Introduction to Information Technology

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Chapter 2

Information Technologies: Concepts and Management

Chapter Outline

- Information System: Concepts and Definition
- Evolution of Information System
- Classification of Information Systems
- Examples of Information Systems
- The Modern Computing Environment
- Web-based Systems
- Emerging Computing Environments
- Managing Information Resources

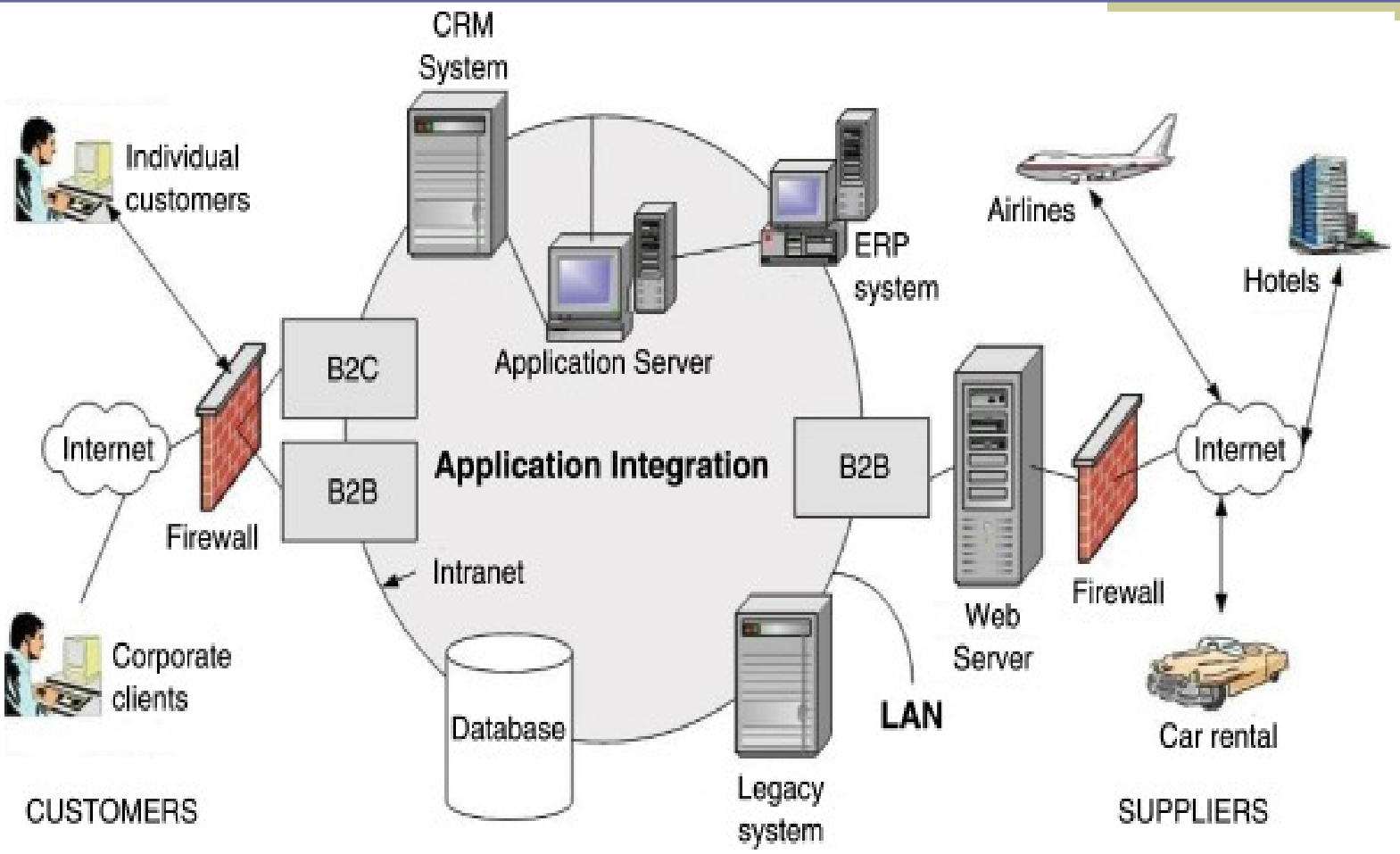
Learning Objectives

- Differentiate between information technology infrastructure and information technology architecture .
- Describe the components of computer- based information systems.
- Describe various information systems and their evolution.
- Compare mainframe- based legacy systems, C/S systems and peer-to-peer
- Identify the major internal support system for each organization level
- Describe the major types of web- based information systems and understand their functions.
- Describe the emerging computing environments.
- Describe how information resources are managed and the roles of the information systems department and the end users.

2.1 Information Systems: 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.
- In preparing the IT architecture, the designer needs similar information, which can be divided into two part:
  - The business needs for information
  - The existing and planned IT infrastructure and applications of the organization.

The IT architecture of an e-business



Information Technology Infrastructure

- The physical facilities, IT components, IT services, and IT management that support an entire organization.
- IT components are the computer hardware, software and communications technologies that are used by IT personnel to produce IT services.
- IT services include data management systems development , and security concerns .
- IT infrastructure include these resources as well as their integration, operation, documentation, maintenance and management.

Information Technology (IT)

- Broadly , an organization's collection of information resources, their users, and the management that oversees them; includes the IT infrastructure and all other information systems in an organization.

Computer- Based Information Systems

- Information System (IS): A Process that collects, processes, stores, analyzes, and disseminates information for a specific purpose.
- Computer Based information system (CBIS): an information system that uses computer technology to perform some or all of its intended tasks.

Application Program

- A computer program designed to support a specific task, a business process , or another application program.
- The collection of application programs in a single department is usually considered a departmental information system.

Data, Information, and Knowledge

- Data items. An 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 that have been organized to that they have meaning and value to the recipient.
- Knowledge. Data and/ or information that have been organized and processed to convey understanding, experience, accumulated learning, and expertise as apply to a current problem or activity.

2.2 Evolution of Information System

- The first business application of computers(in the mid- 1950s) performed repetitive. High-volume, transaction –computing tasks. The computers" crunched numbers" summarizing and organizing transactions and data in the accounting, finance, and human resources areas. Such systems are generally called transaction processing systems (TPSs)

Evolution of IS cont…

- Management Information Systems (MISs): these systems access, organize, summarize and display information for supporting routine decision making in the functional areas.
- Office Automation Systems(OASs): such as word processing systems were developed to support office and clerical workers.
- Decision Support Systems: were developed to provide computer based support for complex, nonroutine decision.

Evolution of IS cont…

- End- user computing: The use or development of information systems by the principal users of the systems' outputs, such as analysts, managers, and other professionals.

Evolution of IS cont…

- Intelligent Support System (ISSs): Include expert systems which provide the stored knowledge of experts to nonexperts, and a new type of intelligent systems with machine-learning capabilities that can learn from historical cases.

Evolution of IS cont…

- Knowledge Management Systems: Support the creating, gathering, organizing, integrating and disseminating of an organization knowledge.
- Data Warehousing: A data warehouse is a database designed to support DSS, ESS and other analytical and end-user activities.

Evolution of IS cont…

- Mobile Computing: Information systems that support employee who are working with customers or business partners outside the physical boundaries of their companies; can be done over wire line or wireless networks.

2.3 Classification of Information Systems

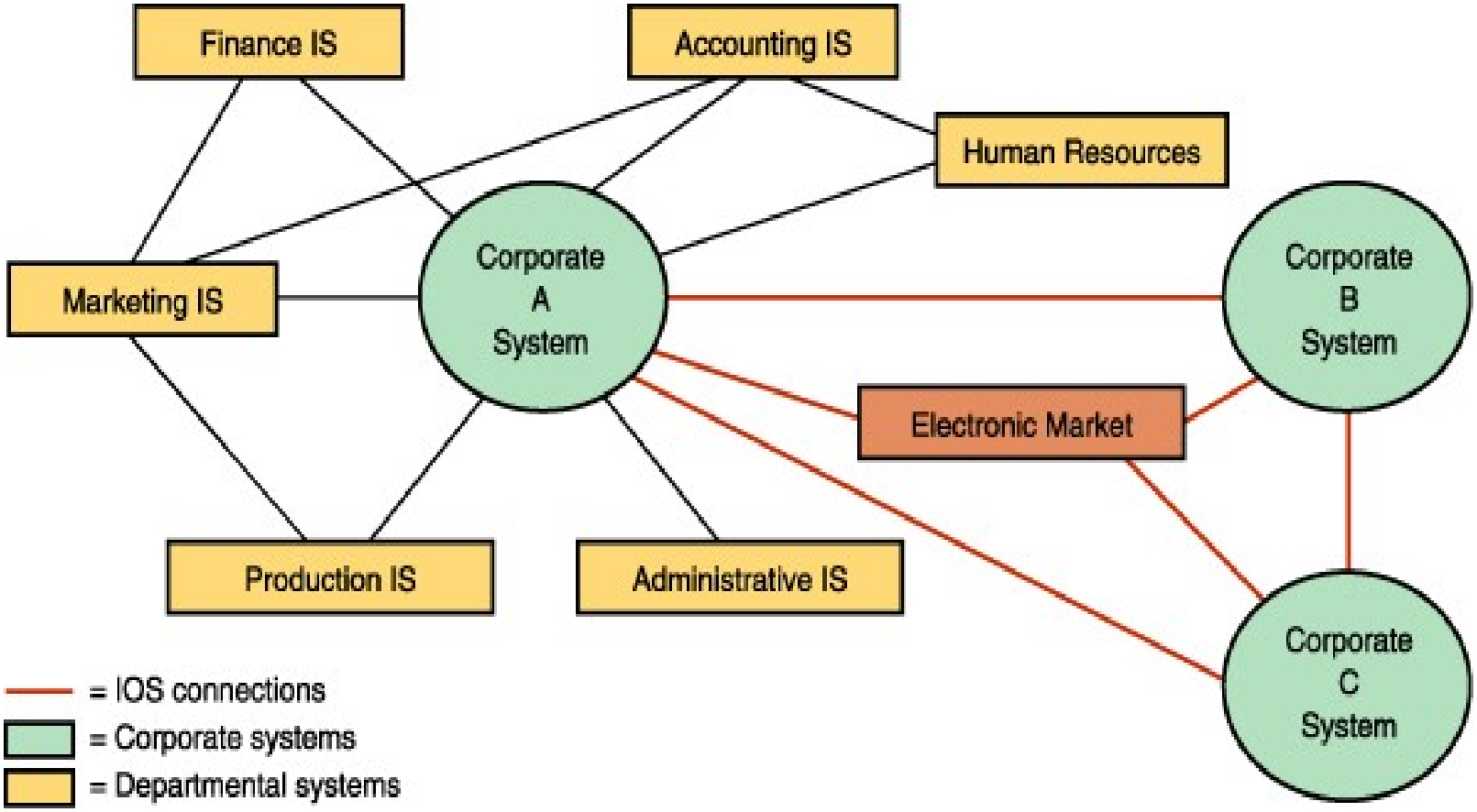
The two most common classifications are:

- Classification by breath of support
- classification by organizational level .

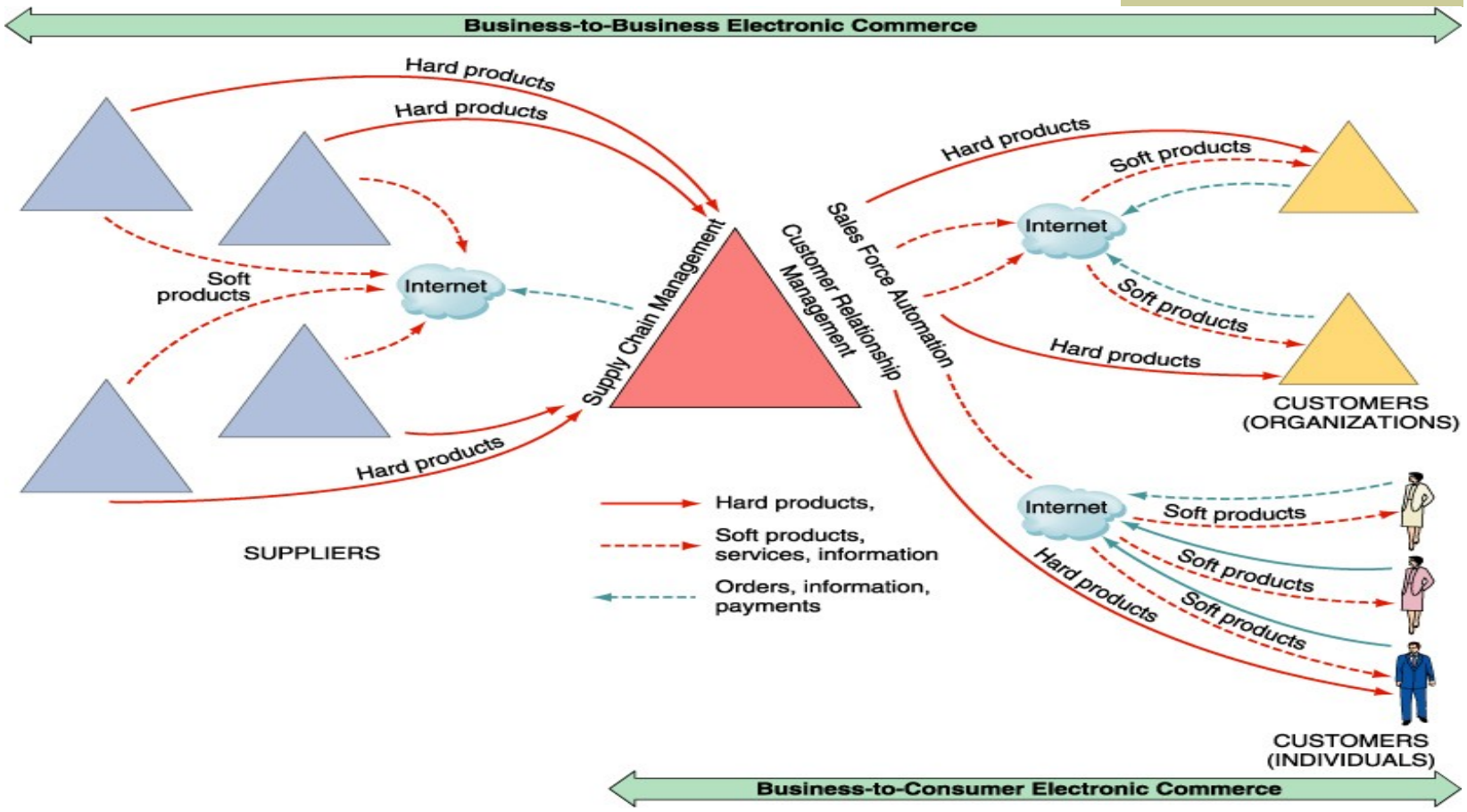
Classification by Breath of Support

- Typical information systems that follow the hierarchical organization structure are functional (departmental) enterprisewide and interorganizational
  - Functional information systems are organized around the traditional departments.
  - Enterprise information systems serve several department or the entire enterprise.
  - Interorganizational systems connect two or more organizations.
  - An organization's supply chain describe the flow of materials , information money and service from raw material suppliers through factories and warehouses to the end customers.
  - IT provide two major types of software solution for managing supply chain activities . First enterprise resource planning (ERP), Second Supply Chain Management (SCM)

Departmental, corporate, and interorganizational IS



IT outside your organization



Classification by Organization Levels

- The typical enterprise is organized hierarchically, from the clerical and office worker layer, to the operational layer, the managerial layer, the knowledge worker layer and finally the strategic layer.

The Clerical Level

- Clerical workers constitute a large class of employee who support managers at all levels of the company. Among clerical workers, those who use, manipulate, or disseminate information are referred to as data workers. These employee include bookkeepers, secretaries who work with word processors, electronic file clerks, and insurance claim processors.

The Operational Level

- Operational, or first- line managers deal with the day-to day operations of the organization, making routine decision, which deal in general with activities such as short- term planning, organizing, and control

The Knowledge-Work Level

- They act as advisors and assistants to both top and middle management and are often subject-area experts. Many of these professional workers are classified as knowledge workers, people who create information and knowledge as part of their work and integrate it into the business.

The Strategic Level

- Top-level or strategic managers(the executive) make decision that deal with situation that may significantly change the manner in which business is done.

2.5 Computing Environment

- Computing Environment: The way in which an organization's information technologies (hardware, software, and communications technology) are organized and integrated for optimal efficiency and effectiveness.
- Legacy system: Older systems, typically those that process an organization's high-volume transactions, that are central to the operations of a business.

Distributed Computing

- Computing architecture that divides the processing work between two or more computers, using a network for connection, also called distributed processing.

Client / server architecture

- A type of distributed architecture that divides distributed computing units into two major categories, clients and servers, connected by a network .
- Client .A computer (such as a PC attached to a network) that is used to access shared network resources.
- Server. A computer that is attached to a client/server network and provides clients with variety of services.

Client/Server Architecture cont…

- Enterprise wide computing. Computing environment in which each client/ server architecture is used throughout an organization.
- Peer- to – Peer (P2P). A distribute computing network in which each client/ server computer shares files or computer resources directory with others but not through a central service (as in traditional client/ server architecture).

2.6 Web-Based Systems

- Web based systems: Applications or service that are resident on a server that is accessible using a web browser and is therefore accessible from anywhere via the internet.
- Internet (“ the Net”): a world wide system of computer – a network of networks; a public, cooperative and self- sustaining facility accessible to hundreds of millions of people worldwide.
- Information Superhighway. A national fiber-optic-based network and wireless infrastructure that will connect all internet users in a country

World Wide Web

- An application that uses the transport functions of the Internet; has universally accepted standards for storing, retrieving formatting, and displaying information via a client/server architecture

Intranet

- A private network, usually within one enterprise that uses web technologies such as browsers and internet protocols separated from the Internet by a security gateway such as a firewall

Extranet

- A secured network that connects several intranet via the Internet; allows two or more enterprise to communicate and collaborate in a controlled fashion .

Corporate portal

- Web site that provide the gateway to corporate information from a single point of access.

Web-Based E-Commerce Systems

- Electronic Storefront: The web- equivalent of a showroom or a physical store through which an e-business can display and/or sell its products.
- Electronic market: A network of interaction and relationships over which information, products service and payments are exchanged.

Web-Based E-commerce cont…

- Electronic exchange: A web based public electronic market in which many buyer and many sellers interact electronically .
- Mobile commerce: The buying and selling of goods and services in a wireless environment.
- Location based commerce: M–commerce transaction targeted to customers in specific locations at specific times.
- Enterprise Web: An open environment for managing and delivering web application by combining service from different vendors in a technology layer that spans platform and business systems.

2.7 Emerging Computing Environment

- Utility computing: Unlimited computing power and storage capacity that, like electricity and water services, can be obtained on demand from virtual utilities around the globe.
- Subscription computing: A type of utility computing that puts the pieces of a computing platform together as services, rather than as a collection of separately purchase component .
- Grid computing: The use of networks to harness unused processing cycles of various computers in order to create powerful computing capabilities.

Emerging Computing cont…

- Pervasive computing: invisible, everywhere computing that is embedded in objects around us.
- Web services: Universal, prefabricated business process software modules, delivered over the Internet that users can select and combine through almost any device enabling disparate system to share data and services.

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