal, text-based user interfaces with bare-bones support for HTML to rich user interfaces supporting a wide variety of file formats and protocols. Browsers which include additional components to support e-mail, Usenet news, and Internet Relay Chat (IRC), are sometimes referred to as “Internet suites” rather than merely “web browsers”.

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All major web browsers allow the user to open multiple information resources at the same time, either in different browser windows or in different tabs of the same window. Major browsers also include pop-up blockers to prevent unwanted windows from “popping up” without the user's consent.

Most web browsers can display a list of web pages that the user has bookmarked so that the user can quickly return to them. Bookmarks are also called “Favorites” in Internet Explorer. In addition, all major web browsers have some form of built-in web feed aggregator. In Firefox, web feeds are formatted as “live bookmarks” and behave like a folder of bookmarks corresponding to recent entries in the feed. In Opera, a more traditional feed reader is included which stores and displays the contents of the feed. Furthermore, most browsers can be extended via plug-ins, downloadable components that provide additional features.

**Popular Web Browsers**

Microsoft's Internet Explorer: Most Internet users are using Internet Explorer because it's easy to use and most Web sites are written with Internet Explorer in mind, meaning that they are compatible.

Google Chrome is a browser that combines a minimal design with sophisticated technology to make the web faster, safer, and easier.

Mozilla's Firefox: Firefox is rapidly gaining ground right behind Internet Explorer because of its tabbed browsing, superior security features, and fast load.

Mac Safari: Specifically for Mac users, Safari is an excellent choice for a Web browser, with fast load and good compatibility with most websites out there.

Opera: Opera is another popular browser that's easy to use; however, it can have some compatibility issues with various websites.

**Components of a Web Browser**

We all know what a Web browser looks like, but it's good to have a complete breakdown of the various parts of most Web browsers just for reference's sake. The parts of a browser include:

- **Status bar**: This is the box at the bottom of your browser window. The status bar displays all sorts of information, depending on what you're doing at the time, but mostly it's for showing load speed and the URL of whatever address your mouse is hovering over.
- **Address bar**: This is the box at the top of your browser window that displays the entire URL, or Web site address.
- **Title bar**: The title bar is at the very top of your browser window; in both Firefox and Internet Explorer it is the blue bar there at the top. You'll see the title of the Web page there;
for example, you should see “What Is A Web Browser?” at the top of your browser window right now.

- **Toolbar Icons**: The toolbar and its icons are at the top of your browser window right underneath the Title Bar. This is where you'll see the Back button, the Home button, the Refresh button, etc.

- **Display Window**: The Display Window is just a fancy term for your browser work space; it's the frame through which you see this website right now.

- **Scroll Bars**: If you've ever been to a website that you had to “scroll down” to read something, then you've used the scroll bars. They're just navigational/directional aids.

**Browsing the Internet - Browsing webpages**

When you browse webpages using VoiceOver, you can hear a summary of webpage statistics that tells you how many headers, links, tables, and more are on the page. This information can help you assess the scope and structure of the webpage and navigate in ways that best suit the webpage.

**Ways to navigate:**

- You can choose a default navigation mode, by Document Object Model (DOM) or by grouping related items. You can switch between modes to use the one that works best for the current webpage.

Navigating webpages using DOM or group mode

- You can use the Web Item rotor to quickly jump to links, headers, web spots, tables, and more on a webpage.

Navigating webpages using the Web Item rotor

- If you're using VoiceOver gestures, you can use the web settings of the gestures rotor to navigate webpages more easily.

Using rotor settings with gestures

- With Quick Nav, you can navigate webpages and applications using only the arrow keys.

Navigating using Quick Nav

- As VoiceOver opens a webpage, it evaluates the visual design and creates web spots to mark locations on the page. You can jump from one web spot to another, hearing the beginning of the content in each web spot, essentially scanning the webpage for content of interest. You can create your own web spots to mark favorite locations on a webpage and navigate there more quickly.

**Downloading from and uploading to the Internet**
A **download** involves the receipt of a file copied from a remote network location. Often, a person downloads files to their personal computer from a remote server computer. In Microsoft email networks, for example, people download their email from an Exchange server to their Outlook client.

An **upload** involves sending a copy of a file to a remote network location. For example, Web publishers upload files to their Web server.

Sending files across a computer network does not necessarily constitute an upload or a download. The terms are more commonly used in client/server networking than in peer-to-peer networking.

“**Uploading**” and “**downloading**” are terms used to refer to types of electronic data transfers. The difference between them is the direction in which the files are being transferred. Files are considered to be uploaded when they are transferred from a computer or other electronic device to a central server, and downloading is when the files are transferred from a server to a smaller peripheral unit, such as a computer, smartphone or other device. These two different types of transfers are often done via the Internet, such as when a file is downloaded from a website. The transfer of data from one system or device to a similar system or device, such as from a desktop computer to a laptop, usually is not considered uploading or downloading.

While downloading is receiving a file from another computer, uploading is the exact opposite. It is sending a file from your computer to another system. Pretty straightforward. It is possible to upload and download at the same time, but it may cause slower transfer speeds, especially if you have a low bandwidth connection. Because most files are located on Internet servers, people generally do a lot more downloading than uploading.

**Uploading**

The most common type of uploading is when a user uploads a digital file to an Internet site. For example, a user might upload vacation photos to a social networking website or a home video to a video sharing site. The uploaded files are then stored on the website’s servers and can be seen by anyone who has Internet access and, if necessary, the right software for viewing it.

Other websites allow users to upload digital files for storage. This can allow users to store more files or larger files than would be possible to store on their own computer or device because of its limited storage capacity. Uploading files to storage websites also allows other users or other devices to have access to them. Permission to access the files can be granted to only certain people, or the files could be made public for anyone to access.

Another type of uploading takes place within a closed computer system, such as one within a single office building or one that connects a group of businesses. These types of systems typically have servers to store information that needs to be shared among multiple computers or devices. Digital files can be uploaded from any computer or device that is connected to the system, then can be downloaded or accessed by any other user in the system.
Downloading

Whenever electronic files or information are transferred from a central system to a computer or device that is connected to that system, it is considered downloading. Files can be downloaded temporarily and then deleted after they have been used once, or they can be downloaded on a more permanent basis and used for a long period of time. For example, a funny video file might be downloaded from the Internet and soon deleted after it has been watched, but a helpful application might be downloaded and used for months or years.

Downloaded files are sometimes automatically stored in a particular location on the computer or device, and they are automatically accessed from that location when needed. An example of this is an application that is downloaded to a smartphone — the user typically cannot control where the app is stored on the phone, it is simply stored where the phone stores all of its apps. In other cases, the user can choose where the downloaded files will be stored. For example, a laptop user might download a music file to a specific folder for music or another type of file to the computer's desktop, where it can be found quickly.

Download manager: A download manager is a computer program dedicated to the task of downloading (and sometimes uploading) possibly unrelated stand-alone files from (and sometimes to) the Internet for storage. Some download managers can also be used to accelerate download speeds by downloading from multiple sources at once.

Features
There are several things that some web browsers are not very good at. That's where the download managers enter the equation:

- Pausing the downloading of large files.
- Resuming broken or paused downloads (especially for very large files).
- Downloading files on poor connections.
- Downloading several files from a site automatically according to simple rules (file types, updated files, etc. - see also Offline Browser).
- Automatic recursive downloads (mirroring).
- Scheduled downloads (including, automatic hang-up and shutdown).
- Searching for mirror sites, and the handling of different connections to download the same file more quickly (Segmented downloading).

Download managers are useful for active Internet users. For dial-up users, they can automatically dial the internet service provider at night, when rates or tariffs are usually lower, download the specified files, and hang-up. They can record which links the user clicks on during the day, and queue these files for later download. For broadband users, download managers can help download very large files by resuming broken downloads, by limiting the download capacity used, so that the user's browsing is not affected much and the server is not overloaded, or by automatically browsing a site and downloading content specified by user (photo galleries, MP3 collections, etc.), including automatically downloading whole sites and regularly updating them.
While download managers are designed to give users greater control over downloads, some downloaders are created to give that control to content distributors instead. Some software companies, for example Adobe, provide such downloaders for downloading software on their own site. Presumably this increases reliability and reduces tech support costs to them. A possible reason is increasing the control over redistribution of their software (even when the software is freeware).

Popular download managers include FlashGet, DownThemAll, Free Download Manager, Download Statusbar Firefox Extension, Orbit Downloader, GetGo Download Manager

**Internet Glossary**

**Modem**: Short for MODulator/DEModulator. The Modem is a hardware device that enables a computer to send and receive information over telephone lines by converting the digital data used by your computer into an analog signal used on phone lines and then converting it back once received on the other end. The first Modem was first released by AT&T in 1960 when it introduced its dataphone.

![Modem Image]

Four available versions of a computer Modem that can be used in computers.

- **Internal modem** that connects to a PCI slot inside a newer desktop computer or ISA slot on an older computer.
- **External modem** is located within a box and is hooked up externally to the computer, usually the Serial Ports or USB port.
- **Removable modem** that is used with older laptops PCMCIA slot and is removed when you need the PCMCIA slot for another device, but are not planning on using the modem.
- **Wireless modem** has the capability to connect to the Internet without a cable connection.

**Internet Service Provider**: In order to connect to the Internet, you need an ISP. It is the company that you (or your parents) pay a monthly fee to in order to use the Internet. If you use a dial-up modem to connect to your ISP, a point-to-point protocol (PPP) connection is established with another modem on the ISP's end. That modem connects to one of the ISP's routers, which routes you to the Internet “backbone.” From there, you can access information from anywhere around the world. DSL and cable modems work the same way, except after you connect the first time, you are always connected.

**IP Address**: Also known as an “IP number” or simply an “IP,” this is a code made up of numbers separated by three dots that identifies a particular computer on the Internet. Every computer, whether it be a Web server or the computer you're using right now, requires an IP address to connect to the Internet. IP addresses consist of four sets of numbers from 0 to 255, separated by three dots. For example "66.72.98.236" or "216.239.115.148". Your Internet Service Provider (ISP), will assign you either a static IP address (which is always the same) or a dynamic IP address, (which changes everytime you log on).
**Router:** A router is a small box that allows multiple computers to join the same network. While early routers provided several Ethernet ports for wired connections, most modern routers offer wireless connectivity as well. These "wireless routers" often have one or two moveable antennas on the sides, though some models house the antennas inside the enclosure. Wireless routers allow multiple computers and other devices, such as smartphones and tablets, to join the same network.

While connecting to a router provides access to a local network (LAN), it does not necessarily provide access to the Internet. In order for devices on the network to connect to the Internet, the router must be connected to a modem. Therefore, most routers have a specific Ethernet port that is designed to connect to the Ethernet port of a cable or DSL modem.

**ADSL:** Asymmetric Digital Subscriber Line is a technology for transmitting digital information at a high bandwidth on existing phone lines to homes and businesses. ADSL is asymmetric in the sense that it uses most of the channel to transmit downstream to the user and only a small part to receive information from the user. This means, high download rates and slower upload rates. Generally if you see 2Mb ADSL broadband, it refers to 2 Mbit/s Max d/load rate. The upload rate will probably be around 256 kbit/s Max. (ADSL has a maximum download rate of 8 Mbit/s, ADSL2 is capable of up to 16 Mbit/s and ADSL2+ is rated at 24 Mbit/s maximum.)

**Dial-up:** A method of connection to the internet using existing copper phone lines using a modem on the client's end to send information at a slow speed, normally reaching maximum speed at about 56 kbit/s. This technology uses the voice spectrum of the telephone lines to transmit data using a system of sounds that only the receiving modem or ISP understand.

**Broadband:** Broadband is “a high-speed, high-capacity transmission medium that can carry signals from multiple independent network carriers. This is done on a single coaxial or fiber-optic cable by establishing different bandwidth channels. Broadband technology can support a wide range of frequencies. It is used to transmit data, voice and video over long distances simultaneously.”

**FTP:** File Transfer Protocol - Protocol to exchange files between two computers. FTP is used to transfer files between computers on a network. You can use FTP to exchange files between computer accounts, transfer files between an account and a desktop computer, or access online software archives. Keep in mind, however, that many FTP sites are heavily used and require several attempts before connecting.

**HTML:** Hyper Text Markup Language, the coding language used to create hypertext documents for the World Wide Web. In HTML, a block of text can be surrounded with tags that indicate how it should appear (for example, in bold face or italics). Also, in HTML a word, a block of text, or an image can be linked to another file on the Web. HTML files are viewed with a World Wide Web browser.

**HYPERTEXT:** On the World Wide Web, the feature, built into HTML, that allows a text area, image, or other object to become a “link” (as if in a chain) that retrieves another computer file (another Web page, image, sound file, or other document) on the Internet. The range of possibilities is limited by the ability of the computer retrieving the outside file to view, play, or otherwise open the incoming file. It needs to have software that can interact with the imported file. Many software capabilities of this type are built into browsers or can be added as “plug-ins.”
**PLUG-IN:** An application built into a browser or added to a browser to enable it to interact with a special file type (such as a movie, sound file, Word document, etc.)

**SERVER, WEB SERVER:** A computer running that software, assigned an IP address, and connected to the Internet so that it can provide documents via the World Wide Web. Also called HOST computer. Web servers are the closest equivalent to what in the print world is called the “publisher” of a print document. An important difference is that most print publishers carefully edit the content and quality of their publications in an effort to market them and future publications. This convention is not required in the Web world, where anyone can be a publisher; careful evaluation of Web pages is therefore mandatory. Also called a “Host.”

**SPIDERS:** Computer robot programs, referred to sometimes as “crawlers” or “knowledge-bots” or “knowbots” that are used by search engines to roam the World Wide Web via the Internet, visit sites and databases, and keep the search engine database of web pages up to date. They obtain new pages, update known pages, and delete obsolete ones. Their findings are then integrated into the “home” database.

**TCP/IP:** (Transmission Control Protocol/Internet Protocol) -- This is the suite of protocols that defines the Internet. Originally designed for the UNIX operating system, TCP/IP software is now available for every major kind of computer operating system. To be truly on the Internet, your computer must have TCP/IP software.

**Spamming:** The act of sending unsolicited email or posting many useless messages in a forum website. (Possibly derived from a Monty Python sketch, in which Vikings repetitively sing about SPAM, annoying the other customers.

**Phishing:** The act of sending an e-mail to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft. The e-mail directs the user to visit a Web site where they are asked to update personal information, such as passwords and credit card, social security, and bank account numbers, that the legitimate organization already has. The Web site, however, is bogus and set up only to steal the user's information.

**Bookmarks/Favourites:** All major web browsers include a way to store links to sites you wish to return to. Netscape, Mozilla, and Firefox use the term Bookmarks. The equivalent in Internet Explorer (IE) is called a “Favorite.”

To create a bookmark, click on BOOKMARKS or FAVORITES, then ADD. Or left-click on and drag the little bookmark icon to the place you want a new bookmark filed. To visit a bookmarked site, click on BOOKMARKS and select the site from the list. Most browsers also include commands to Import and Export lists of bookmarks.

**Boolean logic:** A system of standardized words (“operators”) used to connect search terms. These include AND, OR, NOT and sometimes NEAR. AND requires all terms appear in a record. OR retrieves records with either term. NOT excludes terms. Parentheses may be used to sequence operations and group words. Always enclose terms joined by OR with parentheses.
**Cookie**: A message from a WEB SERVER computer, sent to and stored by your browser on your computer. When your computer consults the originating server computer, the cookie is sent back to the server, allowing it to respond to you according to the cookie's contents. The main use for cookies is to provide customized Web pages according to a profile of your interests. When you log onto a “customize” type of invitation on a Web page and fill in your name and other information, this may result in a cookie on your computer which that Web page will access to appear to “know” you and provide what you want. If you fill out these forms, you may also receive e-mail and other solicitation independent of cookies.

**URL**: Uniform Resource Locator. The unique address of any Web document. May be keyed in a browser's OPEN or LOCATION / GO TO box to retrieve a document. There is a logic the layout of a URL:

**Domain name, domain name server (dns)entry**: Any of these terms refers to the initial part of a URL, down to the first /, where the domain and name of the host or SERVER computer are listed (most often in reversed order, name first, then domain). The domain name gives you who “published” a page, made it public by putting it on the Web.

A domain name is translated in huge tables standardized across the Internet into a numeric IP address unique the host computer sought. These tables are maintained on computers called “Domain Name Servers.” Whenever you ask the browser to find a URL, the browser must consult the table on the domain name server that particular computer is networked to consult.

**Malware, Viruses, Worms, Trojans etc:**

Viruses, worms, Trojans, and bots are all part of a class of software called malware. Malware or malicious code (malcode) is short for malicious software. It is code or software that is specifically designed to damage, disrupt, steal, or in general inflict some other “bad” or illegitimate action on data, hosts, or networks.

There are many different classes of malware that have varying ways of infecting systems and propagating themselves. Malware can infect systems by being bundled with other programs or attached as macros to files. Others are installed by exploiting a known vulnerability in an operating system (OS), network device, or other software, such as a hole in a browser that only requires users to visit a website to infect their computers. The vast majority, however, are installed by some action from a user, such as clicking an e-mail attachment or downloading a file from the Internet.

Some of the more commonly known types of malware are viruses, worms, Trojans, bots, back doors, spyware, and adware. Damage from malware varies from causing minor irritation (such as browser popup ads), to stealing confidential information or money, destroying data, and compromising and/or entirely disabling systems and networks.

Malware cannot damage the physical hardware of systems and network equipment, but it can damage the data and software residing on the equipment. Malware should also not be confused with defective software, which is intended for legitimate purposes but has errors or bugs.

Classes of Malicious Software: Two of the most common types of malware are viruses and worms. These types of programs are able to self-replicate and can spread copies of themselves,
which might even be modified copies. To be classified as a virus or worm, malware must have
the ability to propagate. The difference is that a worm operates more or less independently of
other files, whereas a virus depends on a host program to spread itself. These and other classes
of malicious software are described below.

Viruses: A computer virus is a type of malware that propagates by inserting a copy of itself into
and becoming part of another program. It spreads from one computer to another, leaving
infections as it travels. Viruses can range in severity from causing mildly annoying effects to
damaging data or software and causing denial-of-service (DoS) conditions. Almost all viruses
are attached to an executable file, which means the virus may exist on a system but will not be
active or able to spread until a user runs or opens the malicious host file or program. When the
host code is executed, the viral code is executed as well. Normally, the host program keeps
functioning after it is infected by the virus. However, some viruses overwrite other programs
with copies of themselves, which destroys the host program altogether. Viruses spread when the
software or document they are attached to is transferred from one computer to another using the
network, a disk, file sharing, or infected e-mail attachments.

Worms: Computer worms are similar to viruses in that they replicate functional copies of
themselves and can cause the same type of damage. In contrast to viruses, which require the
spreading of an infected host file, worms are standalone software and do not require a host
program or human help to propagate. To spread, worms either exploit a vulnerability on the
target system or use some kind of social engineering to trick users into executing them. A worm
enters a computer through a vulnerability in the system and takes advantage of file-transport or
information-transport features on the system, allowing it to travel unaided.

Trojans: A Trojan is another type of malware named after the wooden horse the Greeks used to
infiltrate Troy. It is a harmful piece of software that looks legitimate. Users are typically tricked
into loading and executing it on their systems. After it is activated, it can achieve any number of
attacks on the host, from irritating the user (popping up windows or changing desktops) to
damaging the host (deleting files, stealing data, or activating and spreading other malware, such
as viruses). Trojans are also known to create back doors to give malicious users access to the
system.

Unlike viruses and worms, Trojans do not reproduce by infecting other files nor do they self-
replicate. Trojans must spread through user interaction such as opening an e-mail attachment or
downloading and running a file from the Internet.

Bots: "Bot" is derived from the word "robot" and is an automated process that interacts with
other network services. Bots often automate tasks and provide information or services that
would otherwise be conducted by a human being. A typical use of bots is to gather information
(such as web crawlers), or interact automatically with instant messaging (IM), Internet Relay
Chat (IRC), or other web interfaces. They may also be used to interact dynamically with
websites.
Spyware: Spyware is any software installed on your PC that collects your information without your knowledge, and sends that information back to the creator so they can use your personal information in some nefarious way. This could include keylogging to learn your passwords, watching your searching habits, changing out your browser home and search pages, adding obnoxious browser toolbars, or just stealing your passwords and credit card numbers.

Scareware: Scareware is a relatively new type of attack, where a user is tricked into downloading what appears to be an antivirus application, which then proceeds to tell you that your PC is infected with hundreds of viruses, and can only be cleaned if you pay for a full license. Of course, these scareware applications are nothing more than malware that hold your PC hostage until you pay the ransom—in most cases, you can't uninstall them or even use the PC.

Firewall: Connecting a computer to the internet makes it visible to every other computer on the network, and the opportunity for remote misuse this presents is huge. A firewall sits between a computer and the network to control which computers can connect to it and what services they can use. A firewall is a software program or piece of hardware that helps screen out hackers, viruses, and worms that try to reach your computer over the Internet. A firewall is a system designed to prevent unauthorized access to or from a private network. You can implement a firewall in either hardware or software form, or a combination of both. Firewalls prevent unauthorized Internet users from accessing private networks connected to the Internet, especially intranets. All messages entering or leaving the intranet (i.e., the local network to which you are connected) must pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.

B: ONLINE SHOPPING AND E-BUSINESS/E-COMMERCE

The difference between e-Business and e-Commerce

Electronic commerce or “e-Commerce” covers the range of on-line business activities for products and services, both business-to-business and business-to-consumer, through the Internet. E-Commerce breaks into two components:

(a) Online Shopping - the scope of information and activities that provides the customer with the information they need to conduct business with you and make an informed buying decision.

(b) Online Purchasing - the technology infrastructure for the exchange of data and the purchase of a product over the Internet. Online purchasing is a metaphor used in business-to-business e-Commerce for providing customers with an online method of placing an order, submitting a purchase order, or requesting a quote.

When you review information on products or services on the Internet, you are carrying out online shopping. While online shopping you may find a product you want to purchase, you place it in an online shopping cart. When you are done shopping and are ready to buy, you click a purchase button. You are then moved to a secure location to carry out online purchasing on the product. To complete the transaction, you need to supply your shipping address and credit card...
number. These are the fundamental processes of online shopping and online purchasing. These processes are the actions that are referred to as e-Commerce.

**e-Business** is a super-set of eCommerce. One component of transitioning your company from a traditional business to an eBusiness is when you incorporate eCommerce into your company's flow. For example, when your sales and fulfillment organizations can handle web-based purchases equivalently to telephone and mail purchases, you have started the transition to e-Business.

Many companies have an eCommerce site but are not yet an e-Business. eCommerce is the online selling component of a web site. E-Business is the integration of a company's activities including products, procedures, and services with the Internet. You turn your company from a business into an e-Business when you integrate your sales, marketing, accounting, manufacturing, and operations with your web site activities. An e-Business uses the Internet as fully integrated channel for all business activities.

**E-COMMERCE**

Electronic commerce (ecommerce) is the application of communication and information sharing technologies among trading partners to the pursuit of business objectives. eCommerce can be defined as a modern business methodology that addresses the needs of organizations, merchants, and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery. E-commerce refers to business that is conducted over the Internet using any of the applications that rely on the Internet, such as e-mail, instant messaging, shopping carts, Web services, UDDI, FTP, and EDI, among others. E-commerce is associated with the buying and selling of information, products and services via computer networks. Key element of e-commerce is information processing. The effects of e-commerce are already appearing in all areas of business, from customer service to new product design. It facilitates new types of information based business processes for reaching and interacting with customers – online advertising and marketing, online order taking and on-line customer service etc. It can also reduce costs in managing orders and interacting with a wide range of suppliers and trading partners, areas that typically add significant overhead to the cost of products and services. Also E-commerce enables the formation of new types of information-based products such as interactive games, electronic books, and information-on-demand that can be very profitable for content providers and useful for consumers. Virtual enterprises are business arrangements in which trading partners separated by geography and expertise are able to engage in complex joint business activities, as if they were a single enterprise. One example would be true supply chain integration, where planning and forecast data are transmitted quickly and accurately throughout a multi-tier supply chain. Another example would be non-competing suppliers with a common customer using E-commerce to allow that customer to do “one stop shopping” with the assurance that a single phone call will bring the right materials to the right location at the right time.
TYPES OF E-COMMERCE

The following three strategies are the focal points for E-Commerce

Ecommerce (e-commerce) or electronic commerce, a subset of ebusiness, is the purchasing, selling, and exchanging of goods and services over computer networks (such as the Internet) through which transactions or terms of sale are performed electronically. Contrary to popular belief, ecommerce is not just on the Web. In fact, ecommerce was alive and well in business to business transactions before the Web back in the 70s via EDI (Electronic Data Interchange) through VANs (Value-Added Networks). Ecommerce can be broken into four main categories: B2B, B2C, C2B, and C2C.

(1) B2B (Business-to-Business): Companies doing business with each other such as manufacturers selling to distributors and wholesalers selling to retailers. Pricing is based on quantity of order and is often negotiable.

(2) B2C (Business-to-Consumer): Businesses selling to the general public typically through catalogs utilizing shopping cart software. By dollar volume, B2B takes the prize, however B2C is really what the average Joe has in mind with regards to ecommerce as a whole.

(3) C2B (Consumer-to-Business): A consumer posts his project with a set budget online and within hours companies review the consumer's requirements and bid on the project. The consumer reviews the bids and selects the company that will complete the project. Elance empowers consumers around the world by providing the meeting ground and platform for such transactions.

(4) C2C (Consumer-to-Consumer): There are many sites offering free classifieds, auctions, and forums where individuals can buy and sell thanks to online payment systems like PayPal where people can send and receive money online with ease. eBay's auction service is a great example of where person-to-person transactions take place everyday since 1995.
Companies using internal networks to offer their employees products and services online—not necessarily online on the Web—are engaging in B2E (Business-to-Employee) ecommerce.

(5) G2G (Government-to-Government), G2E (Government-to-Employee), G2B (Government-to-Business), B2G (Business-to-Government), G2C (Government-to-Citizen), C2G (Citizen-to-Government) are other forms of ecommerce that involve transactions with the government—from procurement to filing taxes to business registrations to renewing licenses. There are other categories of ecommerce out there, but they tend to be superfluous.

TECHNOLOGIES OF E-COMMERCE

While many technologies can fit within the definition of “Electronic commerce,” the most important are:

1. Electronic data interchange (EDI)
2. Bar codes
3. Electronic mail
4. Internet
5. World Wide Web
6. Product data exchange
7. Electronic forms

Electronic data interchange (EDI) is the computer-to-computer exchange of structured business information in a standard electronic format. Information stored on one computer is translated by software programs into standard EDI format for transmission to one or more trading partners. The trading partners’ computers, in turn, translate the information using software programs into a form they can understand.

Bar Codes: Bar codes are used for automatic product identification by a computer. They are a rectangular pattern of lines of varying widths and spaces. Specific characters (e.g. numbers 0-9) are assigned unique patterns, thus creating a “font” which computers can recognize based on light reflected from a laser.

The most obvious example of bar codes is on consumer products such as packaged foods. These codes allow the products to be scanned at the check out counter. As the product is identified the price is entered in the cash register, while internal systems such as inventory and accounting are automatically updated.

The special value of a bar code is that objects can be identified at any point where a stationary or hand held laser scanner could be employed. Thus the technology carries tremendous potential to improve any process requiring tight control of material flow. Good examples would be shipping, inventory management, and work flow in discrete parts manufacturing.
**Electronic Mail:** Messages composed by an individual and sent in digital form to other recipients via the Internet.

**Internet:** The Internet is a decentralized global network of millions of diverse computers and computer networks. These networks can all “talk” to each other because they have agreed to use a common communications protocol called TCP/IP. The Internet is a tool for communications between people and businesses. The network is growing very, very fast and as more and more people are gaining access to the Internet, it is becoming more and more useful.

**World Wide Web:** The World Wide Web is a collection of documents written and encoded with the Hypertext Markup Language (HTML). With the aid of a relatively small piece of software (called a “browser”), a user can ask for these documents and display them on the user’s local computer, although the document can be on a computer on a totally different network elsewhere in the world. HTML documents (or “pages,” as they are called) can contain many different kinds of information such as text, pictures, video, sound, and pointers, which take users immediately to other web pages. Because Web pages are continually available through the Internet, these pointers may call up pages from anywhere in the world. It is this ability to jump from site to site that gave rise to the term “World Wide Web.” Browsing the Web (or “surfing the Net”) can be a fascinating activity, especially to people new to the Internet. The World Wide Web is by far the most heavily used application on the Internet.

**Product Data Exchange:** Product data refers to any data that is needed to describe a product. Sometimes that data is in graphical form, as in the case of pictures, drawings and CAD files. In other cases the data may be character based (numbers and letters), as in the case of specifications, bills of material, manufacturing instructions, engineering change notices and test results.

Product data exchange differs from other types of business communications in two important ways. First, because graphics are involved users must contend with large computer files and with problems of compatibility between software applications. (The difficulty of exchanging CAD files from one system to another is legendary.) Second, version control very quickly gets very complicated. Product designs, even late in the development cycle, are subject to a great deal of change, and because manufacturing processes are involved, even small product changes can have major consequences for getting a product into production.

**Electronic Forms:** Electronic forms is a technology that combines the familiarity of paper forms with the power of storing information in digital form. Imagine an ordinary paper form, a piece of paper with lines, boxes, check-off lists, and places for signatures. To the user an electronic form is simply a digital analogue of such a paper form, an image, which looks like a form but which appears on a computer screen and is filled out via mouse, and keyboard. Behind the screen, however, lie numerous functions that paper and pencil cannot provide. Those extra functions come about because the data from electronic forms are captured in digital form, thus allowing storage in data bases, automatic information routing, and integration into other applications.

**Systems of payments in e-commerce**

E-commerce is rife with buzzwords and catchphrases. Here are some of the current terms people like to throw around:
1 Credit card-based: If consumers want to purchase a product or service, they simply send their credit card details to the service provider involved and the credit card organization will handle this payment like any other.

2 Smart cards: These are credit and debit cards and other card products enhanced with microprocessors capable of holding more information than the traditional magnetic stripe. The chip can store significantly greater amounts of data, estimated to be 80 times more than a magnetic stripe. Smart cards are basically of two types:

3 Digital or electronic cash: Also called e-cash, these terms refer to any of several schemes that allow a person to pay for goods or services by transmitting a number from one computer to another. The numbers, just like those on a dollar bill, are issued by a bank and represent specified sums of real money. One of the key features of digital cash is that it's anonymous and reusable, just like real cash. This is a key difference between e-cash and credit card transactions over the Internet.

4 Electronic checks: Currently being tested by Cybercash, electronic checking systems such as PayNow take money from users' checking accounts to pay utility and phone bills.

5 Electronic wallet: This is a payment scheme, such as Cybercash’s Internet Wallet, that stores your credit card numbers on your hard drive in an encrypted form. You can then make purchases at Web sites that support that particular electronic wallet. When you go to a participating online store, you click a Pay button to initiate a credit card payment via a secure transaction enabled by the electronic wallet company's server. The major browser vendors have struck deals to include electronic wallet technology in their products.

6 Electronic purses: These are wallet-sized smart cards embedded with programmable microchips that store sums of money for people to use instead of cash for everything from buying food to paying subway fares.

7 COD – cash on delivery: Pay cash at the time of delivery of goods

Advantages of E-commerce

1 Lower Cost

Doing e-business is cost effective; it reduces logistical problems and puts a small business on a par with giants such as Amazon.com or General Motors. In a commercial bank, for example, a basic over-the-counter transaction costs £0.50 to process; over the Internet, the same transaction costs about £0.01. Every financial transaction eventually turns into an electronic process. The sooner it makes the conversion, the more cost-effective the transaction becomes.

2 Economy

Unlike the normal shopping malls, in e–commerce there is no physical store space, insurance, or infrastructure investment. All you need is an idea, a unique product, and a well–designed web storefront to reach your customers, plus a partner to do fulfillment. This makes e–commerce a lot more economical.
(3) Higher Margins

E–commerce means higher margins. For example, the cost of processing an airline ticket is £5. According to one travel agency, processing the same ticket online costs £1. Along with higher margins, businesses can gain more control and flexibility and are able to save time when manual transactions are done electronically.

(4) Better Customer Service

E–commerce means better and quicker customer service. Online customer service makes customers happier. Instead of calling your company on the phone, the web merchant gives customers direct to their personal account online. This saves time and money. For companies that do business with other companies, adding customer service online is a competitive advantage. The overnight package delivery service, where tracking numbers allow customers to check the whereabouts of a package online, is one good example.

(5) Quick Comparison Shopping

E–commerce helps consumers to comparison shop. Automated online shopping assistants called hopbots scour online stores and find deals on everything from apples to printer ribbons.

(6) Productivity Gains

Weaving the web throughout an organisation means improved productivity. For example IBM incorporated the web into every corner of the firm – products, marketing, and practices. The company figured it would save $750 million by letting customers find answers to technical questions via its website. The total cost savings in 1999 alone was close to $1 billion.

(7) Knowledge Markets

E–commerce helps create knowledge markets. Small groups inside big firms can be funded with seed money to develop new ideas. For example, DaimlerChrysler has created small teams to look for new trends and products. A Silicon Valley team is doing consumer research on electric cars and advising car designers.

(8) Information Sharing, Convenience, And Control

Electronic marketplaces improve information sharing between merchants and customers and promote quick, just–in–time deliveries. Convenience for the consumer is a major driver for changes in various industries. Customers and merchants save money; are online 24 hours a day, 7 days a week; experience no traffic jams, no crowds, and do not have to carry heavy shopping bags.

**Disadvantages of E–commerce**

(1) Security

Security continues to be a problem for online businesses. Customers have to feel confident about the integrity of the payment process before they commit to the purchase.

(2) System and Data Integrity

Data protection and the integrity of the system that handles the data are serious concerns. Computer viruses are rampant, with new viruses discovered every day. Viruses cause unnecessary delays, file backups, storage problems, and other similar difficulties. The danger of hackers accessing files and corrupting accounts adds more stress to an already complex operation.

(3) E–commerce is not free

So far, success stories in e–commerce have forced large business with deep pockets and good funding. According to a report, small retailers that go head–to–head with e–commerce giants
are fighting losing battle. They simply cannot compete on price or product offering. Brand
loyalty is related to this issue, which is supposed to be less important for online firms. Brands
are expected to lower search costs, build trust, and communicate quality. A search engine can
come up with the best music deals, for example, yet consumers continue to flock to trusted
entities such as HMV.

(4) Customer Relations Problems
Not many businesses realise that even e–business cannot survive over the long term without
loyal customers.

(5) There are products people will not buy online
In the case of certain products, say, a sofa, you would want to sit on it, feel the texture of the
fabric etc.

(6) Corporate Vulnerability
The availability of product details, catalogs, and other information about a business through its
website makes it vulnerable to access by the competition. The idea of extracting business
intelligence from the website is called web framing.

(7) High risk of Internet start–up
Many stories unfolded in 1999 about successful executives in established firms leaving for
Internet start–ups, only to find out that their get–rich dream with a dot.com was just that – a
dream.

Online shopping
When you buy a product or a service over the internet, instead of going to a shop, it is called
online shopping. Online shopping or online retailing is a form of electronic commerce which
allows consumers to directly buy goods or services from a seller over the Internet using a web
browser. Alternative names are: e-web-store, e-shop, e-store, Internet shop, web-shop, web-
store, online store, and virtual store. An online shop evokes the physical analogy of buying
products or services at a shopping centre; the process is called business-to-consumer (B2C)
online shopping. In the case where a business buys from another business, the process is
called business-to-business (B2B) online shopping. The largest of these online retailing
corporations are eBay, Amazon.com, Flipkart.com, Yebi.com, Myntra.com, Jabong.com etc.

Online shopping became popular during the Internet boom in 1999-2000. Amazon.com, the
online bookstore founded by Jeff Bezos, created history by becoming the first bookstore with
a presence only on the Internet. Following the success of Amazon, many bookstores with a
physical presence also created an online presence on the Internet. Later, portals such as
Yahoo.com and MSN.com also started online shopping channels where people could buy
more than just books. Indian online shopping sites include flipkart.com, myntra.com,
jabong.com, yebi.com, indiatimesshopping.com etc.

Advantages of online shopping

1) **Convenience:** You do not have to wait in a line or wait till the shop assistant is ready to help
you with your purchases. You can do your shopping in minutes even if you are busy apart from
saving time and avoiding crowds. Online shops give us the opportunity to shop 24 x 7 and also
reward us with a ‘no pollution’ shopping. There is no better place to buy information products
like e-books. Immediately after the payment is made one can download the information. And
downloadable items purchased online eliminate the need for any kind of material goods at all.

2) **Better Prices:** They offer cheap deals and better prices because products come to you direct
from the manufacturer or seller without middlemen involved. Many online shops offer discount
coupons and rebates. Apart from this, the Online Store is only required to collect sales tax if they have a physical location in our state even if we buy from a store across the world.

3) **Variety:** The choices you can get for products are amazing. One can get several brands and products from different sellers at one place. You can get in on the latest international trends without spending money on airfare. When you shop online, you can shop from retailers in other parts of the country or even the world without being limited by geographic area. These stores offer a far greater selection of colours and sizes than you will find locally. Some online shops have a provision to accept orders without stock and ship it across to you when the stock becomes available.

4) **Send Gifts:** Online Shopping makes sending gifts to relatives and friends easy, no matter where ever they stay. Now there is no need of making distance an excuse for not sending a gift on occasions like Birthday, Wedding Anniversary, Marriage, Valentine’s Day, Mother’s Day etc.

5) **Fewer Expenses:** Many times when we opt for conventional shopping we tend to spend a lot more than the required shopping expenses on things like eating out, traveling, impulsive shopping etc.

6) **Comparison of Prices:** Online shops make comparison and research of products and prices possible. Online stores also give you the ability to share information and reviews with other shoppers who have first-hand experience with a product or retailer.

7) **Crowds:** If you would like to avoid the crowds when you do the shopping, e shopping is the best

8) **Compulsive Shopping:** Many times when we go out on Shopping we end up buying things which we do not require because of the shop keepers up selling skills. Sometimes we even compromise on our choices because of the lack of choices in those shops.

9) **Buying old or unused Stuff at low prices:** Online Shops make it possible for us to buy old or unused stuff at rock bottom prices. If we want to buy antiques there is no better options than online stores.

10) **Discreet Purchases:** Online shops are also best for discreet purchases, purchases of private nature like lingerie.

**Disadvantages of online shopping**

1. We cannot receive the product immediately. We have to wait until the product arrives.

2. You do not know about the actual quality of the product. Sometimes the description of the product might be different than the actual product. As a result you might end up with inferior quality product.

3. Shipping charge and shipping delays are one of the main disadvantage of shopping online.

4. Sometime you may face Delivery risk. Delivery risk occurs when the seller fails to deliver the original product or delivers a damaged (inferior/duplicate) product.
5. As online shopping is becoming very common the number of online scam and fraud is also increasing. This is why a buyer should always buy from trusted websites.

6. You wouldn't like to buy any clothing products because you won't be able to know whether they will look good on you or not.

E-cart / electronic shopping cart

An electronic commerce tool (software or service) that is the user-interface for the customer to shop at online stores. It allows users to place items in a “shopping basket”, and the cart remembers these items for a predetermined length of time. Extra features such as different colour or size options, quantity of order, and matching item links can be found linked from the shopping cart. Once a shopper inputs his shipping address, taxes and shipping costs can also be tallied from within the shopping cart. For the merchant, the shopping cart also provides important information, which is often transparent to the shopper including a cart number to track the order, and a cookie to provide you with some limited tracking details about your customer.

E-market

E-marketing means using digital technologies to help sell your goods or services. These technologies are a valuable complement to traditional marketing methods whatever the size of your company or your business model.

The basics of marketing remain the same – creating a strategy to deliver the right messages to the right people. What has changed is the number of options you have. Though businesses will continue to make use of traditional marketing methods, such as advertising, direct mail and PR, e-marketing adds a whole new element to the marketing mix. Many businesses are producing great results with e-marketing and its flexible and cost-effective nature makes it particularly suitable for small businesses.

This guide describes how to develop an e-marketing plan and provides guidance on implementing that plan and monitoring its effectiveness.

The benefits of e-marketing

E-marketing gives businesses of any size access to the mass market at an affordable price and, unlike TV or print advertising, it allows truly personalized marketing. Specific benefits of e-marketing include:

- **Global reach** – a website can reach anyone in the world who has internet access. This allows you to find new markets and compete globally for only a small investment.
- **Lower cost** – a properly planned and effectively targeted e-marketing campaign can reach the right customers at a much lower cost than traditional marketing methods.
- **Track able, measurable results** – marketing by email or banner advertising makes it easier to establish how effective your campaign has been. You can obtain detailed information about customers’ responses to your advertising.
- **24-hour marketing** – with a website your customers can find out about your products even if your office is closed.
• **Personalization** – if your customer database is linked to your website, then whenever someone visits the site, you can greet them with targeted offers. The more they buy from you, the more you can refine your customer profile and market effectively to them.

• **One-to-one marketing** – e-marketing lets you reach people who want to know about your products and services instantly. For example, many people take mobile phones and PDAs wherever they go. Combine this with the personalized aspect of e-marketing, and you can create very powerful, targeted campaigns.

• **More interesting campaigns** – e-marketing lets you create interactive campaigns using music, graphics and videos. You could send your customers a game or a quiz – whatever you think will interest them.

• **Better conversion rate** – if you have a website, then your customers are only ever a few clicks away from completing a purchase. Unlike other media which require people to get up and make a phone call, post a letter or go to a shop, e-marketing is seamless.

Together, all of these aspects of e-marketing have the potential to add up to more sales.

**e-procurement (supplier exchange)**

E-procurement is the business-to-business purchase and sale of supplies and services over the Internet. An important part of many B2B sites, e-procurement is also sometimes referred to by other terms, such as *supplier exchange*. Typically, e-procurement Web sites allow qualified and registered users to look for buyers or sellers of goods and services. Depending on the approach, buyers or sellers may specify prices or invite bids. Transactions can be initiated and completed. Ongoing purchases may qualify customers for volume discounts or special offers.

E-procurement is the term used to describe the use of electronic methods, typically over the Internet to conduct transactions between awarding authorities and suppliers. The process of e-procurement covers every stage of purchasing, from the initial identification of a requirement, through the tendering process, to the payment and potentially the contract management. E-procurement software may make it possible to automate some buying and selling. Companies participating expect to be able to control parts inventories more effectively, reduce purchasing agent overhead, and improve manufacturing cycles. E-procurement is expected to be integrated with the trend toward computerized supply chain management.

E-procurement increased in the second half of 1999, when online auctions and product catalogs became commonplace on the Internet and continued to expand. The convenience online buying offered, even in its infancy, led e-procurement to reach as high as $145 billion in transactions in 1999, according to a 2001 article in “Product Inventory and Management Journal,” by EvgeniyAgeshin. A study by Deloitte Consulting in the fall of 1999 concluded that 85 percent of firms that made use of e-procurement systems were highly satisfied with its benefits. According to Ageshin, e-procurement is still a growing trend, which started with General Electric and Wal-Mart creating buying and selling hubs over the Internet. Internet commerce expanded, as companies like Amazon.com brought together diverse groups of buyers and sellers. Vertical markets (for example, insurance, heavy manufacturing, banking and real estate) have also joined e-procurement consortiums.
Note that E-procurement is the electronic implementation of the procurement cycle, not to be confused with e-sourcing, which is the electronic implementation of the sourcing cycle. It is the technology-enabled acquisition of goods and services required by an organization at the best value obtainable. The goal is the right product or service, at the right place, at the right time, at the right price in the most efficient manner possible.

Procurement is a cycle that consists of up to nine steps, depending on the value and complexity of the buy as well as organizational policies. At a minimum, it starts with need identification (and requisition), proceeds to the generation and delivery of a purchase order (possibly after one or more approvals), and results in the acceptance of an invoice and an eventual (e-) payment. For high dollar and / or more complex purchases, the process will usually include the generation of a goods-receipt or acceptance of labor hours through a time sheet or other mechanism; multi-way matching and reconciliation of the purchase order, goods receipt, and invoice; tax tracking; and rebate request preparation.

E-procurement is important because it saves time, money, and adds value to the traditional procurement process through improved compliance and added visibility:

Requisitioners can also be assured that each supplier in the system meets any regulatory and specification requirements. Finally, e-procurement institutes and enforces best practices that increase spend under management, the ultimate key to procurement savings.

Spend visibility is the best defense against maverick spending as well as the best offense you have to prevent information overload. Remember that negotiated savings are just that -- negotiated savings -- unless all orders are placed against the contract, all invoices paid at contracted rates, and all rebates and discounts collected. Furthermore, if users search the internet to find a product, they will be inundated with potential suppliers, many of which will not be good choices from a total cost of ownership viewpoint. Without good e-procurement systems and processes, chances are that maverick spend is rampant in an organization, even
though it may not be the intent. Maverick spend not only eliminates the negotiated savings the sourcing team worked so hard to deliver, but could even add additional cost above and beyond previous costs.

E-procurement models

(a) activity based model:

Indirect Procurement System (IPS): In this method contracting subject do not coincide with the ordering administration

Direct Procurement System (DPS): In this method contracting subject coincides with the ordering administration

(b) organization based model:

Centralized Model: Here purchasing procedures are centralized

Decentralized Model: Here purchasing procedures depend on each administration unit

Advantages of E-Procurement

(a) The low cost of information and technology courtesy of the Internet is a major advantage of e-procurement. The costs of buying or selling as well as barriers to market entry have significantly been lowered as operation costs are reduced. Prices are more transparent, maverick buying (purchases that occur outside of an organization's guidelines) is avoided, businesses can easily use preferred supplier networks, and there is better balance of power between buyer and seller given that information is much more available.

(b) E-procurement systems also allow more efficient integration of supply chains and provide better organization and tracking of transaction records for easier data acquisition. Transactions can be standardized and all bids for products and services can be tracked more easily, allowing business owners to use such knowledge to obtain better pricing. Due to faster exchanges of information and delivery of goods and services, e-procurement also promotes shorter product-development cycles.

Disadvantages of E-Procurement

(a) Disadvantages of e-procurement are mostly on the side of the supplier. Buyers reap more benefits than suppliers such as shorter ordering cycles, a wider adoption of “just-in-time” practices and increased supplier involvement in product development.

(b) Suppliers face problems such as high training costs, the necessity of dealing with more than one marketplace, higher risk of data compromise and full organizational restructuring in some cases. Some suppliers used to dealing with clients face-to-face may find online transactions uncomfortable, since suppliers don't necessarily know whom they are dealing with online.

(c) Another disadvantage of e-procurement services is rapidly growing multiple standards. Both buyers and suppliers are uncertain of which e-procurement service provider will survive or become obsolete. Multiple standards also add to the confusion about which one to use and may increase costs for the seller as it attempts to fulfill multiple standards.
E-procurement tools and applications
Some e-procurement tools and applications include:

- electronic systems to support traditional procurement
- EDI (electronic data interchange)
- ERP (Enterprise resource planning) systems
- internet as a support or complement to traditional procurement
- electronic mail (e-mail)
- web enabled EDI
- extensible markup language (XML)
- world wide web (www)
- internet tools and platforms that replace traditional procurement

Electronic systems to support traditional procurement
These include mainframes and personal computers (PC), Electronic Data Interchange (EDI) and Enterprise Resource Planning (ERP).

EDI (Electronic Data Interchange)
EDI is an application whereby electronic messages can be exchanged between computer programs of two separate organizations. Some features of EDI include:

- Messages are exchanged in groups, known as batches.
- Messages can automatically be sent, transmitted and stored between computers without retying or keying data.
- EDI has to be implemented by each pair of organizations (sender and receiver) who wish to use it. This means that the implementation costs of EDI are relatively high.
- EDI is mostly used where the messages exchanged concern such matters as orders, confirmations, transport information and invoicing.
- EDI traditionally runs on so-called, “Value Added Networks”, which are closed networks (unlike open networks like the Internet).

ERP systems
Enterprise resource planning (ERP) systems are management information systems that integrate and automate many of the business practices associated with the operations of a company or organization. ERP systems typically handle the manufacturing, logistics, distribution, inventory, shipping, invoicing, and accounting for a company or organization. ERPs aid in the control of many business activities, like sales, delivery, billing, production, procurement, inventory management, and human resources management.

Internet as a support or complement to traditional procurement
There are various types of internet based applications that serve different purposes. Some well-known applications that use the internet are described below:

Electronic mail (e-mail)
Email is an Internet based application through which electronic messages are exchanged between people.
Web enabled EDI
web enabled Edi is like traditional EDI (see above), but run on the Internet; also known as EDI-INT.

Extensible Markup Language (XML)
XML is used to allow for the easy interchange of documents on the World Wide Web.

World Wide Web (WWW)
The WWW is a major service on the Internet. The World Wide Web is made up of “Web servers” that store and disseminate “Web pages,” which are “rich” documents that contain text, graphics, animations and videos to anyone with an Internet connection.

Related Glossary
(a) E-sourcing
E-sourcing is the process of obtaining bids from different suppliers via a single online portal. The benefits of E-sourcing include streamlining the sourcing process, reducing prices by maximizing supplier competition, and creating a repository for sourcing information. E-sourcing supports the specification phase; it can be used to pre-qualify suppliers and also identifies suppliers that can be used in the selection phase. For suppliers the benefit is: “marketing” and for the buying organizations the benefit is facilitating the sourcing of suppliers. The UN Global Market Place (UNGM www.ungm.org) is an example of an E-sourcing tool.

(b) E-tendering
E-tendering supports the selection stage and acts as a communication platform between the procuring organization and suppliers. It covers the complete tendering process from REOI via ITB/RFP to contracting, usually including support for the analysis and assessment activities; it does not include closing the deal with a supplier but facilitates a large part of the tactical procurement process. It results in equal treatment of suppliers; transparent selection process; reduction in (legal) errors; clear audit trial; more efficiency in the tactical procurement process and improved time management of tendering procedures. Some UN organizations such as UNDP-IAPSO and UNHCR have used E-tendering in the formulation of long-term agreements for vehicles, tents, motorcycles and pharmaceuticals through an in-house developed tendering portal.

(c) E-auctioning
E-auctioning supports the contract stage. It enables the closing of a deal with a supplier if parties agree on price. They operate with an upward or downward price mechanism e.g. e-auctioning with upward price mechanism for the selling organization and e-reverse auctioning with a downward price mechanism for the buying organization. They can be made in accordance with traditional ITB/RFP. They are internet based using open or closed systems.

(d) E-ordering and web-based ERP
E-ordering and web-based ERP is the process of creating and approving procurement requisitions, placing purchase orders, as well as receiving goods and services ordered, by using software systems based on the Internet.
(e) **E-informing**

E-informing is not directly associated with a stage in the procurement process; it is the process of gathering and distributing procurement information both from and to internal and external parties using Internet technology.

(f) **e governance**

“E-Government” refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.

Traditionally, the interaction between a citizen or business and a government agency took place in a government office. With emerging information and communication technologies it is possible to locate service centers closer to the clients. Such centers may consist of an unattended kiosk in the government agency, a service kiosk located close to the client, or the use of a personal computer in the home or office.

Just like e-commerce, which allows businesses to transact with each other more efficiently (B2B) and brings customers closer to businesses (B2C), e-government aims to make the interaction between government and citizens (G2C), government and business enterprises (G2B), and inter-agency relationships (G2G) more friendly, convenient, transparent, and inexpensive.

**Additional notes**

**e-business;**

Ebusiness (e-business) or electronic business refers to commercial activities performed over computers and related technologies mainly through networks such as intranets, extranets, and the Internet to streamline, improve, and extend business operations. Ebusiness and ecommerce are often viewed to be one and the same, however this is incorrect. Ecommerce is simply a part ebusiness, more specifically, the trading aspect of ebusiness.

E-business and Intranets:

An intranet is network of computers that belong to an organization. Companies use intranets to efficiently share information such as work-related documents and to facilitate collaborative efforts amongst its employees. It’s a private network, thus only authorized users have access.
Ebusiness and Extranets:

An extranet is essentially an intranet except it allows authorized people outside the company access to certain areas of the system. Extranets streamline business processes with suppliers, vendors, and business partners.

Ebusiness and the Internet:

The Internet is the global network of interconnected computer networks. From work-at-home moms to mom-and-pop shops to big corporations, the Internet provides new business opportunities to those who embrace it. The Internet is here to stay; if you want a piece of the pie, then it is imperative that you approach it just like a brick-and-mortar business and have a solid strategy. Otherwise, join those that have gone before you in the black hole of cyberspace.

It's the small fish in the pond that are especially happy thanks to the vast amount of affordable e-commerce software and ecommerce hosting solutions readily available to help them reach far beyond their local market.