**CHAPTER 1**

**Topics:**

1. **Introduction to information technology**
2. **Business values of IT**
3. **Role of computer in modern business**
4. **Current trends**
5. **Business in Digital Economy**

**Introduction to Information Technology**

Information technology refers to all forms of technology applied to processing, storing, and transmitting information in electronic form. The physical equipment used for this purpose includes computers, communications equipment and networks, fax machines, and even electronic pocket organizers. Information systems execute organized procedures that process and/or communicate information. We define information as a tangible or intangible entity that serves to reduce uncertainty about some state or event.

Data can originate from the internal operations of the firm and from external entities such as suppliers or customers. Data also come from external databases and services; for example, organizations purchase a great deal of marketing and competitive information. Brokerage firms provide a variety of research on different companies to clients.

An information system usually processes these data in some way and presents the results to users. With the easy availability of personal computers, users often process the output of a formal system themselves in an ad hoc manner. Human interpretation of information is extremely important in understanding how an organization reacts to the output of a system. Different results may mean different things to two managers. A marketing manager may use statistical programs and graphs to look for trends or problems with sales. A financial manager may see a problem with cash flow given the same sales data. The recipient of a system's output may be an individual, as in the example of the marketing manager, or it may be a workgroup.

Many systems are used routinely for control purposes in the organization and require limited decision making. The accounts receivable application generally runs with little senior management oversight. It is a highly structured application with rules that can be followed by a clerical staff. A department manager handles exceptions. The output of some systems may be used as a part of a program or strategy. The system itself could be implementing a corporate strategy, such as simplifying the customer order process. A system might help managers make decisions.

Information technology, however, extends far beyond the computational capabilities of computers. Today computers are used extensively for communications as well as for their traditional roles of data storage and computation. Many computers are connected together using various kinds of communications lines to form networks. There are more than 43 million host computers, for example, on the Internet, and over 1 00 million computers around the world access it, an estimated 70 million of which are in the U.S. Through a network, individuals and organizations are linked together, and these linkages are changing the way we think about doing business. Boundaries between firms are breaking down from the electronic communications link provided by networks. Firms are willing to provide direct access to their systems for suppliers and customers. If the first era of computing was concerned with computation, the second era is about communications.

**Business Values of IT**

Gartner puts worldwide IT (information technology) spending at over USD 3700 billion in 2014, signaling a 2.1% growth on the previous year despite corporate budget cuts. Knowing that success rate of IT projects tend to be rather low, this certainly arouse professionals’ curiosity as to whether there is any value creation behind the spending figures.

Information technology (or information system) business value is captured in different studies by various effects on corporate performance, like:

* the ability of IS to create a competitive advantage;
* the productivity of IS at the organizational level;
* added value as the difference between revenues and expenses;
* The economic contribution of IS to management’s profit-maximizing efforts.

TABLE 1.

BASIC CONCEPTS OF IT BUSINESS VALUE RESEARCH

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Concept** |  | **Definition** | |  |
| Information | „as denoting the technologies used for | | | |
| Technology | processing, storing, | |  |  |
| (IT) | and transporting information in digital | | | |
|  | form.” | |  |  |
|  |  | | | |
| Information | „include any combination of information | | | |
| System (IR) | technology and people’s activities using that | | | |
|  | technology | to | support | operations, |
|  | management, and decision-making” | | | |
|  |  |  |  |  |
| IT Business | „the organizational performance impacts of | | | |
| Value | information technology at both the | | | |
|  | intermediate process level and the | | | |
|  | Organization wide level, and comprising both | | | |
|  | efficiency impacts | |  |  |
|  | and competitive impacts” | | | |

**Conceptualizing Information Technology**

Tool View: IT viewed as an engineered tool doing what its designers intended

Proxy View: Conceptualized by its essential characteristics, which are defined by

Individual perception of its usefulness or value

Its investment or capital stock denominated in financial units

Ensemble View: Interaction of people and technology in both the development and use of IT

**Defining IT Business Value**

IT Business Value refers to the organizational performance impacts of IT including

* Productivity enhancement
* Cost reduction
* Competitive advantage
* Inventory reduction and other measures of performance

Formulations of performance

* Efficiency
* Effectiveness

**Role of Computer in Modern Business**

In an age of booming technology, running a business without computers is like trying to breathe without lungs. Like it or not, technology has become an integral part of the way business is done. Even if you perform services or provide products which are not technology related in and of themselves-such as dry cleaning and hairstyling-you may find that without a computer, it's difficult to place orders with suppliers or pass information to your accountant.

## Inventory Management

## Retail and wholesale business have increasingly come to rely on computers' advanced ability to keep track of inventory and assist in ordering more when stocks get low. In fact, one of the central approaches to the success of retail giant WalMart was real time ordering in which WalMart's computer systems place orders for goods as they are needed. This allowed them not to carry too much or too little of any particular item as well as to save on the manpower required to manage much of the supply chain. However, businesses of all sizes use inventory management and point of sales systems to do smaller scale versions of the same thing.

## Presentations And Documents

## While it's still possible to find a typewriter at a garage sale, the days of typed papers and documents are dead and gone. Word processing is a must in today's business environment. Not only are computers the medium for document creation, but the ability to email and share documents electronically has become central to the editing, approval and delivery process. Similarly, presentations and reports are commonly delivered in electronic slide show presentations or via webinars. Creators must use programs, such as PowerPoint, to create them as this is the standard for modern business.

## Electronic Communications

## A business not involved in electronic communications -- particularly email -- closes off one of the largest communication channels today. Customers, clients, vendors and business partners use email to make contact and transact business. Some companies go beyond email and actually encourage the use of in-house instant messaging as a method of communications between employees and departments.

## Internet Access

## Internet access is a business' communications lifeline. Internet-enabled computing allows you to receive orders from customers, place orders with suppliers, research businesses, explore business ideas, communicate with government agencies and even manage your business' banking. In addition, online presence with at least a website is critical to legitimizing a business. Many companies go further and participate in social networking sites for marketing and branding purposes.

## Multi-site Networks

## If your business has more than one site or branch, then multi-site networking provides tremendous benefits for accounting, standardizing and managing your multi-faceted operation. Many companies use point of sale systems to ensure standardized operations within a chain of stores or sites. Companies that sell similar products or services in multiple locations find that computer systems help them keep track of revenues, costs and their supply chain from a central office. This allows a centralized management team to get reports on any or all sites and get a macro-view of the business when needed.

**What Are the Advantages of Computers in Business?**

Computers have tremendously improved the way businesses operate in their respective industries. Technology has advanced so remarkably that those who are not using computers in their business are at a major disadvantage against their competitors. In particular, there are several important advantages that computers can provide to small businesses.

## Organization

Computers allow the application of different types of software that can help businesses keep track of their files, documents, schedules and deadlines. Computers also allow businesses to organize all of their information in a very accessible manner. The ability to store large amounts of data on a computer is convenient and inexpensive, and saves space. A computer's ability to allow a company to organize its files efficiently leads to better time management and productivity.

## Self-Sufficiency

Computers have made staff and companies more self-sufficient by allowing them to do tasks that previously had to be outsourced. For example, a company can now use office software to create their own training material. Desktop publishing software can be used to create marketing materials. Online tax and accounting programs allow companies to prepare their own taxes. This allows the dominant operations of a company to remain in-house and empowers the company to become more independent and less susceptible to errors committed by outside parties.

## Cost-Effective

## Emerging technology makes new tools and services more affordable and allows companies to save on their staff payroll and office equipment. Because computers allow work to be done faster and more efficiently, it is possible for a company to hire fewer staff. In addition, with networked and relatively inexpensive computers, companies can store data more easily, saving on the cost of outside file storage, and can avoid having to purchase as many copiers, fax machines, typewriters, and other such items that were used before computers became popular. Correspondingly, potentially profitable businesses can be started with a smaller overhead cost. Email capabilities decrease postage costs; software applications reduce the need for large accounting departments, while videoconferencing reduces the need for travel. All resources saved will trickle down to the consumers, who are then provided with much more affordable products and service.

## Speed

## Computers help speed up other business operations. The collecting of consumer feedback, ordering of raw materials, and inspection of products is made quicker through the use of computers, allowing companies to operate much faster and to produce better quality results.

## Cheaper Research and Development

## R&amp;D, or research and development, costs will also decrease with the help of computers. Scientific research can now be done using the Internet and computer software applications designed to develop and produce new products and services. For example, instead of a company having to do in-person focus groups on a potential new product or to determine their target market, the company can conduct a widespread online survey for a far lower cost. In addition, new models of a product can be created online using virtual pictures and drawings instead of having to be hand-drawn. These interactive models created using software programs can help bring the product and its features to life for a far lower cost than creating an actual physical model of the given product.

## Sales

## Computers can help generate higher sales and profits for businesses via a company website. Many businesses now operate online and around the clock to allow customers from around the world to shop for their products and services.

**Current Trends**

In the past few years, six major trends have drastically altered the way organizations use technology. These trends make it imperative that a manager become familiar with both the use of technology and how to control it in the organization. These trends, discussed further in later chapters, are as follows:

1. The use of technology to transform the organization. The cumulative effect of what all the technology firms are installing is to transform the organization and allow new types of organizational structures. Sometimes the transformation occurs slowly as one unit in an organization begins to use groupware. In other cases, like Kennametal or Oticon, a Danish firm , the firm is totally different after the application of technology.This ability of information technology to transform organizations is one ofthe most powerful tools available to a manager today.
2. The use of information processing technology as a part of corporate strategy. Firms like Bron Pas sot are implementing information systems that give them an edge on the competition. Firms that prosper in the coming years will be managed by individuals who are able to develop creative, strategic applications of the technology.

3. Technology as a pervasive part of the work environment. From the largest corporations to the smallest business, we find technology is used to reduce labor, improve quality, provide better customer service, or change the way the firm operates. Factories use technology to design parts and control production. The small auto-repair shop uses a packaged personal computer system to prepare work orders and bills for its customers. The body shop uses a computer-controlled machine with lasers to take measurements so it can check the alignment of automobile suspensions, frames, and bodies. In this text we shall see a large number of examples of how technology is applied to change and improve the way we work.

1. The use of technology to support knowledge workers. The personal computer has tremendous appeal. It is easy to use and has a variety of powerful software programs available that can dramatically increase the user's productivity. When connected to a network within the organization and to the Internet, it is a tremendous tool for knowledge workers.
2. The evolution of the computer from a computational device to a medium for communications. Computers first replaced punched card equipment and were used for purely computational tasks. From the large centralized computers, the technology evolved into desktop, personal computers. When users wanted access to information stored in different locations, companies developed networks to link terminals and computers to other computers. These networks have grown and become a medium for internal and external communications with other organizations. For many workers today, the communications aspects of computers are more important than their computational capabilities.

6. The growth of the Internet and World Wide Web. The Internet offers a tremendousamount of information on-line, information that you can search fromyour computer. United Nations DevelopmentProgram site- this site contains a number of statistics on development one canview and download for further analysis. Networks link people and organizationstogether, greatly speeding up the process of communications. The Internetmakes expertise available regardless of time and distance, and provides accessto information at any location connected to the Internet. Companies canexpand their geographic scope electronically without having to open branchoffices. The Internet leads naturally to electronic commerce-creating newways to market, contract for, and complete transactions.

**Business in Digital Economy**

The digital economy is a global network of different commercial and social activities, which are enabled by technology such as the internet and mobile devices.

From a business point of view, the digital economy is a dynamic environment where an increasing number of goods and services are provided online. The digital economy can help you reach a targeted global audience and encourage them to interact with your business.

There are several key components that enable the digital economy. There's the technology infrastructure itself-the hardware, software and networks. There are the digital processes by which business happens, in other words, the [e-business](http://searchcio.techtarget.com/definition/e-business) component. Another key component is [e-commerce](http://searchcio.techtarget.com/definition/e-commerce), the digital transactions through which customers buy and obtain products and services from organizations.

The digital economy is sometimes called the [Internet](http://searchwindevelopment.techtarget.com/definition/Internet) economy, the new economy or Web economy. But some economists assert that the digital economy is more advanced and complex than the Internet economy, which, under one definition, simply means economic value derived from the Internet. Additionally, the term "digital economy" is not synonymous with earlier terms used to describe the technology-driven changes happening in 20th century economy, such as "information economy" and "network economy."

Billions of people are using social and digital communities to provide services, share insights, and engage in commerce. All the while, new channels for engaging with customers are created, and new ways for making better use of resources are emerging. It is these communities that allow companies to not only give customers what they want, but also align efforts across the business network to maximize value potential.

To seize the opportunities ahead, businesses must go beyond sensors, Big Data, analytics, and social media. More important, they need to reinvent themselves in a manner that is compatible with an increasingly digital world and its inhabitants (a.k.a. your consumers).

Here are a few companies that understand the importance of digital transformation – and are reaping the rewards:

**Under Armour:** No longer is this widely popular athletic brand just selling shoes and apparel. They are connecting 38 million people on a digital platform. By focusing on this services side of the business, Under Armour is poised to become a lifestyle advisor and health consultant, using his product side as the enabler.

[**Port of Hamburg**](http://www.digitalistmag.com/supply-chain/two-reasons-expand-operations-like-europes-second-largest-port-03207209)**:**Europe’s second-largest port is keeping carrier trucks and ships productive around the clock. By fusing facility, weather, and traffic conditions with vehicle availability and shipment schedules, the Port increased container handling capacity by 178% without expanding its physical space.

[**Haier Asia**](http://www.digitalistmag.com/innovation/company-disrupt-itself-gain-competitive-advantage-03517870)**:** This top-ranking multinational consumer electronics and home appliances company decided to disrupt itself before someone else did. The company used a two-prong approach to digital transformation to create a service-based model to seize the potential of changing consumer behaviors and accelerate product development.

[**Uber**](http://www.digitalistmag.com/big-data/ubers-big-data-effect-taxi-transportation-industry-03396123)**:**This startup darling is more than just a taxi service. It is transforming how urban logistics operates through a technology trifecta: Big Data, cloud, and mobile.

[**American Society of Clinical Oncologists (ASCO)**](http://www.digitalistmag.com/industries/precision-medicine-disrupt-entire-healthcare-system-03059474)**:**Even nonprofits can benefit from digital transformation. ASCO is transforming care for cancer patients worldwide by consolidating patient information with its Cancer LinQ. By unlocking knowledge and value from the 97% of cancer patients who are not involved in clinical trials, healthcare providers can drive better, more data-driven decision making and outcomes.