Management Information System

Final Year ILE

What Do Information Systems Have to Do with Business?

- How information systems provide the foundation for modern business enterprises.
- How real global businesses use technology and information systems to **increase their profitability, gain market share, improve their customer service, and manage their daily operations.**

Syllabus

- Organizational Strategy, Competitive Advantage
- Ethics and Privacy
- Information Security
- Data and Knowledge Management
- Telecommunications and Networking
- E-Business and E-Commerce
- Mobile Computing, and Mobile Commerce
- Social Computing
- CR Management and Supply Chain Management

Homo Conexus

- You are the most connected generation in history
- You practice continuous computing
- You are surrounded by a personal, movable information network

Homo Conexus

- **Your personal information network is created by constant cooperation between:**

  (1) the digital devices you carry;

  (2) the wired and wireless networks that you access as you move about;

  (3) Web-based tools for finding information and communicating and collaborating with other people.

Introduction To Information Systems

- Identify the reasons why being an informed user of information systems is important in today's world.
- Describe the various types of computer-based information systems in an organization.
- Discuss ways in which information technology can affect managers and non-managerial workers.
- Identify positive and negative societal effects of the increased use of information technology.

Information Systems: Concepts and Definitions

Data Item. Elementary **description** of things, events, activities and transactions that are recorded, classified and stored but are not organized to convey any specific meaning.

Information. Data organized so that they have **meaning** and value to the recipient.

Knowledge. Data and/or information organized and processed to convey understanding, **experience, accumulated learning and expertise** as they apply to a current problem or activity.

- Data items can be numbers, letters, figures, sounds, and images. Examples of data items are collections of numbers (e.g., 3.11, 2.96, 3.95, 1.99, 2.08) and characters (e.g., B, A, C, A, B, D, F, C).
- A grade point average (GPA) by itself is data, but a student's name coupled with his or her GPA is information. The recipient interprets the meaning and draws conclusions and implications from the information. Consider the examples of data provided in the preceding paragraph. Within the context of a university, the numbers could be grade point averages, and the letters could be grades in an Introduction to MIS class.
- For example, suppose that a company recruiting at your college has found over time that students with grade point averages over 3.0 have experienced the greatest success in its management program. Based on this accumulated knowledge, that company may decide to interview only those students with GPAs over 3.0.

Data	Information	Knowledge
[No context]	[University context]	
3.16	3.16 + John Jones = GPA	* Job prospects
2.92	2.92 + Sue Smith = GPA	* Graduate school prospects
4.39	4.39 + Kyle Owens = GPA	* Scholarship prospects, Dream
3.95	3.95 + Tom Elias = GPA	
[No context]	[Professional baseball pitcher context]	
3.16	95 3.16 + Ken Rice = ERA	
2.92	2.92 + Ed Dyas = ERA	* Keep pitcher, trade pitcher, or send pitcher to minor leagues
1.39	1.39 + Hugh Carr = ERA	* Salary/contract negotiations
3.95	3.95 + Nick Ford = ERA	

GPA = grade point average (higher is better).
ERA = earned run average (lower is better); ERA is the number of runs per nine innings that a pitcher surrenders.

04-08-2023

Define information technology (IT) and information systems (IS).

- **Information technology** refers to any computer-based tool that people use to work with information and to support the information and information-processing needs of an organization.
- An **information system** collects, processes, stores, analyzes, and disseminates information for a specific purpose

IT has transformed modern organizations, individuals and societies, the global economy, and our physical environment. In addition, IT is making our world smaller, enabling more and more people to communicate, collaborate, and compete, thereby levelling the digital playing field.

- When you graduate, you will either start your own business or work for an organization, whether it is public sector, private sector, for-profit, or not-for-profit.
- Your organization will have to survive and compete in an environment that has been radically transformed by information technology.
- This environment is global, massively interconnected, intensely competitive, 24/7/365, real-time, rapidly changing, and information-intensive. To compete successfully, your organization must use IT effectively

The Informed User—You!

- **Why you (every employee) should learn about information systems and information technologies?**

- First, you will benefit more from your organization's IT applications because you will understand what is "behind" those applications.
- Second, you will be in a position to enhance the quality of your organization's IT applications with your input.
- Third, even as a new graduate, you will quickly be in a position to recommend—and perhaps help select—the IT applications that your organization will use.
- Fourth, being an informed user will keep you abreast of both new information technologies and rapid developments in existing technologies. Remaining "on top of things" will help you to anticipate the impacts that "new and improved" technologies will have on your organization and to make recommendations on the adoption and use of these technologies.
- Fifth, you will understand how using IT can improve your organization's performance and teamwork as well as your own productivity.
- Finally, if you have ideas of becoming an entrepreneur, then being an informed user will help you use IT when you start your own business.

MIS provides what users see on their computer screens.

Managing information systems in modern organizations is a difficult, complex task – why?

- Several factors contribute to this complexity.

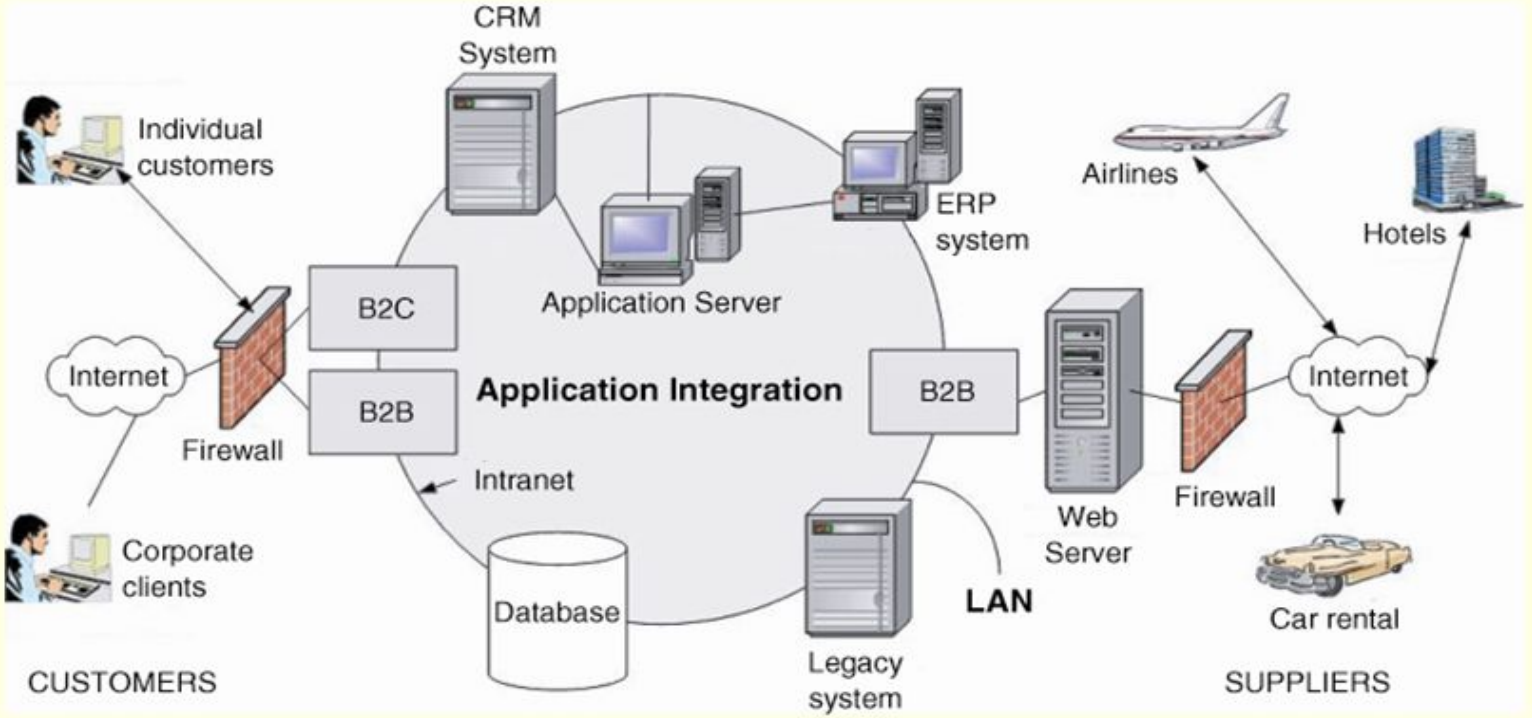
- First, information systems have enormous strategic value to organizations. Firms rely on them so heavily that, in some cases, when these systems are not working (even for a short time), the firm cannot function.
- Second, information systems are very expensive to acquire, operate, and maintain.
- A third factor contributing to the difficulty in managing information systems is the evolution of the management information systems (MIS) function within the organization.

Differentiate between Traditional and modern functions of MIS

Concepts and Definitions

- **Information Technology Architecture**. A high-level map or plan of the information assets in an organization, which guides current operations and is a blueprint for future directions.
- **Information Technology Infrastructure.** The physical facilities, IT components, IT services and IT management that support an entire organization.

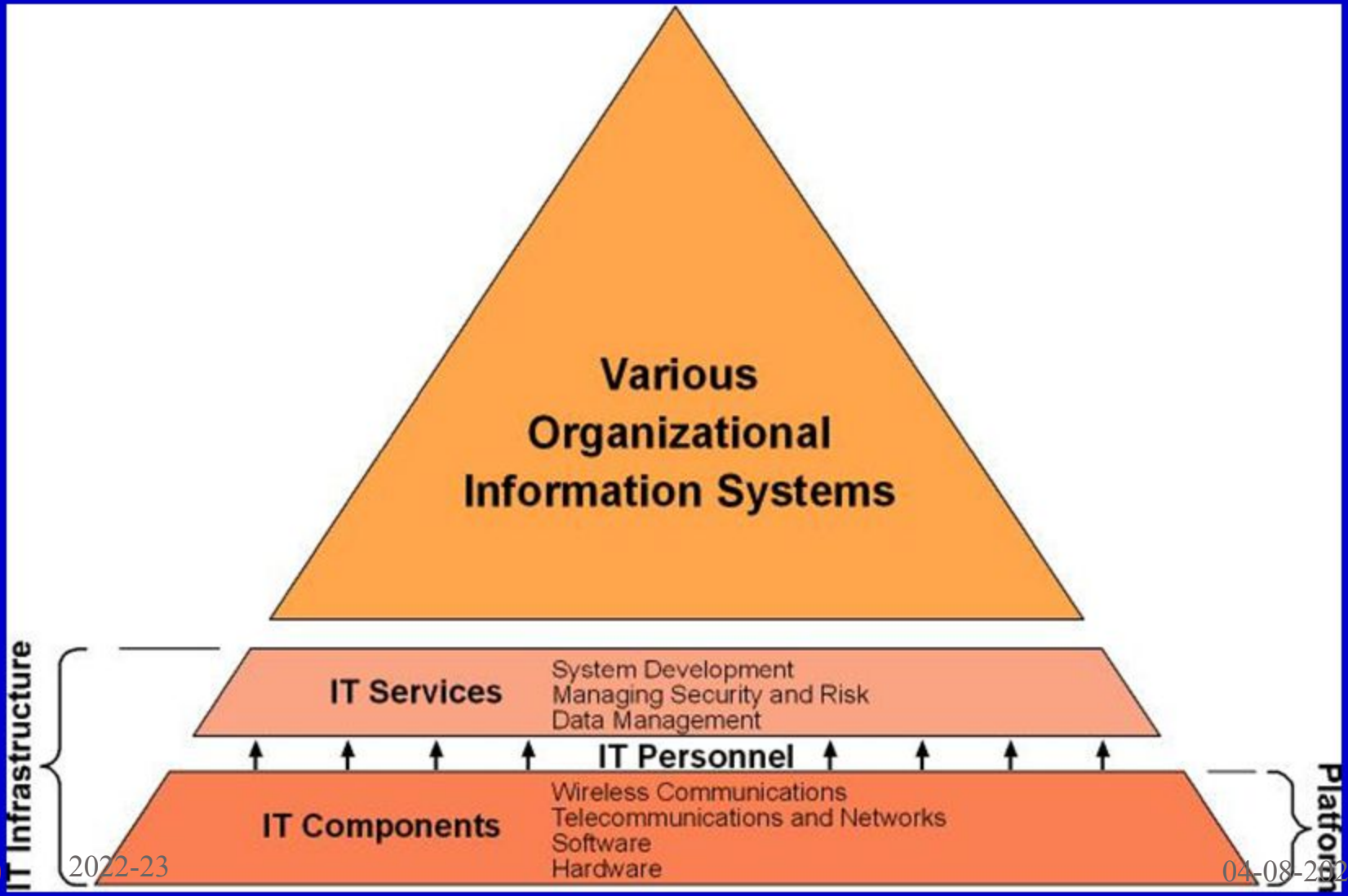
IT Architecture of Online Travel Agency



IT Components, IT Platform, IT Services, and IT Infrastructure

- **IT components consist of hardware, software, telecommunications and networks, and wireless communications.**
- **IT services consist of data management, managing security and risk, and systems development.**
- **IT personnel use IT components to produce IT services .**
- **IT infrastructure consists of IT components, IT personnel, and IT services.**

IT Components, Services, Platform, and Infrastructure



Components of MIS

- **Hardware** consists of devices such as the processor, monitor, keyboard, and printer. Together, these devices accept, process, and display data and information.
- **Software** is a program or collection of programs that enable the hardware to process data.
- **A database** is a collection of related files or tables containing data.
- A **network** is a connecting system (wired or wireless) that permits different computers to share resources.
- **Procedures** are the instructions for combining the above components to process information and generate the desired output.
- ***People*** *are those individuals who use the hardware and software, interface with it, or utilize* its output.

Overview of Computer-Based Information Systems

- A computer-based information system is an information system that uses computer technology to perform some or all of its intended tasks.
- Computer-based information systems have many capabilities. Some of them are listed below:

- Perform high-speed, high-volume numerical computations.
- Provide fast, accurate communication and collaboration within and among organizations.
- Store huge amounts of information in an easy-to-access, yet small space.
- Allow quick and inexpensive access to vast amounts of information worldwide.
- Interpret vast amounts of data quickly and efficiently.
- Automate both semiautomatic business processes and manual tasks.

©Dzianis Kazlouski/iStockphoto

Hardware

Procedures

Procedures

©Alex Slobodkin/iStockphoto

Database

©Blend_Images / iStockphoto

Computer-based information system

Procedures

Procedures

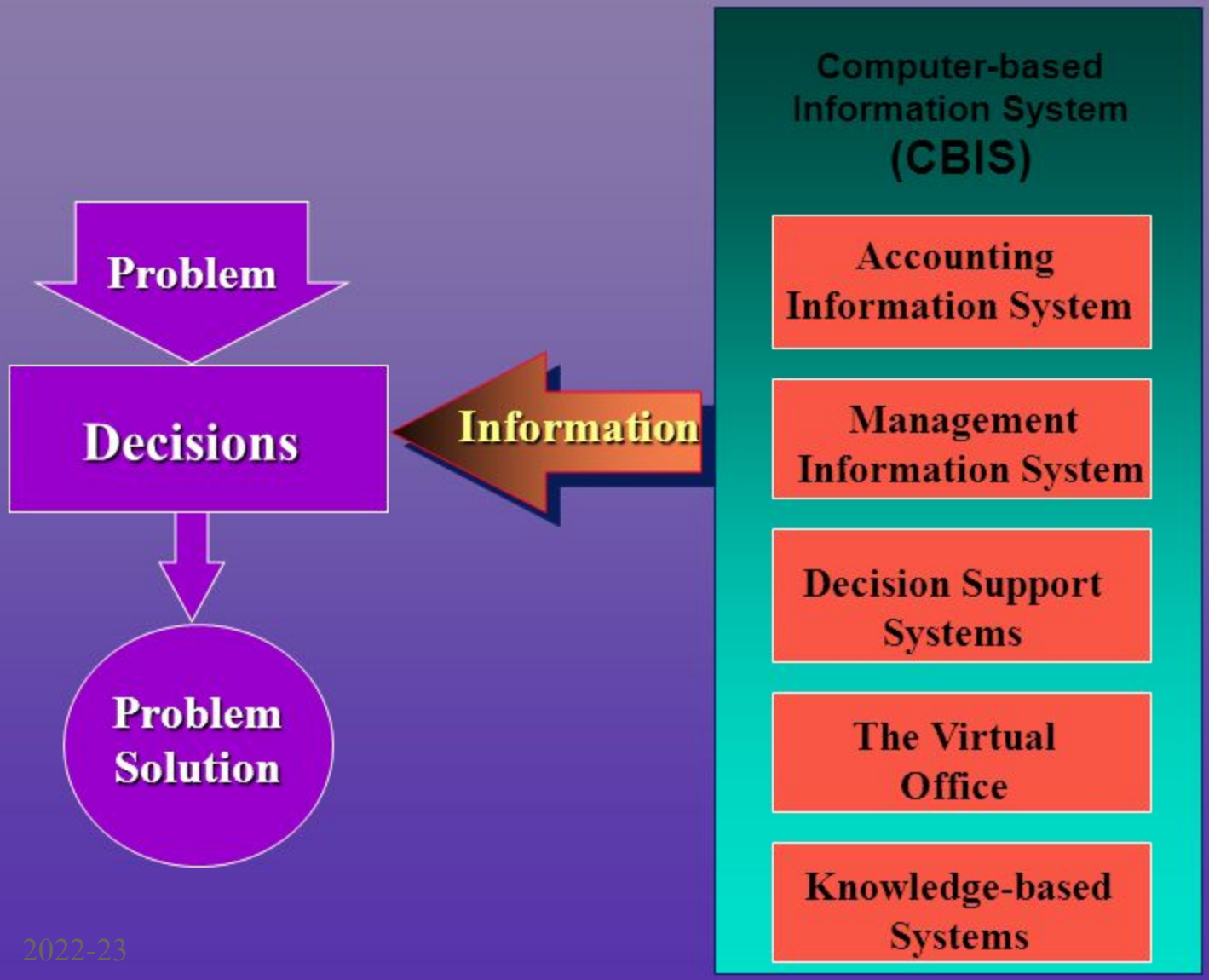
©Oleksiy Mark/iStockphoto

Software

©Alex Slobodkin/iStockphoto

Network

The CBIS Model



Information systems perform various tasks via a wide spectrum of applications:

- An **application (or app)** is a computer program designed to support a specific task or business process. Each functional area or department within a business organization uses dozens of application programs.
- The collection of application programs in a single department is usually referred to as a departmental information system (also known as a **functional area information system** (FAIS))

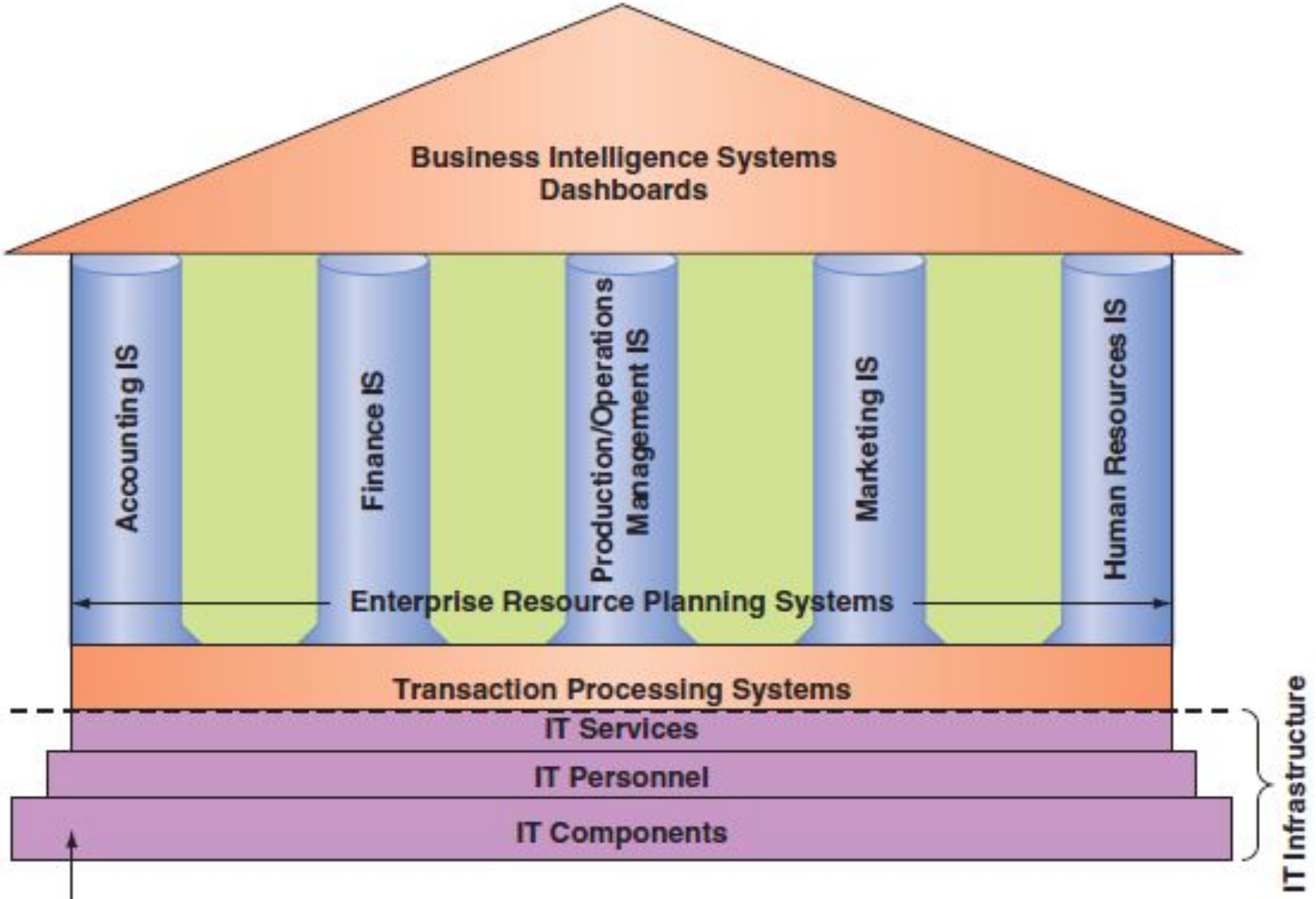
❖ *For example, the collection of application programs in the human resources area is called the human resources information system (HRIS).*

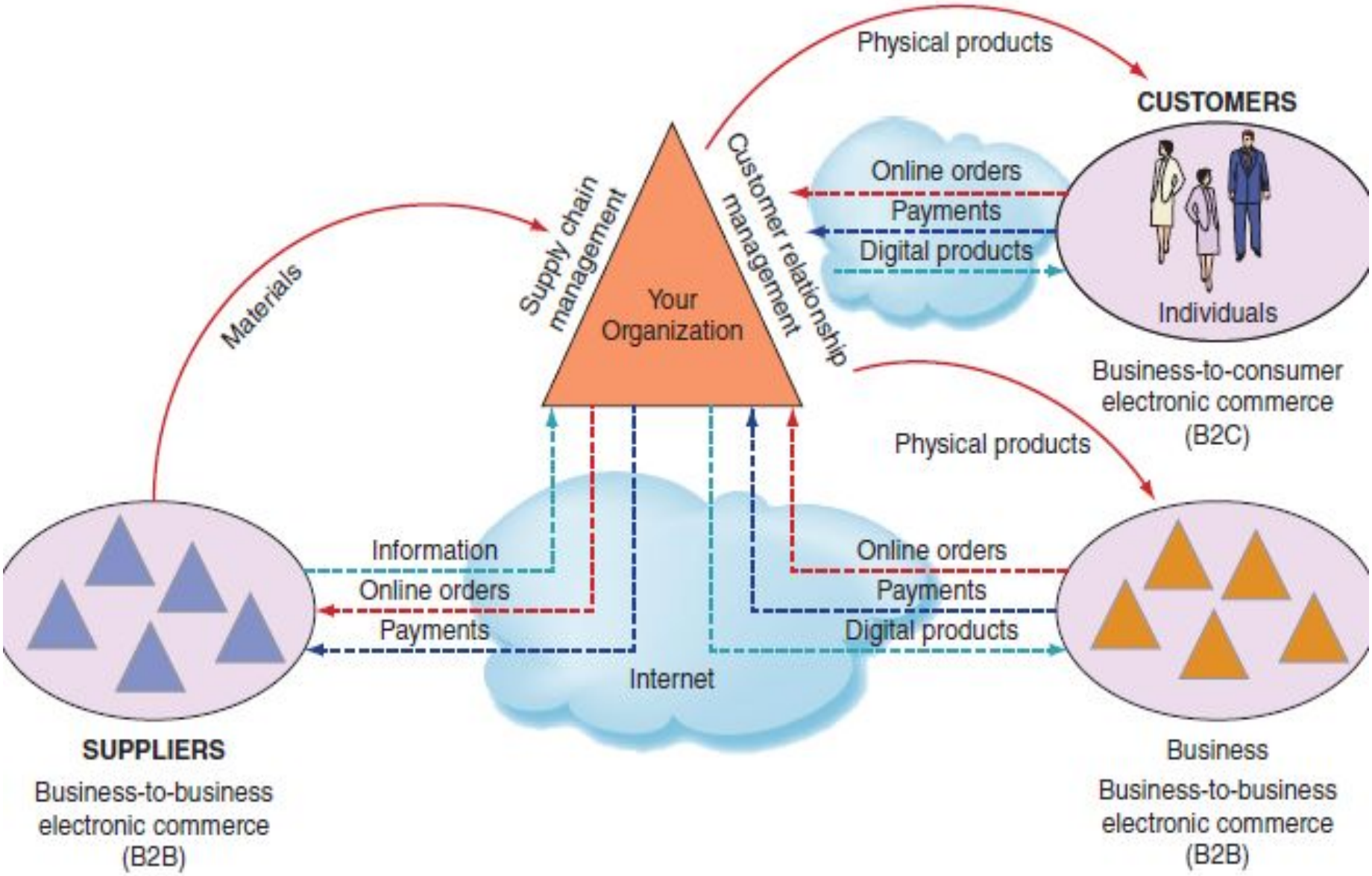
❖ *D*epartmental information systems—in the other functional areas as well, such as accounting, finance, marketing, and production/operations.

Types of Computer-Based Information Systems (IMPORTANT)

- Modern organizations employ many different types of information systems.
  - ✔ **Transaction processing systems (TPSs),**
  - ✔ **Management information systems, (MIS) and**
  - ✔ **Enterprise resource planning (ERP) systems**
  - ✔ **Customer Relationship Management (CRM) systems**
  - ✔ **and Supply Chain Management (SCM) systems**

- PS: (Slide26) illustrates the different types of information systems that function *within* a single organization, and Figure in (slide 27) shows the different types of information systems that function *among* multiple organizations. Addition material provided for explanations


Business Intelligence Systems
Dashboards
Accounting IS
Finance IS
Production/Operations Management IS
Marketing IS
Human Resources IS
Enterprise Resource Planning Systems
Transaction Processing Systems
IT Services
IT Personnel
IT Components
IT Infrastructure
Platform



Information systems that function among multiple organizations.

FAIS

- Consider some examples of IT systems in the various functional areas of an organization.

a. Why managers use IT in finance and accounting?
b. Why managers use IT in sales department?
c. Why managers use IT in marketing department?
d. Why managers use IT in HR department?

A transaction processing system (TPS)

- Supports the monitoring, collection, storage, and processing of data from the organization's basic business transactions, each of which generates data.

  Example: When you are checking out at DMart, a transaction occurs each time the cashier swipes an item across the bar code reader.

- A transaction is anything that changes the firm's database.

  Consider a scenario in which a student transfers from one section of an Introduction to MIS course to another section. This move would be a transaction to the university's information system, but not to the university's accounting department (the tuition would not change).

  - The TPS collects data continuously, typically in real time, that is, as soon as the data is generated and it provides the input data for the corporate database
  - TPSs are considered critical to the success of any enterprise because they support core operations.

Enterprise Resource Planning (ERP)

- Enterprise Resource Planning is software that integrates all departments and functions across a business into a single system while still serving each department's specific needs. It is designed to help businesses make smarter decisions, serve their customers better, and work more efficiently overall by **automating processes and workflows**.
- ERP software is important because it can facilitate the following:
  - ✔ Increase effective communication between departments
  - ✔ Allow employees to access information they need from anywhere
  - ✔ Streamline processes across various department
  - ✔ Provide a bird's eye view of a business' overall operations
  - ✔ Better manage a company's finances

ERP …

- ERP can be beneficial from a marketing standpoint because it helps you
  - **see how your business is doing** as a whole
  - **reveal areas of opportunity** where improvements can be made**.**
  - provides valuable **data and analytics** that will help you understand your customers better
  - will give you insight that you can use to tailor your **marketing strategy**.
  - It also makes it easier to communicate effectively with your customers and **provide better customer service**.

Other systems

- ERP systems and TPSs function primarily within a single organization.
- Information systems that connect two or more organizations are referred to as **interorganizational information systems** (IOSs)
- IOSs support many interorganizational operations, of which **supply chain management** is the best known.
  - An organization's supply chain is the flow of materials, information, money, and services from suppliers of raw materials through factories and warehouses to the end customers.
  - Information flows, financial flows, and digitizable products go through the Internet, whereas physical products are shipped.

Other systems …

- **Electronic commerce systems** are another type of interorganizational information system.
- **Office automation systems** (OASs) typically support the clerical staff, lower and middle managers, and knowledge workers.
- **Business intelligence systems** provide computer-based support for complex, non-routine decisions, primarily for middle managers and knowledge workers.
- These employees use OASs to develop documents (word processing and desktop publishing software), schedule resources (electronic calendars), and communicate (e-mail, voice mail, videoconferencing, and groupware)

These systems enable organizations to conduct transactions, called business-to-business (B2B) electronic commerce, and customers to conduct transactions with businesses, called business to-consumer (B2C) electronic commerce. E-commerce systems typically are Internet based.

Other systems

- **Expert systems (ES)** attempt to duplicate the work of human experts by applying reasoning capabilities, knowledge, and expertise within a specific domain.

  They have become valuable in many application areas, primarily but not exclusively areas involving decision making. For example, navigation systems use rules to select routes, but we do not typically think of these systems as expert systems. Significantly, expert systems can operate as standalone systems or be embedded in other applications.

- **Dashboards (also called digital dashboards**) are a special form of IS that support all managers of the organization. They provide rapid access to timely information and direct access to structured information in the form of reports. Dashboards that are tailored to the information needs of executives are called executive dashboards

Type of System	Function	Example
Functional area IS	Supports the activities within specific functional area	System for processing payroll
Transaction processing system	Processes transaction data from terminal	Walmart checkout point-of-sale business events
Enterprise resource planning	Integrates all functional areas of the organization	Oracle, SAP system
Office automation system	Supports daily work activities of individuals and groups	Microsoft® Office
Management information system	Produces reports summarized from transaction data, usually in one functional area	Report on total sales for each customer
Decision support system	Provides access to data and analysis tools	"What–if" analysis of changes in budget
Expert system	Mimics human expert in a particular area and makes decisions	Credit card approval analysis
Executive dashboard	Presents structured, summarized information about aspects of business important to executives	Status of sales by product
Supply chain management system	Manages flows of products, services, and information among organizations	Walmart Retail Link system connecting suppliers to Walmart
Electronic commerce system	Enables transactions among organizations and between organizations and customers	*www.dell.com*

Support for Organizational Employees

- ***Clerical workers*****,** who support managers at all levels of the organization, include bookkeepers, secretaries, electronic fi le clerks, and insurance claim processors.
- ***Lower level managers*** handle the day-to-day operations of the organization, making routine decisions such as assigning tasks to employees and placing purchase orders.
- ***Middle managers*** make tactical decisions, which deal with activities such as short-term planning, organizing, and control.
- **Knowledge workers** are professional employees such as financial and marketing analysts, engineers, lawyers, and accountants. All knowledge workers are experts in a particular subject area. They create information and knowledge, which they integrate into the business. Knowledge workers, in turn, act as advisors to middle managers and executives.
- ***Executives*** make decisions that deal with situations that can significantly change the manner in which business is done.

How Does IT Impact Organizations?

- **IT Impacts Entire Industries:** Software is impacting every industry, and every organization must prepare for these impacts
- As of now, the technology required to transform industries through software had been developed and integrated and could be delivered globally.
- Software tools and Internet-based services enabled companies in many industries to launch new software- powered startups without investing in new infrastructure or training new employees.
- A few examples of software disruption across several industries.
- Many of these examples focus on two scenarios:

  (1) industries where software disrupted the previous market-leading companies and

  (2) industries where a new company (or companies) used software to achieve a competitive advantage.

How Does IT Impact Organizations?

- *The book industry*:
- *The music industry*:
- *The video industry:*
- *The software industry:*
- *The videogame industry:*
- *The photography industry*:
- *The marketing industry:*
- *The recruiting industry:*
- *The financial services industry:*
- *The motion picture industry:*

How Does IT Impact Organizations?

- Software is also disrupting industries that operate primarily in the physical world. Consider these examples:

  - *The automobile industry:*
  - *Fundraising;*
  - *Genomics;*
  - *The agriculture industry:*
  - *National defense:*
  - *The fashion industry:*
  - *Education:*
  - *The legal profession:*

Questions

- **What is a computer-based information system?**
- **Describe the components of computer-based information systems.**
- **What is an application program (app)?**
- **Explain how information systems provide support for knowledge workers.**
- **As we move up the organization's hierarchy from clerical workers to executives, how does the type of support provided by information systems change?**
- **How IT impacts the society?/ List positive and negative societal effects of the increased use of information technology.**

IT's about [small] business

- Case Study - Warby Parker

Warby Parker (www.warbyparker.com) is an online eyewear retailer that was founded in 2010. The idea for the company was conceived when the firm's founders (MBA students at the time) observed that glasses—uncomplicated, easily breakable, and mass-produced—were typically quite expensive ($500 or more, for example). Significantly, the founders were convinced they knew the reason why glasses cost so much. They perceived the optical industry as **an oligopoly**, meaning that *a small number of companies dominate the business and are making large margins*

- Consider, for example, Luxottica (www.luxottica.com), based in Milan, Italy. This company owns LensCrafters, Pearle Vision, Sunglass Hut, Ray-Ban, Oakley, and Oliver Peoples, in addition to the optical shops in Target and Sears.
- In addition, as a result of **a series of license agreements**, Luxottica manufactures eyewear for more than 20 top brands, including Chanel, Burberry, Prada, and Stella McCartney. Warby Parker's founders realized that Luxottica had "created the illusion of choice," when in fact they practically monopolized the industry.

- Warby Parker devised a strategy to compete with Luxottica.
- The company uses the same materials and the same Chinese factories as Luxottica. It then sells its glasses at a lower price because it does not have to pay licensing fees, which can amount to as much as 15 percent of the $100 wholesale cost of a pair of glasses.
- In addition, because Warby Parker markets and sells its products directly to its customers, it does not have to deal with retailers, whose markups can double prices.

Warby Parker's business model

- Warby Parker's business model allows customers to test the company's retro-style glasses via a mail-order, try-it-at-home program. The glasses (including prescription lenses) cost a mere $95, and customers may test up to five frames at a time. In addition, the Warby Parker Web site enables shoppers to upload photos and "try on" frames virtually. Such large-scale individualized shopping experiences have attracted a devoted following among young, trendy professionals. This business model has made the fi rm a commercial success

Success story..

- By mid-2013, Warby Parker had sold more than 100,000 pairs of glasses. The company raised $1.5 million from investors in May 2011, and in 2012 it raised an additional $37 million. It has 113 employees, and it opened a 2,500-square-foot store in New York City.
- In addition to enjoying great commercial success, Warby Parker has a social mission. For every pair of glasses it sells, it provides subsidies to help someone in need to buy a pair—although not one of Warby's creations.
- The company's success is **inspiring competition** from more established eyeglass retailers. For example, discount fashion site Bluefly (www.bluefly.com) has introduced Eyefl y (www.eyefl y .com), which sells custom, vintage-looking glasses for $99

- Another competitor is Ditto (www.ditto.com), where shoppers use a computer webcam to record a video of their faces and create a virtual, three-dimensional "you." Then, shoppers can virtually try on different frames, look side to side, and blink. They can also solicit feedback from friends on Facebook by sharing shots of their virtual selves wearing different frames.
- Google wants to avoid making users of its Google Glass product look like an actor in a science fiction movie. As a result, the company is working with Warby Parker to design more fashionable frames for Google Glass.
- **Questions**
- 1. Provide two examples of how Warby Parker uses information technology to support its business model.
- 2. How might Warby Parker further use information technology to counter large competitors who want to copy their business model? Be specific.

How Does IT Impact Organizations?

- IT Reduces the Number of Middle Managers
- IT Changes the Manager's Job
- Will IT Eliminate Jobs?
- IT Affects Our Quality of Life
- Improvements in Healthcare
- IT Impacts Employees at Work
  - *IT Impacts Employees' Health and Safety.*
  - *IT Provides Opportunities for People with Disabilities.*
    - The Robot Revolution Is Here Now

Negative effects of IT on quality of life

- Through IT and its devices, the privacy has become limited as user may be controlled by these technologies. For example: CCTV cameras can be used to see in shop or any business place.
- For using conventional tools of technology user has to pay some amount. For example: User has to pay money to get access to the internet.
- There is risk of information lost during any physical damage to the devices or by viruses. For example: If the window crashes due to any reason.
- By the use of IT technologies the number of employees may reduce.

For example: one computer can do the work of hundred persons in one time.

Activity

- Banking Industry Information Systems impact every facet of an organization. This is especially true in the banking industry. Information Systems have revolutionized the way customers interact with banks, pay bills, manage accounts, and more. Information Systems now make it easier to communicate with customers via e-statements, use databases make loan decisions, monitor account status, and much, much more.
- For this Activity, you will work for Noble Bank & Trust and bring the Bank into the "21st Century" in regards to technology. In some cases, this requires a complete overhaul of hardware, software, and user training. Do some research on the web to see if you can find examples of how other banks have implemented Information Systems to their advantage.
- www.nelito.com/digital-banking/internet-banking-solution.html

Classwork

- Does IT Affect Our Quality of Life
- The Robot Revolution Is Here Now: Describe Robotic revolution. Consider its implications on Humans
- Improvements in Healthcare

Different Types of Robots

- **Telepresence robots.** Telepresence robots are designed to help companies save money on travel and on expensive teleconferencing technology.
- Many start-up companies are developing telepresence robots. Let's take a look at some of them.

  • Oculus, made by Xaxxon Technologies (www.xaxxon.com), is utilized primarily for security patrols. The robot is essentially a set of wheels for a laptop that runs Skype videoconferencing software. Oculus can be controlled with a smartphone.

  • In December 2012, a start-up called Robotics Valley (www.roboticsvalley.com), began manufacturing a $300 three wheeled telepresence robot called Botiful. Botiful is remotely piloted, it carries an Android-based smartphone, and streams video via Skype.
- **Autonomous Cars.** *Autonomy* is commonly defi ned as the ability of a machine to make decisions without human intervention. The best-known example of an autonomous, or self-driving, car is the Google driverless car.
- *Audi, Toyota, and Cadillac, among other car brands, are developing autonomous cars as well. It is worth noting that each of Google's driverless test cars contains about $150,000 in equipment. With so many automobile manufacturers developing autonomous cars, the price will undoubtedly drop quickly.*

Different Types of Robots

- **Drones.** An unmanned aerial vehicle (UAV), commonly known as a drone, is an aircraft that does not have a human pilot on board. Its flight is controlled either autonomously by computers contained in the vehicle or via remote control by a pilot located either on the ground or in another vehicle.
- **Questions**

1. Discuss some disadvantages of (a) telepresence robots; (b) autonomous cars; and (c) drones.

2. Would you be willing to ride in an autonomous car? Why or why not?

3. Which occupations are most at risk from a widespread adoption of autonomous cars? Support your answer.

4. Debate the privacy issues