



INFORMATION TECHNOLOGY AND BUSINESS

CHAPTER OUTLINE

Upon completion of this chapter, students should be able to:

- Business in the Information Age
- Roll of Information Technology in Business
- Organization structure and IT support
- Business Information Systems
- IT for business
- IT for individuals;
- Computers in past and present



Business in Information Age

The current age referred as Information age, Digital age or New Media age has paved the way for great revolution in various spheres of business and industry. We cannot imagine our life without information technology and computers.

Information technology is defined as capabilities offered to organizations by computers, software applications, and telecommunications to deliver data, information, and knowledge to individuals and processes. This is the era of Information Technology. Everyone is dependent on information technology. It is used everywhere- business, industry, home, education, entertainment and science.

Before understanding relation of information technology with business, we should understand that it is made of two words Information and Technology. Information is all about communicating and receiving of knowledge and data. Technology means the body of knowledge that is used to develop tools and machines for solving various organizational problems. Information systems are established tools which are expert in finding the position of the business and alert the companies of eventual crisis possibilities in the future. Information technology includes usage of computers, networks, mobile and wireless devices, satellite telecommunications, robotics, electronic mail, and automated office equipment.

Characteristics of Information

- **Accuracy:** This means information is free from errors and mistakes. It also means the information is from bias. Incorrect information can lead to wrong decisions.
- **Timeliness:** It means the information should reach the receiver within a defined time. The information should be latest. There should not be any delays.
- **Relevance:** This means particular information may be useful for one person while it may not be useful to another person. Information should be useful enough so that managers can draw decisions out of it.
- **Complete Information:** Complete Information should be complete to be used for making right decisions. In organizations, information systems are employed which enable transforming data into information to generate knowledge which helps in decision making.

Importance of Information Technology

Information technology has tremendously paved the way of business organizations towards innovation and growth. Over the past years, there have been improvements in productivity and efficiency with the adoption of information-based systems. In the following sections, we will understand how information technology is important and its application in various functions of business.

- **Office Automation:** This involves using computer and communication technology for managing organizational information. It includes usage of computers, telephones, email and machines. Nowadays Office automation Speed Communication Better organized data Business Analysis Productivity Unit 8 – Information Technology and Business
- **Communication:** Information technology has made it easier for the organizations to communicate with the customers, suppliers and employees.
- **Business Analysis:** Business Analysis is aimed at providing solutions to various complex business problems.
- **Information Technology in different areas of business:** Information technology has got role to play in almost functional areas of the business. It can be said that it has to play an imperative part now. Let us understand in detail how business enterprises use IT in different functions of business
- **Finance & Accounting:** Information technology is used in finance and accounting functions of the firms. All the financial information pertaining to daily entries of sales, purchases, salary disbursements, etc. are easily handled in various financial software's. For example, firms are primarily dependent on Tally for journal entries as well as preparation of financial statements. Business enterprises also use software packages for various processes like payroll, billing, budgeting, etc.
- **Human Resource Management:** The firms can easily rely on IT tools as far as the function of Human resource management (HRM) is concerned. Beginning from the functions of recruitment to employee exit, information technology is a great help to companies. Owing to availability of easy communication on internet, HR managers can get the resumes of perspective employees on their E-mails. Besides this, they can take aptitude tests and interviews of the candidates online. Other areas whereby IT can be utilized for daily attendance, maintaining information of employees, compensation management, performance appraisal, etc. This saves on unnecessary human effort as well as costs on paper work. Firms also make use of HRM software's for these discussed activities.
- **Marketing:** Marketing function in current scenario has evolved a lot recently. This is to be attributed to the information technology and development of communication facilities. Marketing department is the face of the company. It deals with creating, communicating and delivering value to the customers. IT has provided wings to marketing. The companies can reach to its customers through using tools like digital marketing and Customer relationship management (CRM). Digital marketing is promotion of products and services using digital channels to reach consumers.

Information System

There are a number of systems in place to facilitate our national security, the power grid, and other important aspects of our daily lives. A variety of systems are also found in all organizations, including systems to facilitate accounting activities, such as issuing bills and processing payrolls; systems to provide information to help managers make decisions; systems to enable the sale and delivery of products; and systems to enable workers to exchange information and collaborate on projects.

A system is a collection of elements and procedures that interact to accomplish a goal. For example, a transit system is a collection of elements and procedures (people, buses or trains, fares, and schedules, for instance) designed to get people from one place to another.

An information system (IS) is a collection of elements (people, hardware, software, and data) and procedures that interact to generate information needed by the users in an organization. Information systems manage and process data from the time it is generated (such as data resulting from orders, documents, and other business transactions) through its conversion into information. Typically, information systems are computerized, although they don't have to be. The information that information systems provide is used to support a wide variety of activities, from day-to-day transactions to long-term strategic planning.

Components of an IS

A computerized IS consists of six interacting components. Regardless of type and where and by whom they are used within an organization, the components of an IS must be carefully managed to provide maximum benefit to an organization.

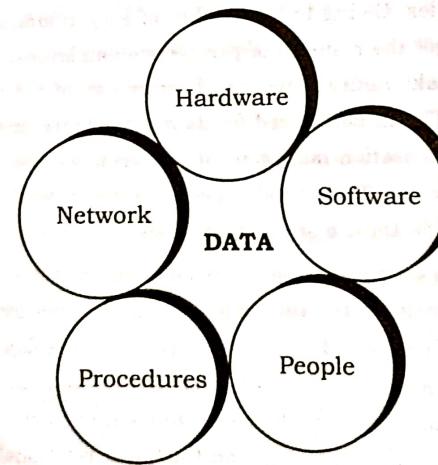


Figure: Component of IS

1. **Hardware:** Any physical device used in a computerized IS. Examples include central processing unit (CPU), sound card, video card, network card, hard drive, display, keyboard, motherboard, processor, power supply, modem, mouse, and printer.

2. **Software:** A set of machine-readable instructions (code) that makes up a computer application that directs a computer's processor to perform specific operations. Computer software is nontangible, contrasted with system hardware, which is the physical component of an IS. Examples include Internet browser, operating system (OS), Microsoft Office, Skype, and so on.
3. **People:** Any person involved in using an IS. Examples include programmers, operators help desk, and end-users.
4. **Procedures:** Documentation containing directions on how to use the other components of an IS. Examples include operational manual and user manual.
5. **Network:** A combination of lines, wires, and physical devices connected to each other to create a telecommunications network. In computer networks, networked computing devices exchange data with each other using a data link. The connections between nodes are established using either cable media or wireless media. Networks can be internal or external. If they are available only internally within an organization, they are called "intranets." If they are available externally, they are called "internets." The best-known example of a computer network is the World Wide Web.
6. **Data:** Raw or unorganized facts and figures (such as invoices, orders, payments, customer details, product numbers, product prices) that describe conditions, ideas, or objects.

Users of Information Systems

Some information systems are very specialized and are used by just one individual or department in an organization; others are more general purpose and may be used by nearly all employees. Systems that are used by an entire enterprise are referred to as enterprise systems.

- **Executive managers:** include the highest management positions in an organization, such as the president and chief executive officer (CEO); they use information systems to make relatively unstructured, long-term strategic decisions.
- **Middle managers:** include managers who fall between executive managers and operational managers; they use information systems to make moderately structured, tactical decisions.
- **Operational managers:** include supervisors, office managers, foremen, and other managers who supervise nonmanagement workers; they use information systems to make highly structured, operational decisions geared toward meeting short-term objectives.
- **Non-management workers:** include office workers, accountants, engineers, and other workers; they use information systems to make the on-the-job decisions necessary to perform their jobs.
- **External users:** include individuals outside an organization, such as customers, suppliers, and other types of strategic partners; they use the organization's information systems to obtain the information needed in the context of their relationship with that organization.

THE ROLE OF INFORMATION SYSTEMS IN BUSINESS TODAY

As managers, most of you will work for firms that are intensively using information systems and making large investments in information technology. You will certainly want to know how to invest this money wisely. If you make wise choices, your firm can outperform competitors. If you make poor choices, you will be wasting valuable capital.

In contemporary systems, there is a growing interdependence between a firm's information systems and its business capabilities. Changes in strategy, rules, and business processes increasingly require changes in hardware, software, databases, and telecommunications. Often what the organization would like to do depends on what its systems will permit it to do.

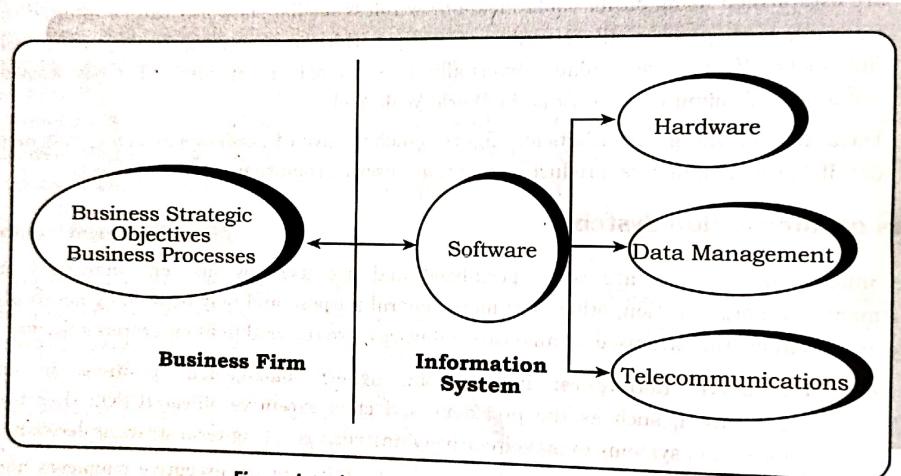


Figure: Interdependence between IS and business

The role of IT in Business can be summarized as:

Business firms invest heavily in information systems to achieve six strategic business objectives: operational excellence; new products, services, and business models; customer and supplier intimacy; improved decision making; competitive advantage; and survival.

Operational Excellence

Businesses continuously seek to improve the efficiency of their operations in order to achieve higher profitability. Information systems and technologies are some of the most important tools available to managers for achieving higher levels of efficiency and productivity in business operations, especially when coupled with changes in business practices and management behavior.

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New Products, Services, and Business Models

Information systems and technologies are a major enabling tool for firms to create new products and services, as well as entirely new business models. A business model describes how a company produces, delivers, and sells a product or service to create wealth.

Customer and supplier intimacy

When a business really knows its customers, and serves them well, the customers generally respond by returning and purchasing more. This raises revenues and profits. Likewise with suppliers: the more a business engages its suppliers, the better the suppliers can provide vital inputs. This lowers costs.

Improved decision making

Without accurate and timely information, business managers must make decisions based on forecasts, best guesses, and luck, a process that results in over and under-production of goods, raising costs, and the loss of customers. Information systems and technologies have made it possible for managers to use real-time data from the marketplace when making decisions.

Competitive advantage

When firms achieve one or more of these business objectives—operational excellence; new products, services, and business models; customer/supplier intimacy; and improved decision making—chances are they have already achieved a competitive advantage. Doing things better than your competitors, charging less for superior products, and responding to customers and suppliers in real time all add up to higher sales and higher profits that your competitors cannot match.

Survival

Business firms also invest in information systems and technologies because they are necessities of doing business. Sometimes these “necessities” are driven by industry-level changes

Organization Structure And IT Support

Organizational structure is a conceptual blueprint that defines the structure and operations of an enterprise (a business, organization, government agency, or other entity). The goal of organizational structure is to provide a detailed picture of an organization, its functions, and its systems, and the relationships among these items—it is essentially a map of an organization's business functions and systems. With the complexity of today's systems, organizational architecture allows managers to better organize and maximize the use of information technology (IT) resources, as well as make informed decisions with fewer mistakes. Experts agree that developing an organizational structure is not easy and requires a great deal of time and effort. The first step is usually to examine the existing systems and functions to identify gaps, overlaps, and other possible issues with the existing setup.

Organizations have a structure that is composed of different levels and specialties. Their structures reveal a clear-cut division of labor. Authority and responsibility in a business firm are organized as a hierarchy, or a pyramid structure. The upper levels of the hierarchy consist of managerial, professional, and technical employees, whereas the lower levels consist of operational personnel.

Senior management makes long-range strategic decisions about products and services as well as ensures financial performance of the firm. Middle management carries out the programs and plans of senior management, and operational management is responsible for monitoring the daily activities of the business. Knowledge workers, such as engineers, scientists, or architects,

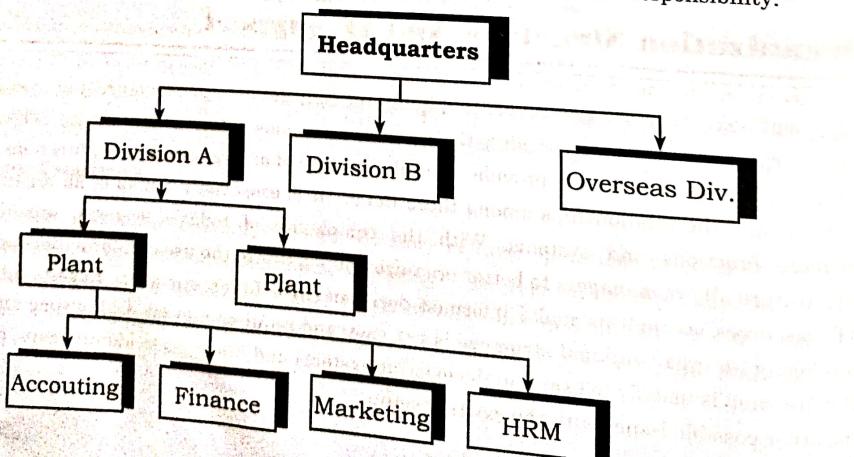
An organization coordinates work through its hierarchy and through its business processes. Most organizations' business processes include formal rules that have been developed over a long time for accomplishing tasks. These rules guide employees in a variety of procedures, from writing an invoice to responding to customer complaints.

Size and number of locations are the major factors that determine the organization's structure. Organizational structure is comprised of functions, relationships, responsibilities, authorities, and communications of individuals within each department. Broadly we can describe organizational structures into following two types:

- **Hierarchical organizational**
 - **Matrix management**
- Hierarchical organizational**

A hierarchical organization is an organization structured in a way such that every entity in the organization, except one, is subordinate to a single entity. Among large organizations; most corporations, governments, are hierarchical organizations.

The main disadvantages of hierarchical structure are inflexibility and non-responsibility.



Matrix Management

It is a type of management used by some organizations to promote the team work on a functional basis rather than departments. People with similar skills are pooled for work assignments. This structure is effective on the firm that develops many new products.

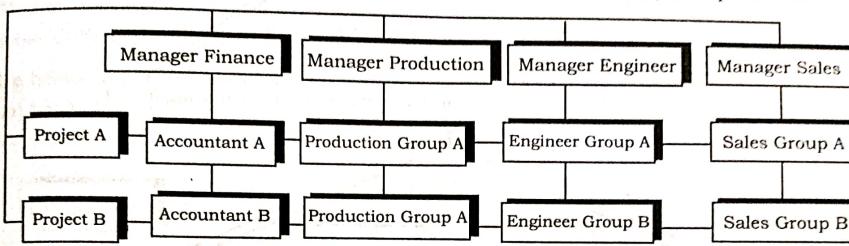


Figure: Matrix Management

IT Flattens Organizations

Large, bureaucratic organizations, which primarily developed before the computer age, are often inefficient, slow to change, and less competitive than newly created organizations. Some of these large organizations have downsized, reducing the number of employees and the number of levels in their organizational hierarchies. Behavioral researchers have theorized that information technology facilitates flattening of hierarchies by broadening the distribution of information to empower lower-level employees and increase management efficiency. IT pushes decision-making rights lower in the organization because lower-level employees receive the information they need to make decisions without supervision. Because managers now receive so much more accurate information on time, they become much faster at making decisions, so fewer managers are required. Management costs decline as a percentage of revenues, and the hierarchy becomes much more efficient.

These changes mean that the management span of control has also been broadened, enabling high-level managers to manage and control more workers spread over greater distances. Many companies have eliminated thousands of middle managers as a result of these changes.

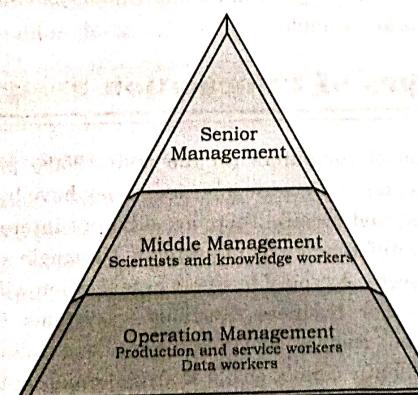


Figure: Levels in Business Firm

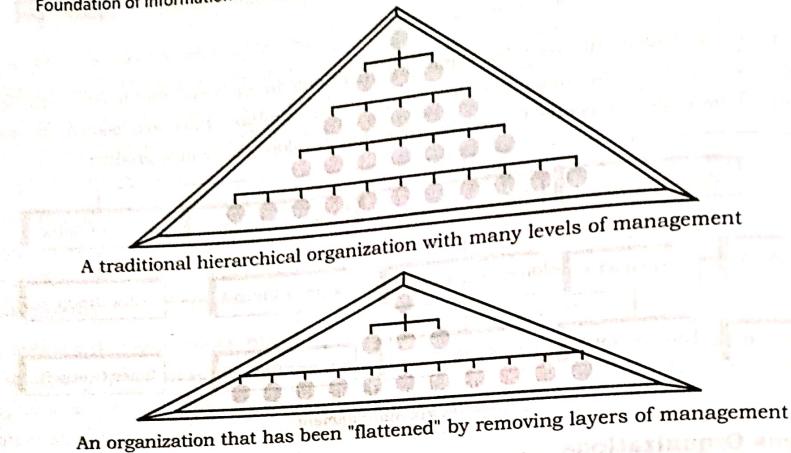


Figure: Flattening Organization

Information systems can reduce the number of levels in an organization by providing managers with information to supervise larger numbers of workers and by giving lower-level employees more decision-making authority

Postindustrial Organizations

In postindustrial societies, authority increasingly relies on knowledge and competence, and not merely on formal positions. Hence, the shape of organizations flattens because professional workers tend to be self-managing, and decision making should become more decentralized as knowledge and information become more widespread throughout the firm (Drucker, 1988). Information technology may encourage task force-networked organizations in which groups of professionals come together—face to face or electronically—for short periods of time to accomplish a specific task (e.g., designing a new automobile); once the task is accomplished, the individuals join other task forces. The global consulting service Accenture is an example.

Evolution and Types of Information System

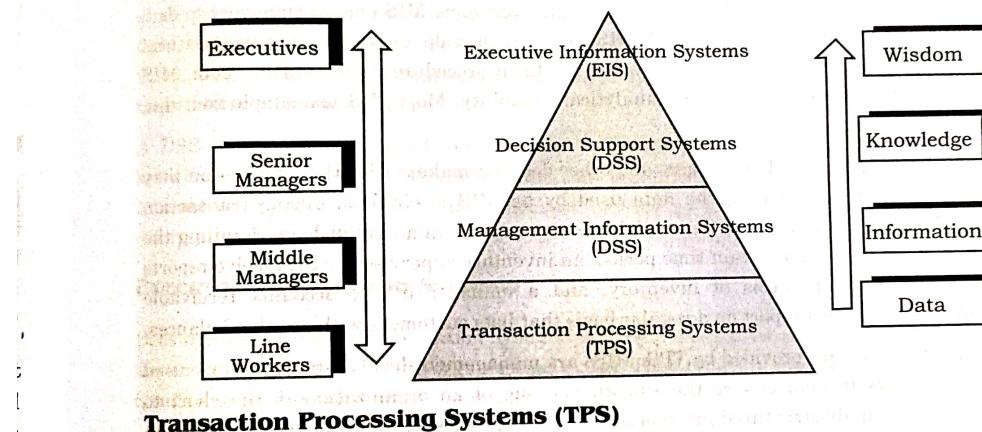
The first business application of computers (in the mid- 1950s) performed repetitive, high-volume, transaction-computing tasks. Because a business may have hundreds or even thousands of different business processes, and because there are different interests, specialties, and levels in an organization, there are different kinds of systems. No single system can provide all the information an organization needs. A typical business organization will have systems supporting processes for each of the major business functions – systems for sales and marketing, manufacturing and production, finance and accounting, and human resources. Functional systems that operate independently cannot easily share information to support cross-functional business processes. Independent functional systems are being replaced with large-scale cross

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functional systems that integrate the activities of related business processes and organizational units. A typical business firm will also have different systems supporting decision making needs of each of the main management groups. Operational management, middle management, and senior management each use a specific type of system to support decision making. Organization have executive support systems (ESS) at the strategic level, management information systems (MIS) and decision support systems (DSS) at the middle level, and transaction processing systems (TPS) at the operational level.

Figure below illustrates the classification of the different types of ISs used in organizations, the typical level of workers who use them and the types of input/output (I/O) produced by each of the ISs



Transaction Processing Systems (TPS)

Transaction processing systems (TPS) are the computerized system that performs and records the daily routine transactions necessary to conduct business, such as, sales order entry, hotel reservation systems, payroll, employee record keeping, and shipping. These systems serve the operational level of the organization. Transaction processing systems are central to a business. TPS failure for a few hours can cause a firm's demise and perhaps other firms linked to it. Managers need TPS to monitor the status of internal operations and the firm's relations with external environment. TPS are also major producers of information for the other types of systems. Organizational data are processed by a TPS, for example, sales orders, reservations, stock control, and payments by payroll, accounting, financial, marketing, purchasing, inventory control, and other functional departments.

TPSs are essential systems. Transactions that are not captured can result in lost sales, dissatisfied customers, unrecorded payments, and many other types of data errors with financial impacts. Data captured by a TPS are processed and stored in a database; they then become available for use by other systems. Processing of transactions is done in one of two modes:

1. **Batch processing:** A TPS in batch processing mode collects all transaction for a day, shift, or other time period, and then processes the data and updates the data stores. Payroll processing done weekly or bi-weekly is an example of batch mode.

2. **Online transaction processing (OLTP):** It is also called real-time processing. The TPS processes each transaction as it occurs, which is what is meant by the term real-time processing. In order for OLTP to occur, the input device or website must be directly linked via a network to the TPS. Airlines need to process flight reservations in real time to verify that seats are available.

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Decision Support Systems (DSS)

A decision support system (DSS) is an information system that is also used to help make decisions. Unlike the more structured transaction processing and management information systems, however, decision support systems are typically interactive and provide information on demand whenever a decision needs to be made.

Decision support systems (DSS) support non-routine decision making for middle management; They focus on problems that are unique and rapidly changing, for which the procedure for arriving at a solution may not be fully predefined in advance. These systems use internal information from TPS and MIS, and often information from external sources, such as current stock prices or product prices of competitors. These systems use a variety of models to analyze data, or they condense large amounts of data into a form in which decision makers can analyze them. DSS are also called ***business intelligence systems*** because they focus on helping users make better business decisions.

A DSS is a knowledge-based system used by senior managers to facilitate the creation of knowledge and allow its integration into the organization. More specifically, a DSS is an interactive application that supports decision-making by manipulating and building upon the information from an MIS and/or a TPS to generate insights and new information.

Executive Information Systems

EISs are strategic-level information systems that help executives and senior managers analyze the environment in which the organization exists. They typically are used to identify long-term trends and to plan appropriate courses of action.

Executive support systems (ESS) help senior managers addressing strategic issues and long-term trends, both in the firm and in external environment. These systems are designed to address non-routine decisions requiring judgment, evaluation, and insight because there is no agreed-on procedure for arriving at a solution. ESS presents graphs and data from many sources through an interface that is easy for senior managers to use. Often the information is delivered to senior executives through a **portal**, which uses a Web interface to present integrated personalized business content. These systems incorporate data about external events such as new tax laws or competitors, but they also draw summarized information from internal MIS and DSS.

IT for Individuals

Information technology has changed our lives drastically. You are only a single click away from everything. The list of the benefits of information technology in our lives are explained below:

- With the advancement in IT, one can access the system of the company from any place. It is not necessary for the authority to be in the office only. They can submit their work from home as well. Easy access to the system has surely increased one's productivity without any physical presence of the person in the office.

- There is a huge demand for IT professionals in various fields. The demand opens an immense opportunity for IT professionals to explore the field and show their talent. The IT field offers people to work for computer programming, system analysis, testing, software and hardware development, web application design etc.
- With the advancement of information technology, the education field has transformed its outlook and has adopted a modern way of teaching and learning. Teaching on the blackboard is now an old thing. Teachers and institutions are using modern gadgets to teach their students. A computer with an internet connection helps students to learn new things and understand the topics easily and deeply.
- Information technology helps patients as well. They can now connect with physicians and take advice online. Also, there are many virtual healthcare applications available to provide guidance. Electronic health records and tele-medicines are delivering efficient and quality health to patients.
- In the technology world, with information technology, the drawback of time and distance in business activities has been removed. Now, buying and selling are too easy. Customers can buy online from their locals and international vendors as well.
- With wireless communication mediums, news broadcasts have become so easier. Only a few seconds are needed to know the news from any corner of the world.
- Use of the internet on mobile phones, tablets, laptops, iPods, and other gadgets has been offering us unlimited access to entertainment mediums. People can watch movies or new songs on OTT platforms.
- With the Information technology, communication between people has become cheaper, easier and faster than ever before. Texting, video calling, sending e-mails are so easy nowadays. There are so many apps available online to provide these services.
- With the Information technology, we have seen and understood the meaning of globalization. Today, the world is on one platform and there are no physical barriers between nations. People are now 'global' citizens.

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IT For Business

Information technology (IT) is the lifeblood of most businesses. It is used to fulfill administrative and production requirements, and it crosses all industries. Generally, the larger the enterprise, the greater the need for a sophisticated and professionally managed information technology infrastructure.

Computers are at the core of IT, but to say information technology is just computers is to ignore the complexity and diversity of the technologies businesses need to stay afloat in the 21st century. A more complete definition of IT is this: all of an organization's hardware and software for storing, retrieving, transmitting, and managing electronic information. Information in this context is in its broadest sense and includes images and digitized sound and video. Among the tools companies use to manage their information are:

- personal computers, terminals, and workstations
- network servers (including Internet) and other networking hardware
- mainframes

- scanners, printers, and other peripherals
- all forms of software, including proprietary systems and site licenses for off-the-shelf packages.

These technologies serve many purposes in a business. Some are purely logistical or convenient and thereby save time and resources. Others are essential to the company's output or its competitive advantage. Examples of IT's benefits to different areas of an enterprise include:

- timely and efficient delivery of products and services
- higher sales through better understanding of customer behaviors
- cost savings from fewer staff hours and reduced human or machine error
- better resource planning through detailed, accurate, and timely financial information.

Medium to large corporations oversee their often substantial investments in these technologies through a specialized department that may be known simply as IT, or as information systems (IS) or management information systems (MIS). This area may be under the direction of a chief information officer (CIO), but many IT departments report ultimately to the company's chief financial officer (CFO).

Acquisitions and Upgrades

Most large organizations must purchase and install new hardware and software on a regular basis. In order to do so effectively, IT managers must be familiar simultaneously with business needs and available technologies. Some purchases may be very routine; the corporation may only need additional units of existing devices it has already implemented, or, as is the case with software upgrades, there may only be one logical course of action. However, many IT-acquisition decisions demand strategic vision for the organization. IT decision-makers must be able to match present and future needs with technological solutions, often in the face of rapidly changing technologies and severe financial repercussions from choosing the wrong technology.

The acquisition process can be especially troublesome when custom software is being implemented. These projects are notorious for exceeding cost estimates and taking longer than planned. Moreover, custom software clients must be wary, after added time and expense, of whether the new system will serve all of the needs it was intended to satisfy—and without losing the essential strengths and capabilities of the system it is replacing.

Service and Maintenance

Another requisite to owning information technology is ensuring that it is compatible with other technologies already in place and that it functions properly. Compatibility issues extend from making software applications work together on a single computer to allowing substantially different computer systems to share information. A mix of new and old technology can present special challenges. Over time, most computer equipment requires some form of servicing, usually due to component failures, user mistakes, or obsolescence. This aspect of IT isn't trivial: performing routine service and maintenance in a large IT environment may require a substantial investment in technical staff hours (or outside services) and replacement equipment.

Computers in Past and Present

The beginnings of the computer started off in a rather unique way. It was first used to produce intricate designs with silk, a task far to long a tedious for a human to do constantly. It's really unbelievable how the computers changed from that to what they are now. Today, computers are completely astounding. The possibilities are endless.

Who knows where they will take us in the years ahead. The computer is the most influential piece of equipment that has ever been invented. The beginnings of the computer are actually kind of strange. It started in the 1800's when a man named Charles Babbage wanted to make a calculating machine. He created a machine that would calculate logarithms on a system of constant difference and record the results on a metal plate. The machine was aptly named the Difference Engine. Within ten years, the Analytical Engine was produced. This machine could perform several tasks.

These tasks would be giving to the machine and could figure out values of almost any algebraic equation. Soon, a silk weaver wanted to make very intricate designs. The designs were stored on punch-cards which could be fed into the loom in order to produce the designs requested. This is an odd beginning for the most powerful invention in the world. In the 1930's, a man named Konrad Zuse started to make his own type of computer. Out of his works, he made several good advances in the world of computing. First, he developed the binary coding system.

This was a base two system which allowed computers to read information with either a 1 or a 0. This is the same as an on or off. The on or off functions could be created through switches. These switches were utilized with vacuum tubes. The functions could then be relayed as fast as electrons jumping between plates. This was all during the time of the Second World War and further advancements were made in the area of cryptology. Computer advancements were needed in order for the Allied Coding Center in London to decode encrypted Nazi messages. Speed was of the essence, so scientists developed the first fully valve driven computer.

Before this, computers only had a number of valves, none were fully driven by them because of the complexity and difficulty of producing it. Despite the odds, several Cambridge professors accomplished the mammoth task. Once it was built, the computer could decode the encrypted messages in enough time to be of use, and was an important factor in the end of World War II. The war also provided advancements in the United States as well. The trajectory of artillery shells was a complex process that took a lot of time to compute on the field. A new, more powerful computer was in dire need.

Working with the Moore School of Electrical Engineering, the Ballistics Research Laboratory created the Electronic Numerical Integrator and Computer. The ENIAC could compute things a thousand times faster than any machine built before it. Even though it was not completed until 1946 and was not any help during the war, it provided another launching pad for scientists and inventors of the near future. The only problem with the ENIAC was that it was a long a tedious process to program it. What was needed was a computation device that could store simple programs into its memory for call later.

The Electronic Discrete Variable Computer was the next in line. A young man named John von Neumann had the original plan for memory. His only problem was where and how could the

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instructions be stored for later use. Several ideas were pursued, but the one found most effective at the time was magnetic tape. Sets of instructions could be stored on the tapes and could be used to input the information instead of hand feeding the machine every time. If you have ever heard of a tape backup for a computer, this is exactly what this is.

All the information on your computer can be stored on the magnetic tape and could be recovered if your system ever crashed. It's strange that a method developed so long ago is still in use today, even though the computer today can do a lot more than simply compute. The computer works in a relatively simple way. It consists of five parts; input, output, memory, CPU, and arithmetic logic unit. Input is the device used by the operator of the computer to make it do what is requested. The output displays the results of the tasks created from the input.

The data goes from the input to the memory then to the arithmetic logic unit for processing then to the output. The data can then be stored in memory if the user desires. Before the advent of the monitor, the user would have to hand feed cards into the input and wouldn't see the results until it was displayed by the printer. Now that we have monitors, we can view the instant results of the tasks. The main component that allows the computer to do what is desired is the transistor. The transistor can either amplify or block electrical currents to produce either a 1 or a 0.

Previously done by valves and vacuum tubes, the transistor allows for much faster processing of information. The microprocessor consists of a layered microchip which is on a base of silicone. It is a computer in itself and is the most integral part of the CPU in modern computers. It is a single chip which allows all that happens on a computer. Integrated circuits, a microchip which is layered with its own circuitry, also provide a much more manageable memory source. The only reason magnetic tape backups are used today is because of the space which is needed in order to backup an entire computer.

Memory for today's computers consist of RAM or ROM. ROM is unchangeable and stores the computer's most vital components, its operating instructions. Without this, the computer would be completely inoperable. Programs today use the instructions in the ROM to complete the tasks the program is attempting. This is why you cannot use IBM programs on a Macintosh, the ROM and operating systems are different, therefore the programming calls are different. Some powerful computers today can complete both sets of tasks because they have both sets of instructions in the stored in the ROM.

The reason ROM is unchangeable is because of people who don't know what they are doing could mess things up on their computer forever. RAM is the temporary memory that is in a computer. This is the memory that is used by programs to complete their tasks. RAM is only temporary because it requires a constant electrical charge. Once the computer is shut off, the RAM loses everything that was in it. That is why you lose work that you have done if the power goes off and you didn't save it first. If something needs to be saved, it is either saved to the hard disk within the computer or a floppy disk.

With today's networking capabilities, things can be saved on completely separate machines called servers. Though the process of saving is the same, a server can be located five feet away or on the opposite side of the world. With today's technology, anything is possible with the use of a computer. You could visit a website and find that special someone, or create a virus that could crash thousands of machines at a single moment in time. If you have the money, the possibilities are endless. In today's day and age, information is sacred. One of the biggest problems found with information is what is free and what isn't.