

Chapter 1 / 2



# **IT Support of Organizational Performance / Information Technologies: Concepts and Management**

**Information Technology For Management 7<sup>th</sup> Edition**

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Based on lecture slides by L. Beaubien, Providence College

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# Learning Objectives



- Describe the digital economy and digital enterprises
- Recognize the relationship between performance, organizational pressures, and responses and technology
- Define Information Systems and the difference between data, information and knowledge
- Understand what the adaptive enterprise is

# Learning Objectives (continued)

- Understand the support role that IS and IT play in the organization
- Understand the importance of learning about IT

# Information Systems

- Discipline concerned with the strategic, managerial and operational activities involved in the gathering, processing, storing, distributing and use of information, and its associated technologies, in society and organizations
- IS deals with human made technological artifacts (computerized systems) in a non-technological setting (human organizations)
- Includes software, hardware, data, people, and procedures - Interdisciplinary field - Not (purely) technical

*IS is not computer science / engineering!*

# Information Systems

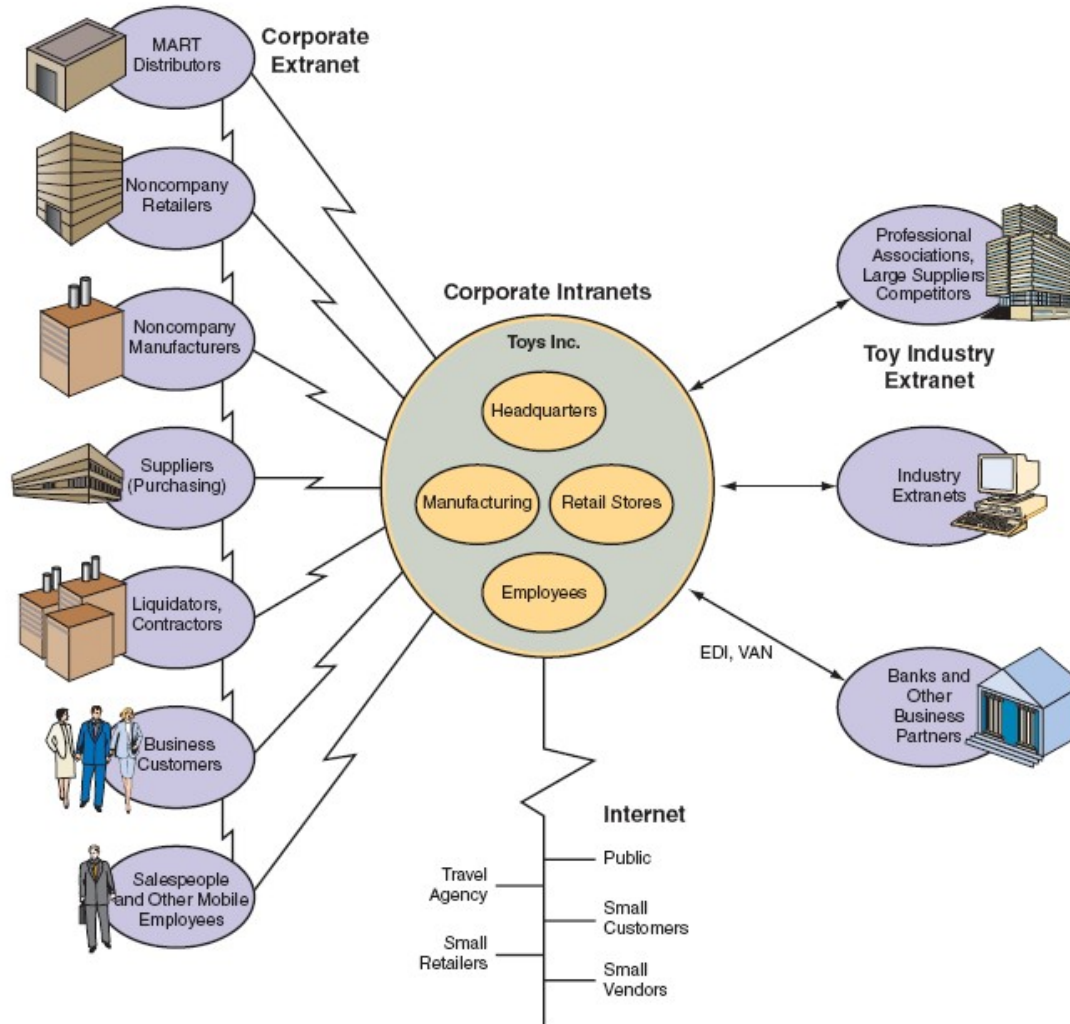


- Information systems are implemented within an organization for the purpose of improving the effectiveness and efficiency of that organization.
- Capabilities of the information system and characteristics of the organization, its work systems, its people, and its development and implementation methodologies together determine the extent to which that purpose is achieved.

# Digital Economy – “New” Economy

- Economy based on digital technologies (Internet economy, new economy, web economy)
  - E-Business: The use of electronic technologies to transact business
  - Collaboration: People and organizations interact, communicate, collaborate, and search for information
  - Information Exchange: Storing, processing and transmission of information

# Digital Business



# New Economy vs. Old Economy

- Example #1: Registering for Classes
  - Old Economy: You would go to the Registrar's Office on campus with a paper registration document
  - New Economy: You access your campus website, log into registration site, and electronically register for classes from anywhere



# New Economy vs. Old Economy

- Example #2: Buying and Selling Textbooks
  - Old Economy: You go to the bookstore in person and buy new or sell used books
  - New Economy: You go online to the Publisher's Web site or to Web-based services such as Amazon.com to buy or sell books

# New Economy vs. Old Economy

- Example #3: Photography
  - Old Economy: You use a camera with film, which you have to purchase and have developed; you mail copies of pictures.
  - New Economy: You can scan photos, make copies and e-mail them. Digital cameras require no film or processing. Digital photography and video integrated into cell phones for immediate viewing

# New Economy vs. Old Economy

- Example #4: Paying for Transportation
  - Old Economy: Use tokens for bus and subway transportation
  - New Economy: Bus and subway riders now use MetroCards; contactless cards that have a small radio transmitter that transmit account information to a reader

# New Economy vs. Old Economy

- Example #5: Paying for Goods, Checkout
  - Old-old Economy: Customer selects goods, waits in line for the cashier to key in price of items, and then pays in cash
  - Old Economy (1): The clerk swipes the barcode of each item and customer pays in cash, credit, or debit. Information scanned is available for immediate analysis known as *source-data automation* (inventory levels are updated, Walmart, POS)

# New Economy vs. Old Economy

- Example #6: Paying for Goods, Checkout continued
  - Old Economy (2): Shoppers take their items to a self-service kiosk and swipe the barcodes themselves
  - New Economy: Wireless technology affixed to each item. Allows you to select items that pass through a scanner, which reads wireless signal, generates a bill, automatically debits your designated account for payment and you leave.
- Example #7: Banking

# Activity



- Check out MIT Technology Review Breakthrough Technologies 2014 and 2015
  - <http://www.technologyreview.com/lists/technologies/2014/>
  - <http://www.technologyreview.com/lists/technologies/2015/>
- Generate an idea how one of these can be used at Bogazici University...

# Business Models

- A **business model** is a method of doing business by which a company can generate revenue to sustain itself. The model spells out how the company adds value to create a product or service. (DELL vs HP)
  - Reverse Auctions
  - Affiliate Marketing
  - Electronic aggregation (buying groups)
  - Infomediation

# Business Performance Management

- Step 1: Decide on desired performance levels (Where do we want to go? Mission, goals and metrics)
- Step 2: Determine how to attain the performance levels (How do we get there? Strategy and plans)
- Step 3: How well are we doing? Monitoring performance
- Step 4: Adjust performance/goals (How can we improve? How do we close the gap? Solutions and responses)
- IT can support all of these steps...



# Drivers Forcing Changes In Business Models

## Business Pressures

- Environmental, organizational, and technological factors
- React frequently and quickly to both the *threats* and the *opportunities* resulting from this new business environment

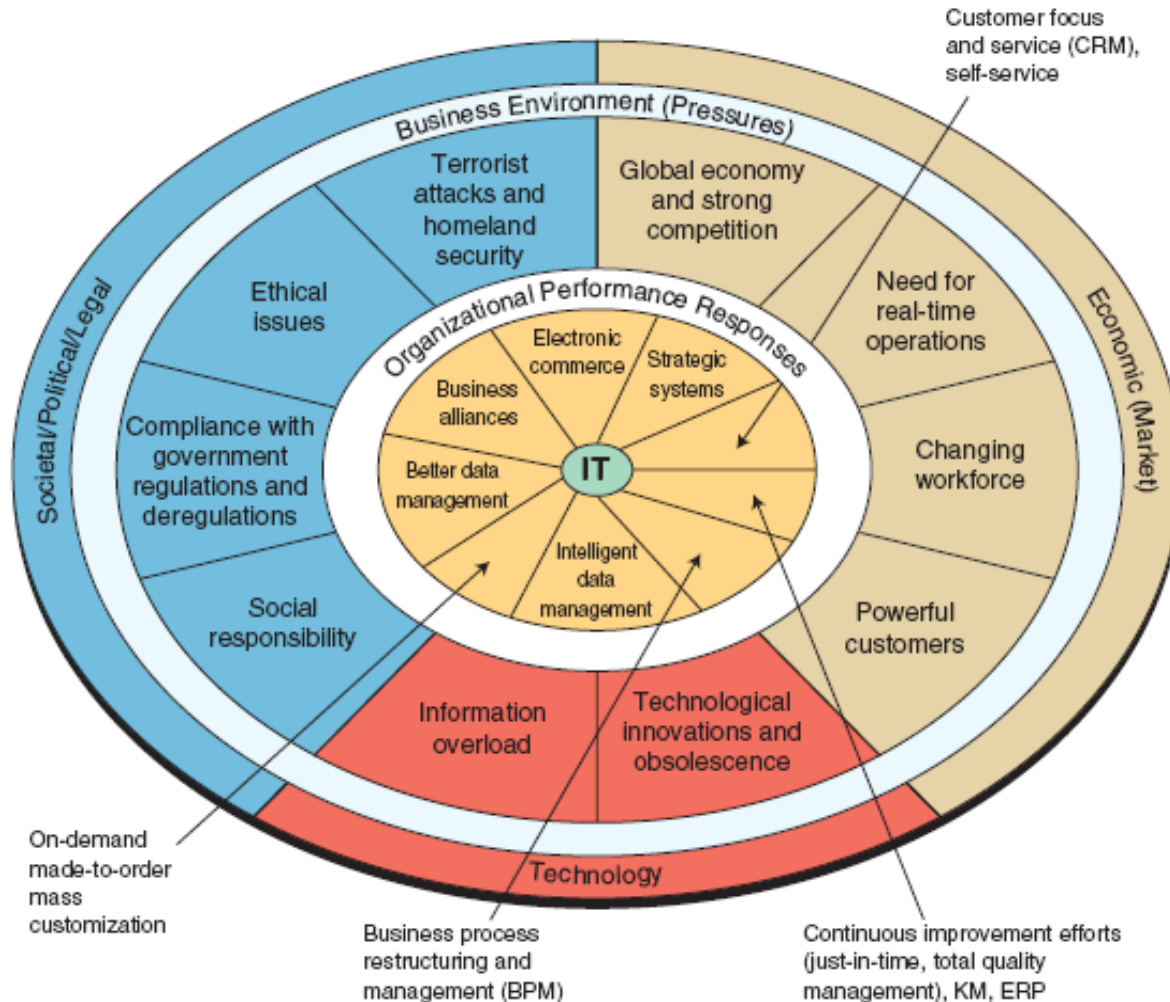
## Business Critical Response Activities

- A response can be a reaction to a pressure already in existence, an initiative intended to defend an organization against future pressures, or an activity that exploits an opportunity created by changing conditions

# Business Pressures, Organizational Responses, and IT Support

- **Business Pressure** - The business environment is the combination of social, legal, economic, physical, and political factors that affect business activities
- Significant changes in any of these factors are likely to create business pressure on the organization
- The three types of business pressures faced are: *market, technology, and societal pressures.*

# The Drivers of Change (continued)



# The Adaptive Enterprise

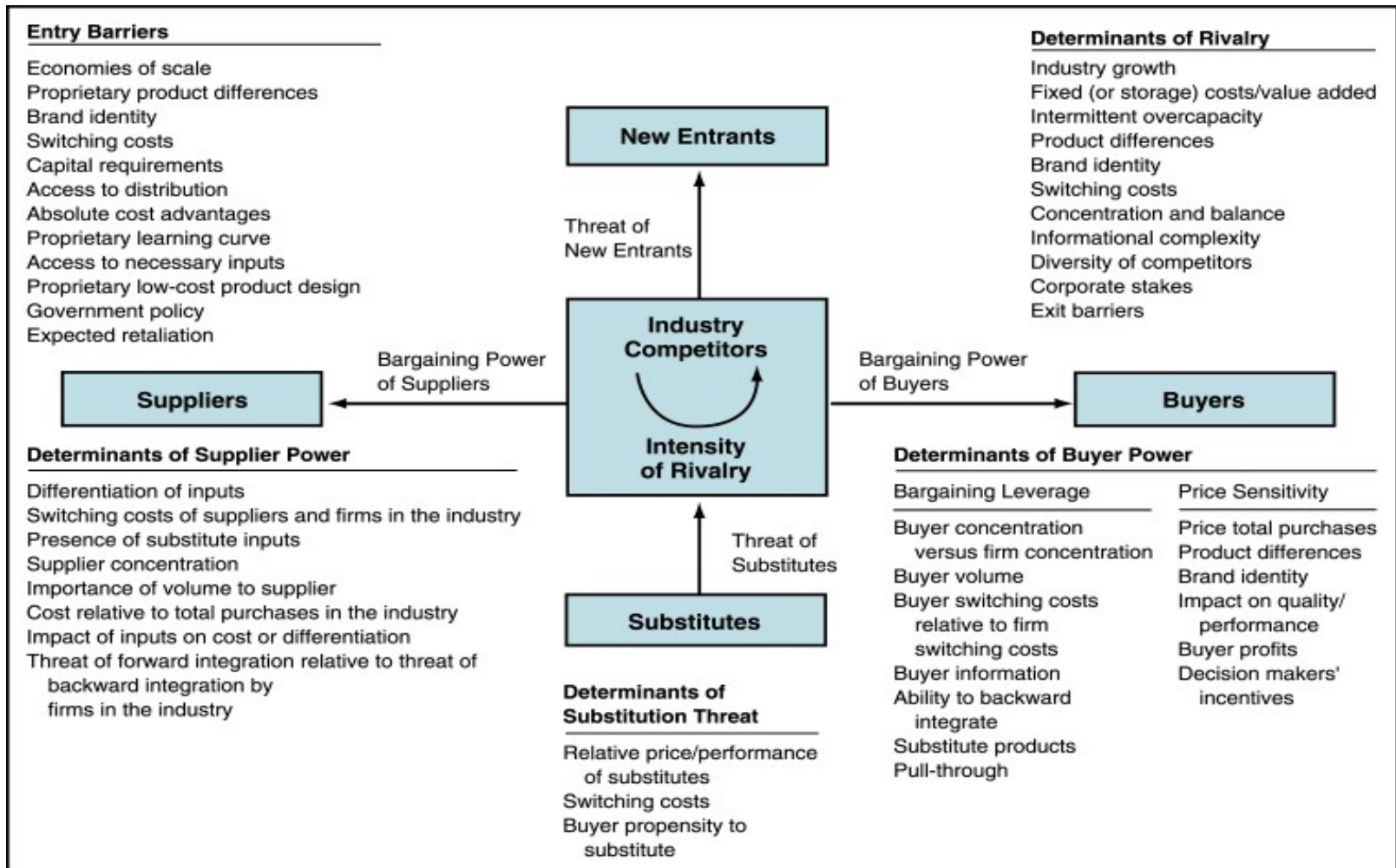
- ...can respond properly and in a timely manner to changes in the business environment
- Process
  - Recognize changes as quickly as they occur, or before
  - Deal with changes properly and correctly
  - Become a digital and agile enterprise
  - Do not wait for competitor to introduce change
  - Change your information systems quickly

# Competitive Situation



- Competitive Forces Model by Porter
  - A business framework, devised by Michael Porter, for analyzing competitiveness by looking at five major forces that might alter a firm's competitive standing.

# Competitive Situation



# Competitive Advantage

- Competitive Advantage
  - An advantage over competitors in some measure such as cost, quality, or speed, which leads to control of a market and to larger- than average profits.
- Strategies
  - Cost Leadership, Differentiation, Customer-orientation, New Markets, Innovation, Operational Effectiveness, Lock-in & Switching Costs

# Discussion

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- Which of these strategies can be enhanced by the use of IS/IT, and how?



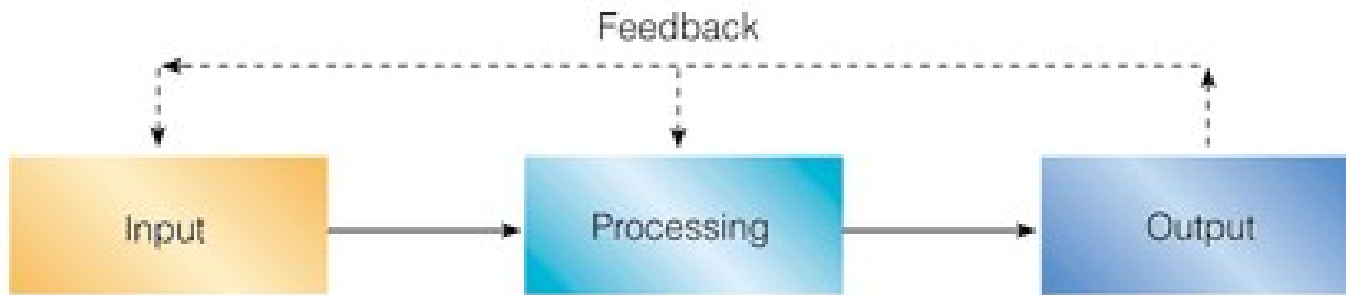
# Activity



- Look through the list of contestants for TechCrunch Disrupt SF 2015 and NY 2015
  - <http://techcrunch.com/startup-battlefield/disrupt-sf-2015/>
  - <http://techcrunch.com/startup-battlefield/disrupt-ny-2015/>
- Pick a large Turkish company (e.g. Turkcell) and decide on which contestant they should be, and the reason for it, as well as how the use will look like.

# What is an Information System?

- A set of interrelated components that collect, manipulate, store, and disseminate data and information and provide feedback to meet an objective.



\*\*\*This process could be manual or computerized (CBIS – Computer Based IS).

# Components of a CBIS

- **Hardware** - computer equipment used to perform input, processing, and output activities.
- **Software** - computer programs that govern the operation of the computer.
- **Database** - an organized collection of facts and information, typically consisting of two or more related data files.
- **Telecommunications** - the electronic transmission of signals for communications which enables organizations to carry out their processes and tasks.
- **People** - the most important element in most computer-based information systems.
- **Procedures** - include the strategies, policies, methods, and rules for using the CBIS.

# Major capabilities of computerized information systems

- Perform high-speed high-volume, numerical computations (DSS)
- Provide fast, accurate, reliable, and inexpensive communication within and between organizations, anytime, anyplace.
- Store huge amounts of information in an easy to access, yet small space (database management)
- Allow quick and inexpensive access to vast amounts of information worldwide at any time
- Enable collaboration any where anytime.
- Increase the effectiveness and efficiency of people working in groups in one place or in several locations (ex. data exchange, video conferencing)
- Vividly present information
- Facilitate global trade (ex. [thaigem.com](http://thaigem.com))
- Enable automation of routing decision making.
- Can be wireless, thus supporting unique applications

# Information Concepts



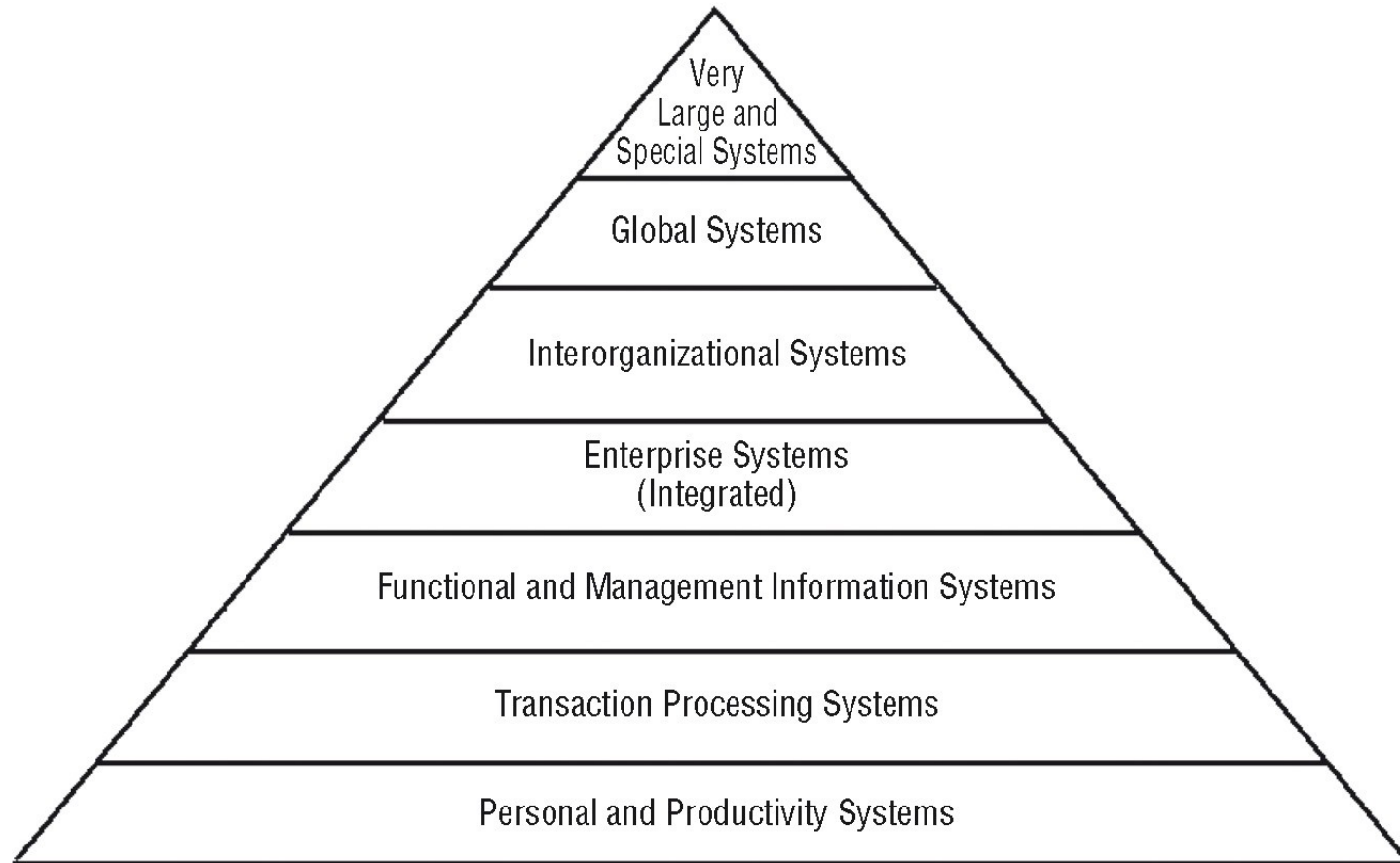
- **Data items:** An elementary description of things, events, activities, and transactions that are recorded, classified, and stored, but are not organized to convey any specific meaning.
- **Information:** Data that have been organized so that they have meaning and value to the recipient.
- **Knowledge:** 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.

# Discussion



- Think about the differences between data, information and knowledge for one of the following examples:
  - Student grades
  - Stock prices

# Information System - Classification By Support Function



# Transaction Processing System (TPS)

- TPS automates routine and repetitive tasks that are critical to the operation of the organization, such as preparing a payroll, billing customers, Point-of-Sale, and Warehouse operations
- Data collected from this operation supports the MIS and DSS systems employed by Middle Management
- Primary purpose to perform transactions and collect data



# Management Information Systems (MIS)

- These systems access, organize, summarize, and display information for supporting *routine decision making* in the functional areas. Geared toward middle managers, MIS are characterized mainly by their ability to produce periodic reports such as a daily list of employees and the hours they work, or a monthly report of expenses as compared to a budget
- Primary purpose to process data into information

# Decision Support Systems (DSS)

- These systems support complex non-routine decisions
- Primary purpose to process data into information
- DSS systems are typically employed by tactical level management whose decisions and what-if analyses are less structured
- This information system not only presents the results but also expands the information with alternatives
- Some DSS methodologies
  - Mathematical Modeling (MIP)
  - Simulation (What-If)
  - Queries
  - Data mining (Bank, Texas Tax Department)
  - Forecasting (Nike vs Benetton)

# ERP Systems



- Focus on processes throughout the enterprise (functional information systems focus on one area/department only)
  - Accounting
  - Human Resource
  - Production
  - Sales / Distribution
  - Logistics
- Integration of all tasks (single database, uniform GUI)
- Examples: SAP, Oracle, Navision,...

# Expand the Scope to Include External Environments

The flow of materials, information, money, and services from raw material suppliers through factories and warehouses to the end customers is a **supply chain.**

## Components of the Supply Chain

- **Upstream supply chain**
  - includes the organizations first-tier suppliers and their suppliers (**information sharing, VMI, E-procurement**)
- **Internal supply chain**
  - includes all the processes used by an organization in transforming the inputs of the suppliers to outputs (**ERP, DSS, etc**)
- **Downstream supply chain**
  - includes all the processes involved in **delivering the products** to final customers (**extranet, cross-docking**)

# Inter-Organizational Systems (IOS)

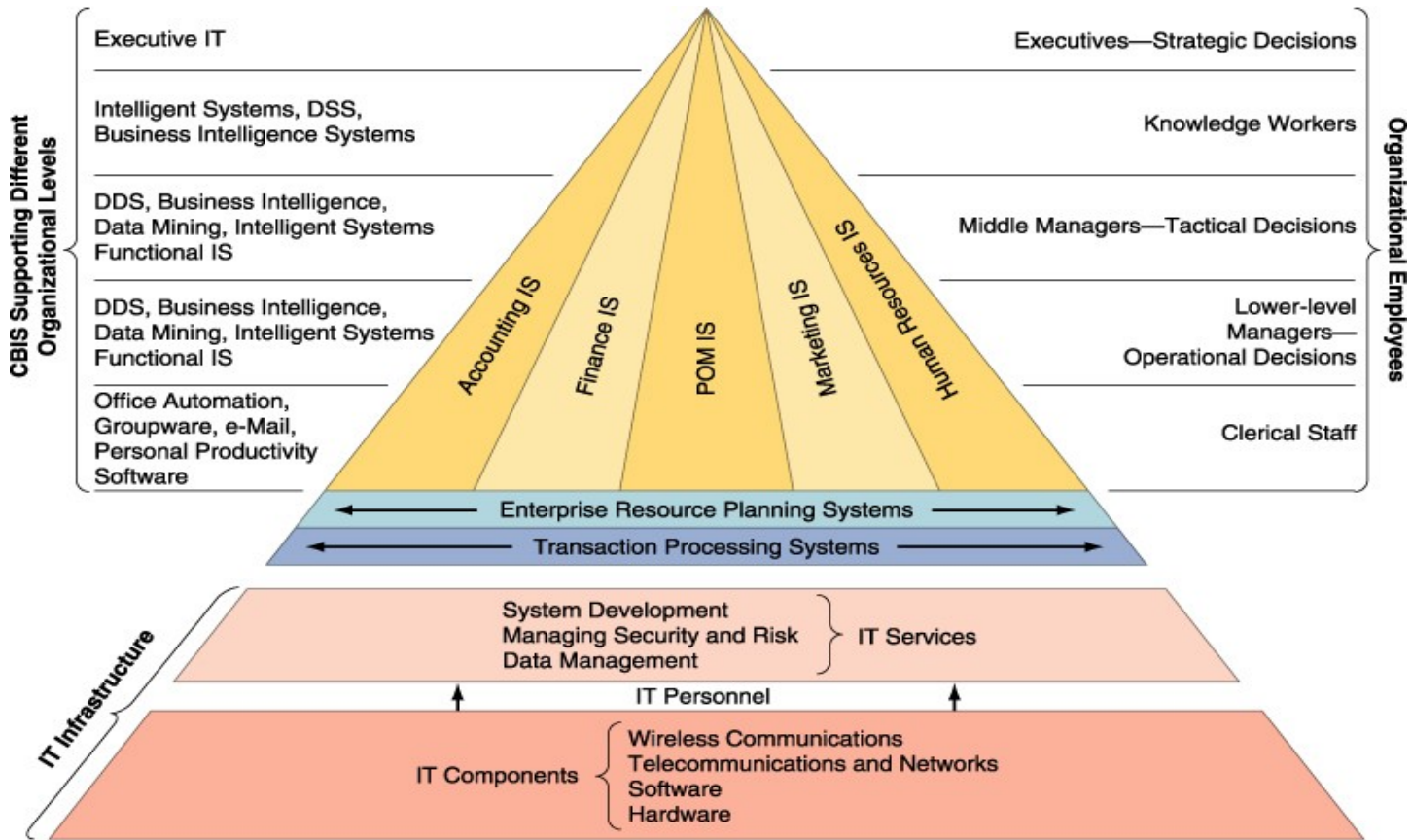
- IOS are systems that connect two or more organizations. These systems are common among business partners and play a major role in e-commerce as well as in **supply chain management support**
- The first type of IT system that was developed in the 1980s to improve communications with business partners was **electronic data interchange (EDI)**, which involved computer-to-computer direct communication of standard business documents (such as purchase orders and order confirmations) between business partners. These systems became the basis for *electronic markets*, which later developed into *electronic commerce*.
- *Web-based systems (many using XML)* deliver business applications via the Internet. Using browsers and the Internet, people in different organizations communicate, collaborate, access vast amounts of information, and run most of the organization's tasks and processes.

# Extranets



- Connect several intranets via the Internet, by adding a security mechanism and some additional functionalities
- Form a larger virtual network that allows remote users (*such as business partners or mobile employees*) to securely connect over the Internet to the enterprise's main intranet
- Extranets are also employed by two or more enterprises (*suppliers & buyers*) to share information in a controlled fashion, and therefore they play a major role in the development of business-to-business electronic commerce and Supply Chain systems (Philip Moris)

# Classification of IS revisited – breadth and level



# Management of Information Resources

- Information resources include hardware, software, data, networks, applications,...
- Management includes acquisition, introduction, support...
- Traditionally, IT/IS department owns all resources
- End-user computing: employees use computers, write applications, manage data etc.
- Leads to fragmented management and need for cooperation between ISD and users
- Who is responsible for which resources
  - Includes financial responsibilities (contracts between users and ISD – IT controlling)



# Discussion



- What are the possible problems associated with:
  - Complete control at ISD, and
  - Complete control for end-users?
- Which factors in a company would lead to which outcome?
- Who should be responsible at Bogazici for choosing which laptops to buy?

# Management of Information Resources

- Chief Information Officer (CIO): sometimes member of top management, nowadays no longer technical, but strategic function
- IT Governance: "... the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives."

# Why Study Information Systems?

- You will be more effective in your chosen career if you understand how successful information systems are built, used, and managed
- You also will be more effective if you know how to recognize and avoid unsuccessful systems and failures
- According to the US Bureau of Labor Statistics, the “top seven fastest growing occupations fall within IT or computer related field”

# Case Study



- Prepare the Minicase Chapter 1 (NHS Hospitals adopt co-operative WiFi) and Case Part I (Building an E-Business at Fedex Corporation) for next class session.