Introduction to Information Technology (IT)

The terms "information technology" and "IT" are widely used in business and the field of computing. People use the terms generically when referring to various kinds of computer-related work, which sometimes confuses their meaning.

What Is Information Technology (Today)?

A 1958 article in Harvard Business Review referred to information technology:-

Over the last decade a new technology has begun to take hold in American business, one so new that its significance is still difficult to evaluate. While many aspects of this technology are uncertain, it seems clear that it will move into the managerial scene rapidly, with definite and far-reaching impact on managerial organization. In this article we would like to speculate about these effects, especially as they apply to medium-size and large business firms of the future.

The new technology does not yet have a single established name. We shall call it information technology. It is composed of several related parts. One includes techniques for processing large amounts of information rapidly, and it is epitomized by the high-speed computer. A second part centers around the application of statistical and mathematical methods to decision-making problems; it is represented by techniques like mathematical programing, and by methodologies like operations research. A third part is in the offing, though its applications have not yet emerged very clearly; it consists of the simulation of higher-order thinking through computer programs.

Information technology is likely to have its greatest impact on middle and top management. In many instances it will lead to opposite conclusions from those dictated by the currently popular philosophy of "participative" management. Broadly, our prognostications are along the following lines:

1. Information technology should move the boundary between planning and performance upward. Just as planning was taken from the hourly worker and given to the industrial engineer, we now expect it to be taken from a number of middle managers and given to as yet largely nonexistent specialists: "operations researchers," perhaps, or "organizational analysts." Jobs at today's middle-management level will become highly structured. Much more of the work will be programed, i.e., covered by sets of operating rules governing the day-to-day decisions that are made.

2. Correlatively, we predict that large industrial organizations will recentralize, that top managers will take on an even larger proportion of the innovating, planning, and other "creative" functions than they have now.

3. A radical reorganization of middle-management levels should occur, with certain classes of middle-management jobs moving downward in status and compensation (because they will require less autonomy and skill), while other classes move upward into the top-management group.

4. We suggest, too, that the line separating the top from the middle of the organization will be drawn more clearly and impenetrably than ever, much like the line drawn in the last few decades between hourly workers and first-line supervisors.

The New Technology

Information technology has diverse roots—with contributions from such disparate groups as sociologists and electrical engineers. Working independently, people from many disciplines have been worrying about problems that have turned out to be closely related and cross-fertilizing. Cases in point are the engineers' development of servomechanisms and the related developments of general cybernetics and information theory. These ideas from the "hard" sciences all had a direct bearing on problems of processing information—in particular, the development of techniques for conceptualizing and measuring information.

As consisting of three basic parts: computational data processing, decision support, and business software. This time period marked the beginning of IT as an officially defined area of business; in fact, this article probably coined the term.

Over the ensuring decades, many corporations created so-called "IT departments" to manage the computer technologies related to their business. Whatever these departments worked on became the *de facto* definition of Information Technology, one that has evolved over time. Today, IT departments have responsibility in areas like

- computer tech support
- business computer network and database administration
- business software deployment
- information security

Especially during the dot-com boom of the 1990s, Information Technology also became associated with aspects of computing beyond those owned by IT departments. This broader definition of IT includes areas like:

- software development
- computer systems architecture
- project management

Information Technology Jobs and Careers

Job posting sites commonly use IT as a category in their databases. The category includes a wide range of jobs across architecture, engineering and administration functions. People with jobs in these areas typically have college degrees in computer science and/or information systems. They may also possess related industry certifications.

A career in Information Technology can involve working in or leading IT departments, product development teams, or research groups.

Issues and Challenges in Information Technology

1. As computing systems and capabilities continue expanding worldwide, *data overload* has become an increasingly critical issue for many IT professionals. Efficiently processing huge

amounts of data to produce useful business intelligence requires large amounts of processing power, sophisticated software, and human analytical skills.

2. *Teamwork and communication* skills have also become essential in most businesses, to manage the complexity of IT systems. Many IT professionals are responsible for providing service to business users who are not trained in computer networking and other information technologies, but who are instead interested in simply using the technology to get their work done efficiently.

3. *System and network security* issues are a primary concern for many business executives, as any security breach can potentially damage a company's reputation and cost large sums of money.

Computer Networking and Information Technology

Because networks play a central role in the operation of many companies, business computer networking topics tend to be closely associated with Information Technology. Networking trends that play a key role in IT include:

- *Network capacity and performance*: The popularity of online video has greatly increased the demand for network bandwidth both on the Internet and on IT networks. New types of software applications that support richer graphics and deeper interaction with computers also tend to generate larger amounts of data and hence network traffic. Information technology teams must plan appropriately not just for their company's current needs but also this future growth.
- *Mobile and wireless usages*: IT network administrators must now support a wide array of smartphones and tablets in addition to traditional PCs and workstations. IT environments tend to require high-performance wireless hotspots with roaming capability. In larger office buildings, deployments are carefully planned and tested to eliminate dead spots and signal interference.
- *Cloud services*: Whereas IT shops in the past maintained their own server farms storing email and business databases, some have begun migrating to cloud computing environments, where third-party hosting providers maintain the data. This change in computing model dramatically changes the patterns of traffic on a company network but also requires significant effort in training employees on this new breed of applications.

Network Bandwidth:-

in computer networking refers to the data rate supported by a network connection or interface. One most commonly expresses bandwidth in terms of bits per second (bps). The term comes from the field of electrical engineering, where bandwidth represents the total distance or range between the highest and lowest signals on the communication channel (band).

Bandwidth represents the capacity of the connection. The greater the capacity, the more likely that greater performance will follow, though overall performance also depends on other factors, such as latency.

[Wireless Hotspots:-](#)

A **hotspot** is any location where Wi-Fi network access (usually Internet access) is made publicly available. You can often find hotspots in airports, hotels, coffee shops, and other places where business people tend to congregate. Hotspots are considered a valuable productivity tool for business travelers and other frequent users of network services.

Technically speaking, hotspots consist of one or several wireless access points installed inside buildngs and/or adjoining outdoor areas. These APs are typically networked to printers and/or a shared high-speed Internet connection. Some hotspots require special application software be installed on the Wi-Fi client, primarily for billing and security purposes, but others require no configuration other than knowledge of the network name (SSID).

Wireless service providers like **T-Mobile** generally own and maintain hotspots. Hobbyists sometimes setup hotspots as well, often for non-profit purposes. The majority of hotspots require payment of hourly, daily, monthly, or other subscription fees.

Hotspot providers strive to make connecting Wi-Fi clients as simple and secure as possible. However, being public, hotspots generally provide less secure Internet connections than do other wireless business networks.

[Cloud Computing:-](#)

Cloud computing consists of hardware and software resources made available on the Internet as managed third-party services. These services typically provide access to advanced software applications and high-end networks of server computers.

Types of Cloud Computing

Service providers create cloud computing systems to serve common business or research needs. Examples of cloud computing services include:

- *virtual IT* - configure and utilize remote, third-party servers as extensions to a company's local IT network

- *software* - utilize commercial software applications, or develop and remotely host custom built applications

- *network storage* - back up or archive data across the Internet to a provider without needing to know the physical location of storage

Cloud computing systems all generally are designed for *scalability* to support large numbers of customers and surges in demand.