Fundamentals of Information Systems
ICT1161
Lesson - 01

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Today’s Content

- Information system components
  - **Information Concepts**
  - Business Information Systems

What is Data, Information, Knowledge & Process

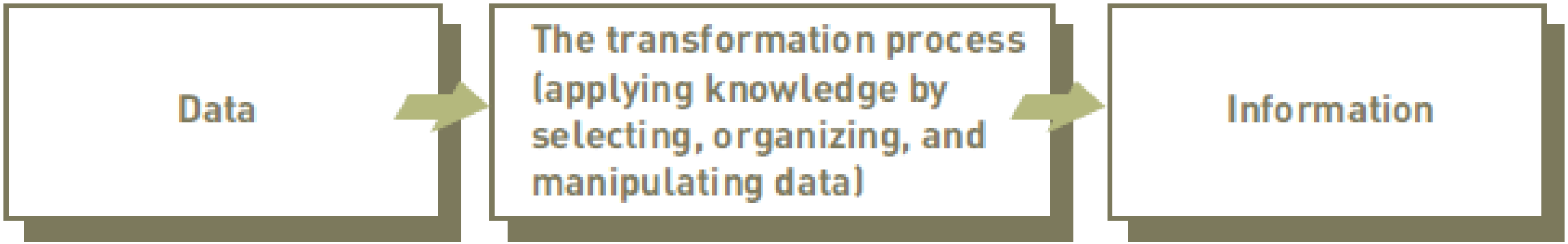
- **Data:** Raw facts
- **Information:** A collection of facts organized in such a way that they have additional value beyond the value of the individual facts
- **Knowledge:** The awareness and understanding of a set of information and ways that information can be made useful to support a specific task or reach a decision

- **Process:** A set of logically related tasks performed to achieve a defined outcome

Data

Data	Represented by
Alphanumeric data	Numbers, letters, and other characters
Image data	Graphic images and pictures
Audio data	Sound, noise, or tones
Video data	Moving images or pictures

The Process of Transforming Data into Information



The Characteristics of Valuable Information

Characteristics	Definitions
Accessible	Information should be easily accessible by authorized users so they can obtain it in the right format and at the right time to meet their needs.
Accurate	Accurate information is error free. In some cases, inaccurate information is generated because inaccurate data is fed into the transformation process. (This is commonly called garbage in, garbage out [GIGO].)
Complete	Complete information contains all the important facts. For example, an investment report that does not include all important costs is not complete.
Economical	Information should also be relatively economical to produce. Decision makers must always balance the value of information with the cost of producing it.
Flexible	Flexible information can be used for a variety of purposes. For example, information on how much inventory is on hand for a particular part can be used by a sales representative in closing a sale, by a production manager to determine whether more inventory is needed, and by a financial executive to determine the total value the company has invested in inventory.

The Characteristics of Valuable Information

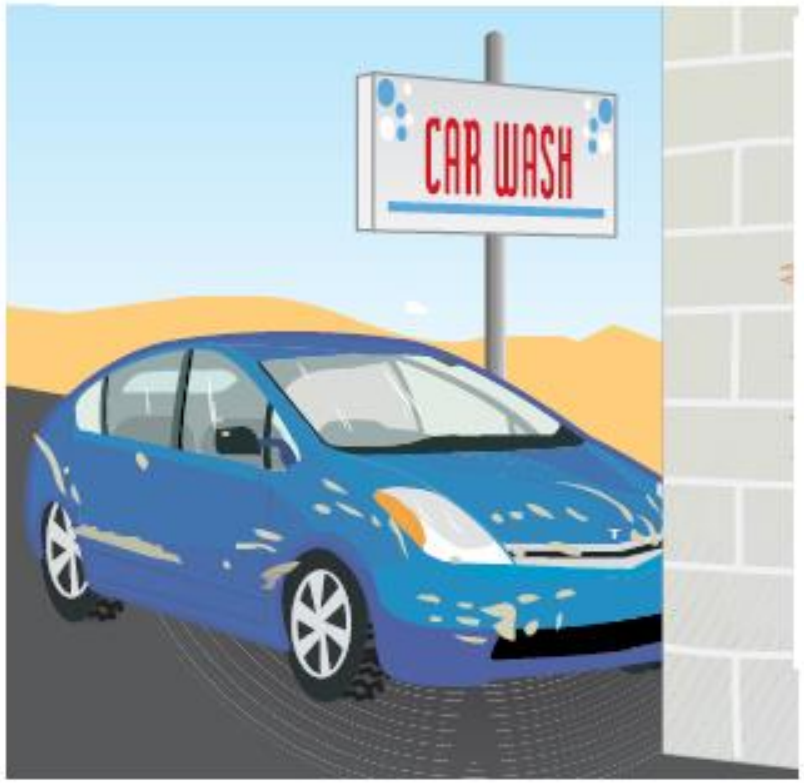
Relevant	Relevant information is important to the decision maker. Information showing that lumber prices might drop might not be relevant to a computer chip manufacturer.
Reliable	Reliable information can be trusted by users. In many cases, the reliability of the information depends on the reliability of the data-collection method. In other instances, reliability depends on the source of the information. A rumor from an unknown source that oil prices might go up might not be reliable.
Secure	Information should be secure from access by unauthorized users.
Simple	Information should be simple, not overly complex. Sophisticated and detailed information might not be needed. In fact, too much information can cause information overload, whereby a decision maker has too much information and is unable to determine what is really important.
Timely	Timely information is delivered when it is needed. Knowing last week's weather conditions will not help when trying to decide what coat to wear today.
Verifiable	Information should be verifiable. This means that you can check it to make sure it is correct, perhaps by checking many sources for the same information.

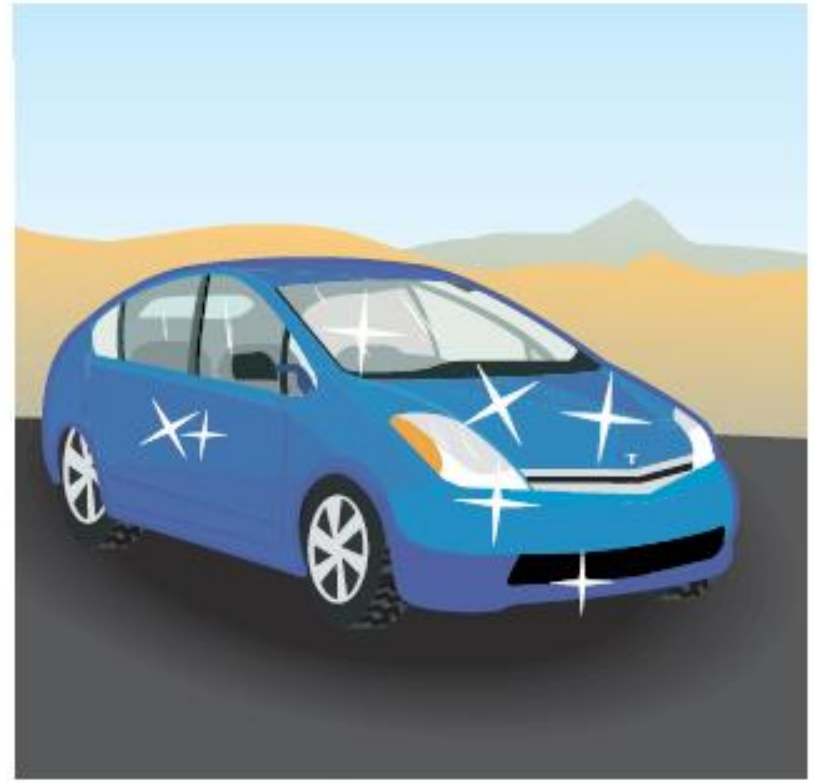
What is a System?

- A set of interrelated components that work together to meet an objective.
- A set of elements or components that interact to accomplish goals.

Components of a System

- A system’s four components consist of
  - Input
  - Processing
  - Output
  - Feedback (Optional)





Input → Processing → Output

Feedback

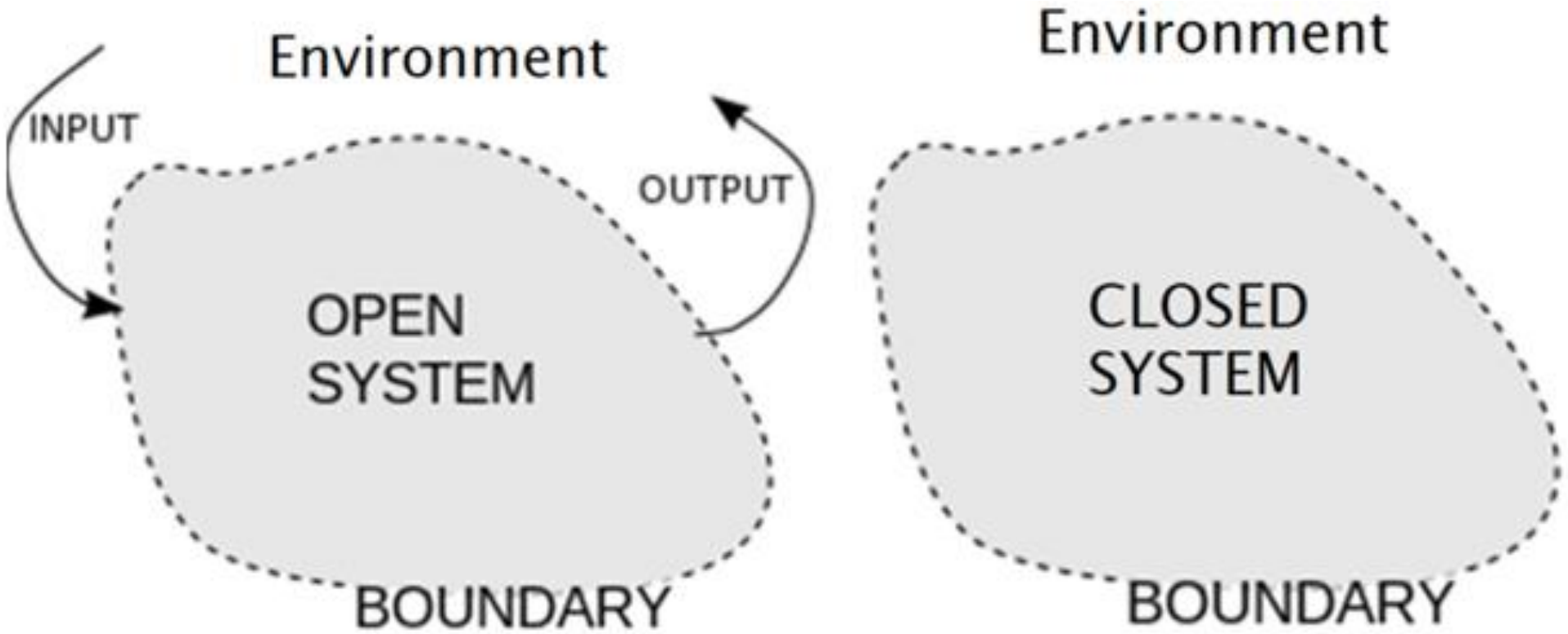
Now your turn:

Respiratory system

A computer game : Candy crush

System categories:

- Open
- Close



System categories:

- Open
- Close

A closed system is a system that is completely isolated from its environment.

An open system is a system that has flows of information, energy, and/or matter between the system and its environment, and which adapts to the exchange.

- Examples ???

Open System : human body. It requires the inputs of food and oxygen to continue to function, and it outputs carbon dioxide and other waste, which must be handled by other systems

Closed System: Earth, as a whole, can be considered a closed system, as nothing generally enters or leaves it except the energy from the sun.

What is an Information System?

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

Input, Processing, Output, Feedback

(The Components of an Information System)

- **Input:** The activity of gathering and capturing raw data
- **Processing:** means converting or transforming data into useful outputs
- **Output:** involves producing useful information, usually in the form of documents and reports
- **Feedback**: Information from the system that is used to make changes to input or processing activities
- *FORCASTING : Predicting future events to avoid problems.*

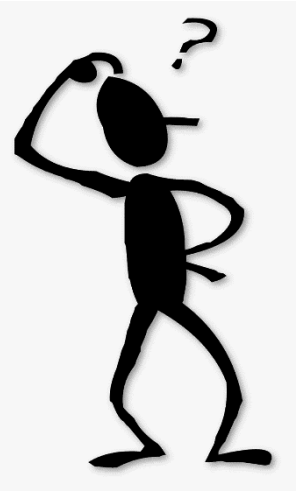
Examples for IS:

- From audience please!

Information System categories:

- We know about :
  - Open
  - Close

- SIDE WORK: What are the other Information System categories ???



Manual IS

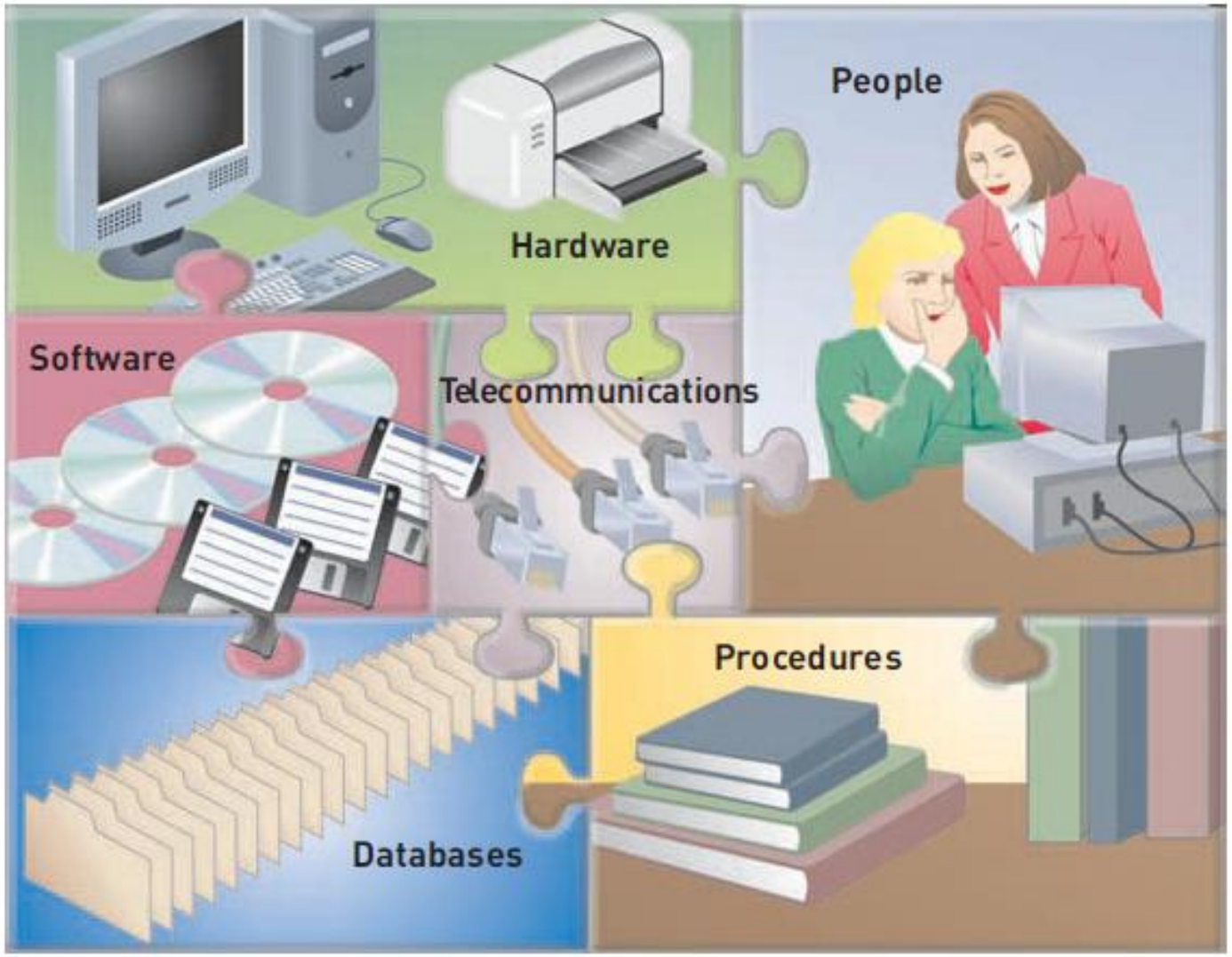
- Entire process is done via manual way.

- Ex: Old libraries …?

Computer Based IS (CBIS)

- CBIS is a single set of hardware, software, databases, telecommunications, people, and procedures that are configured to collect, manipulate, store, and process data into information.
- IS that is processed via computer systems…

Component of CBIS



Component of CBIS

- **Hardware:** Computer equipment used to perform input, processing, and output activities
- **Software:** The computer programs that govern the operation of the computer
- **Database:** An organized collection of facts and information
- **Telecommunications:** The electronic transmission of signals for communications, which enables organizations to carry out their processes and tasks through effective computer networks

Component of CBIS

- **Networks:** Computers and equipment that are connected in a building, around the country, or around the world to enable electronic communications
- **Internet:** The world's largest computer network, consisting of thousands of interconnected networks, all freely exchanging information
- **People**
- **Procedures**: Include the strategies, policies, methods, and rules for using the CBIS, including the operation, maintenance, and security of the computer
  - Ex: Who can access what data

Discussion:
LMS (Learning Management System)

Component	Example
Hardware	
Software	
Databases	
Telecommunications	
People	
Procedures	

Global challenges in IS

- Cultural challenges
- Language challenges
- Time and distance challenges
- Infrastructure challenges
- Currency challenges
- Product and service challenges
- Technology transfer issues
- State, regional, and national laws

Cultural challenges. Countries and regional areas have their own cultures and customs that can significantly affect individuals and organizations involved in global trade.

Language challenges. Language differences can make it difficult to translate exact meanings from one language to another.

Time and distance challenges. Time and distance issues can be difficult to overcome for individuals and organizations involved with global trade in remote locations. Large time differences make it difficult to talk to people on the other side of the world. With long distance, it can take days to get a product, a critical part, or a piece of equipment from one location to another location.

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Infrastructure challenges. High-quality electricity and water might not be available in certain parts of the world. Telephone services, Internet connections, and skilled employees might be expensive or not readily available.

Currency challenges. The value of different currencies can vary significantly over time, making international trade more difficult and complex.

Product and service challenges. Traditional products that are physical or tangible, such as an automobile or bicycle, can be difficult to deliver to the global market. However, electronic products (e-products) and electronic services (e-services) can be delivered to customers electronically, over the phone, through networks, through the Internet, or by other electronic means. Software, music, books, manuals, and advice can all be delivered globally and over the Internet.

Technology transfer issues. Most governments don’t allow certain military-related equipment and systems to be sold to some countries. Even so, some believe that foreign companies are stealing intellectual property, trade secrets, and copyrighted materials, and counter feiting products and services.

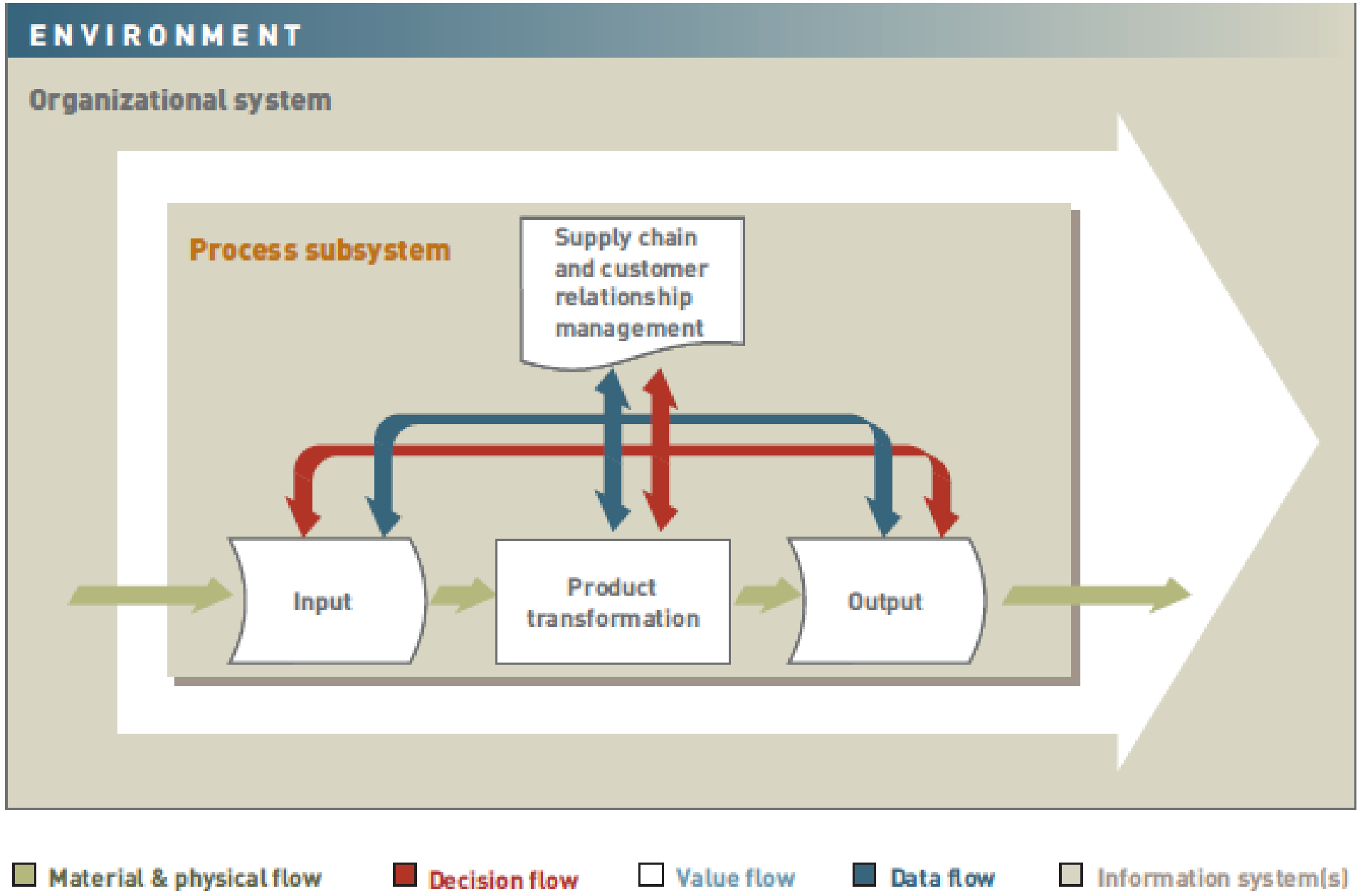
State, regional, and national laws. Each state, region, and country has a set of laws that must be obeyed by citizens and organizations operating in the country. These laws can deal with a variety of issues, including trade secrets, patents, copyrights, protection of personal or financial data, privacy, and much more. Laws restricting how data enters or exits a country are often called transborder data-flow laws. Keeping track of these laws and incorporating them into the procedures and computer systems of multinational and transnational organizations can be very difficult and time consuming, requiring expert legal advice.

Globalization Eras

Era	Dates	Characterized by
Globalization 1.0	Late 1400–1800	Countries with the power to explore and influence the world
Globalization 2.0	1800–2000	Multinational corporations that have plants, warehouses, and offices around the world
Globalization 3.0	2000–today	Individuals from around the world who can compete and influence other people, corporations, and countries by using the Internet and powerful technology tools

Organization

- A formal collection of people and other resources established to accomplish a set of goals
- Types: For-profit , Non-profit
- An organization is a system, which means that it has inputs, processing mechanisms, outputs, and feedback


ENVIRONMENT
Organizational system
Process subsystem
Supply chain and customer relationship management
Input
Product transformation
Output
Material & physical flow
Decision flow
Value flow
Data flow
Information system(s)

Information systems support and work within all parts of an organizational process. Input to the process subsystem can come from internal and external sources. Just prior to entering the subsystem, data is external. After it enters the subsystem, it becomes internal. Likewise , goods and services can be output to either internal or external systems.

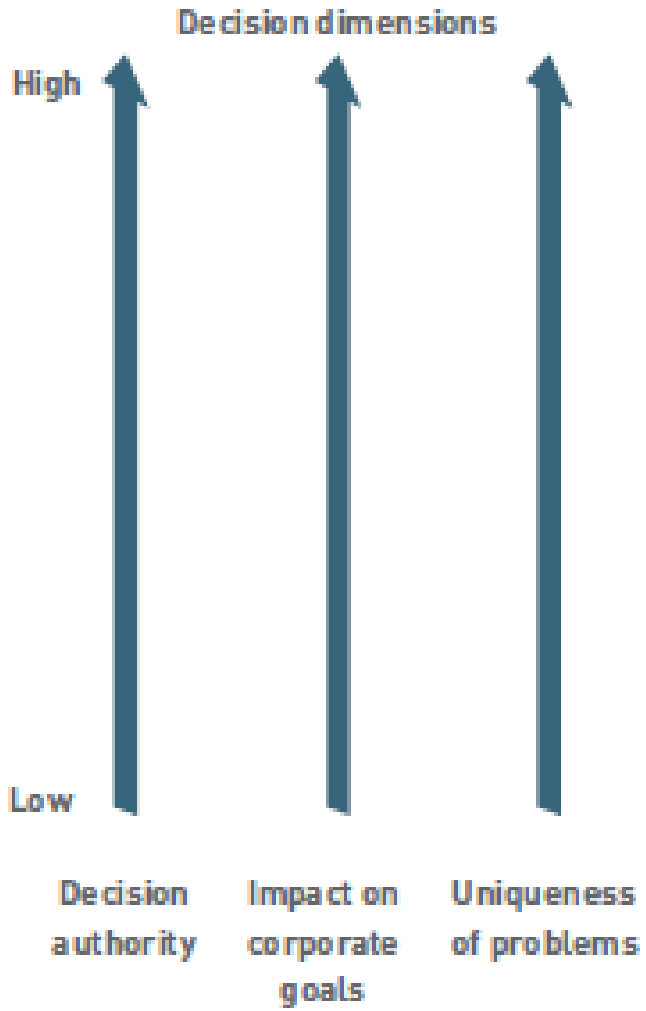
Organizational Structures

- Organizational subunits and the way they relate to the overall organization
- An organization’s structure depends on its goals and approach to management, and can affect how it views and uses information systems
- Types: Traditional, project, team, and virtual

Traditional Organizational Structure

- Called a hierarchical structure
- Managerial pyramid where the hierarchy of decision making and authority flows from the strategic management at the top down to operational management and non-management employees
- So many levels

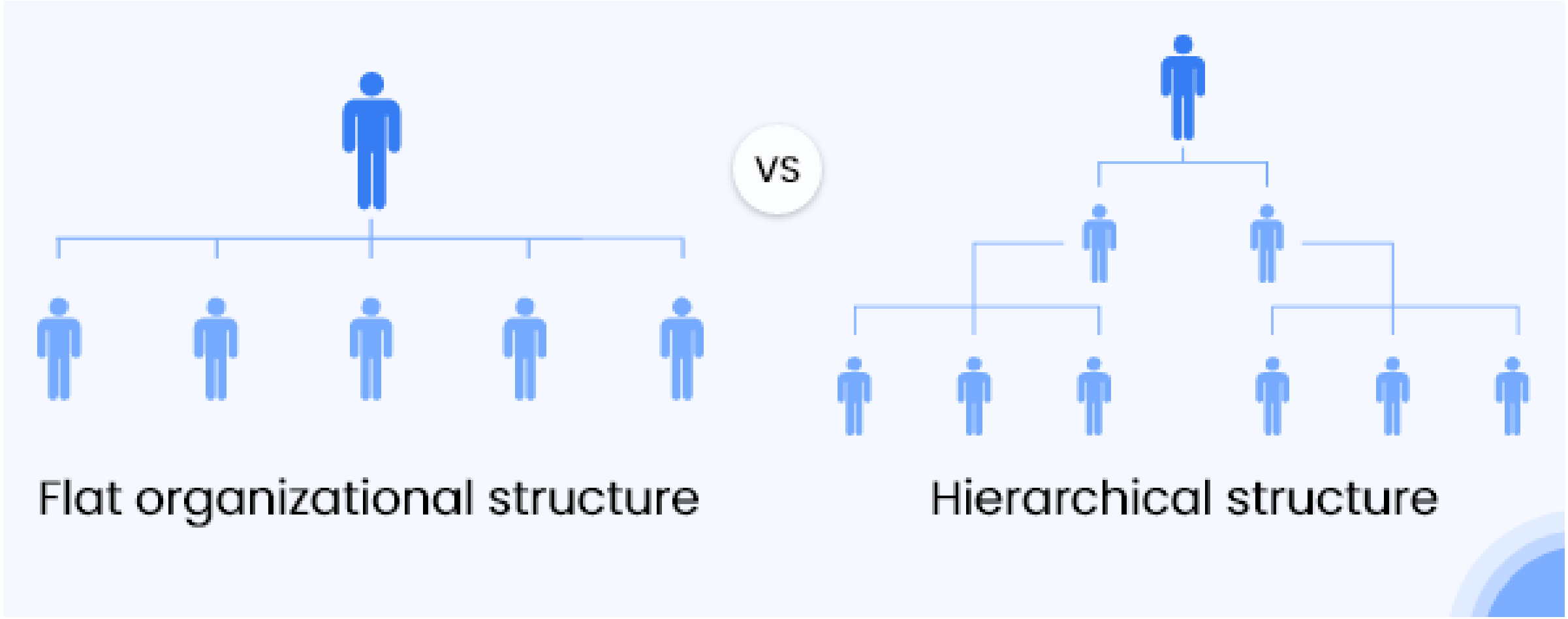
Compared to lower levels, the strategic level, including the president of the company andvice presidents, has a higher degree of decision authority, more impact on corporate goals,and more unique problems to solve



Flat organizational structure

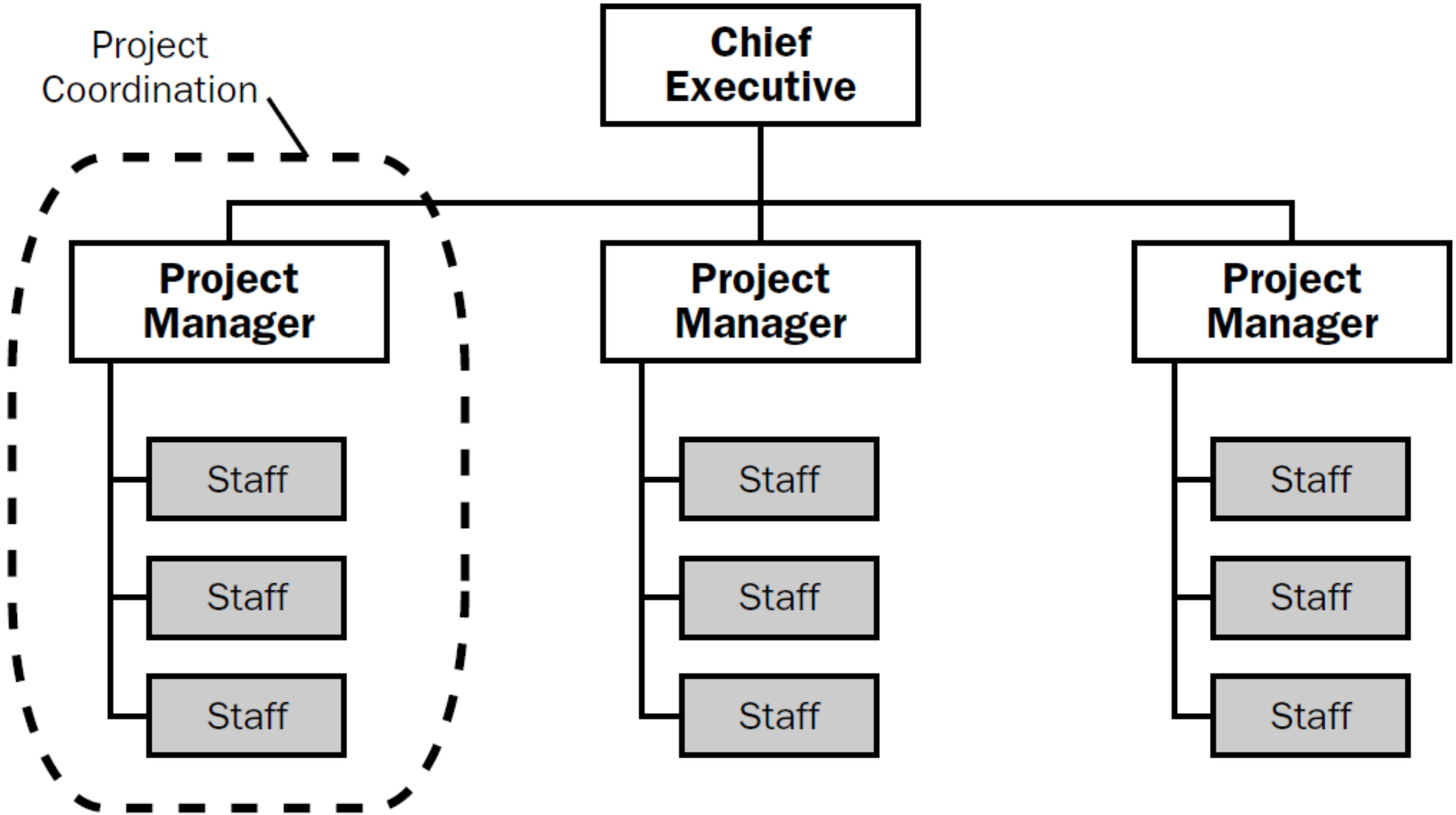
- An organizational structure with a reduced number of management layers

Hierarchical vs. Flat



Project Organizational Structures

- Centered on major products or services


Project
Coordination
Chief
Executive
Project
Manager
Project
Manager
Project
Manager
Staff
Staff
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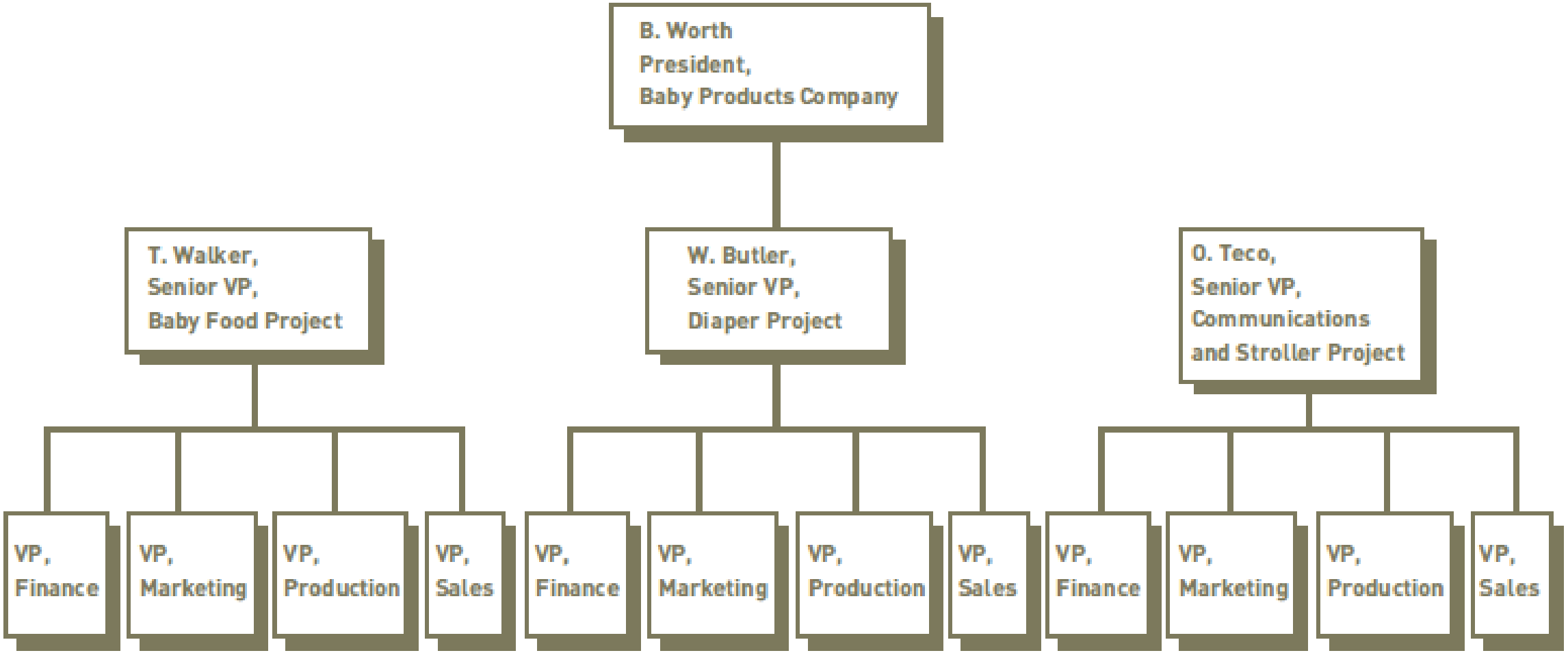
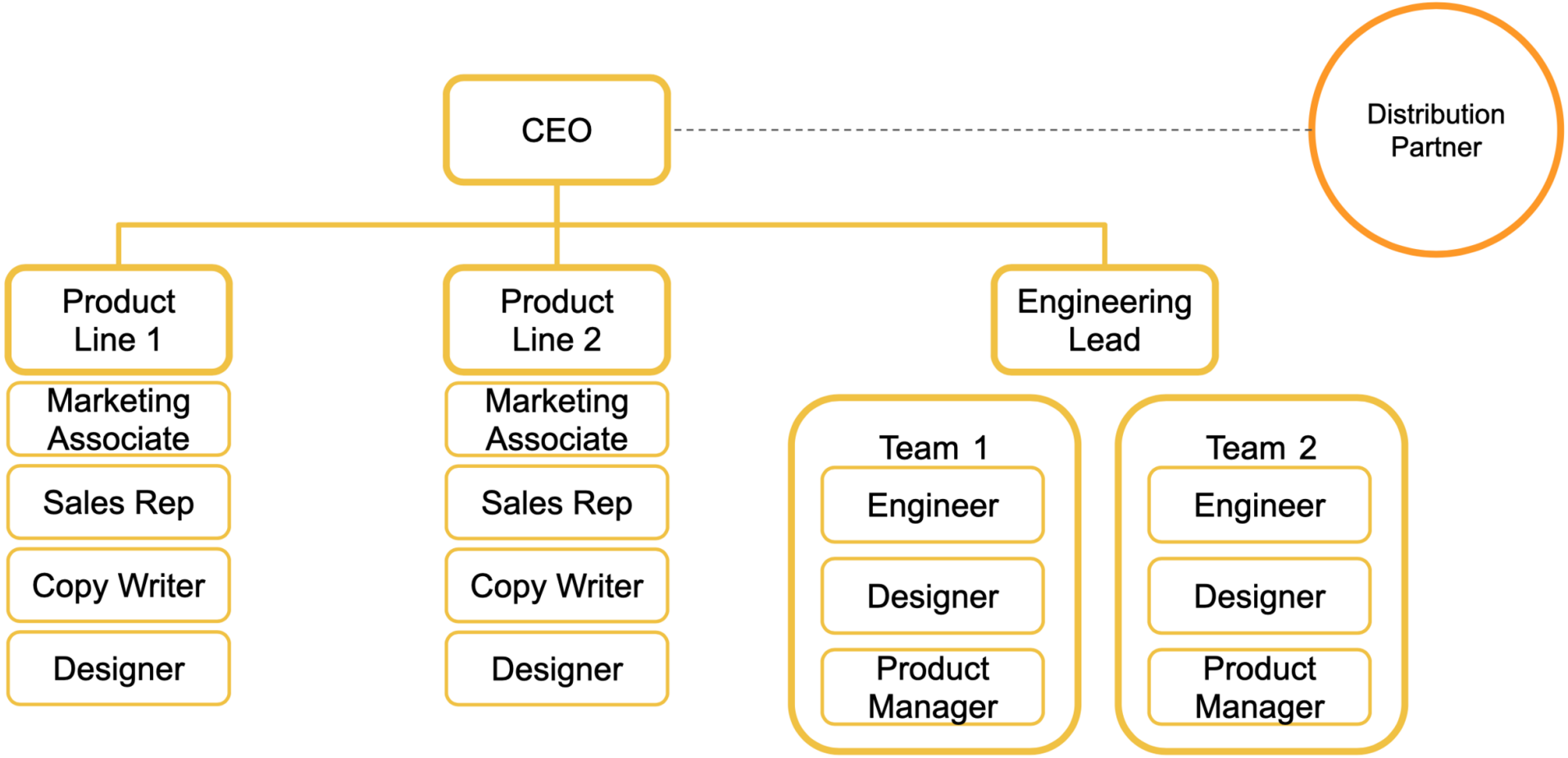
Staff

Ex: Baby products



Team Organizational Structures

- Centered on work teams or groups



Virtual Organizational Structure and Collaborative Work

- Employs individuals, groups, or complete business units in geographically dispersed areas that can last for a few weeks or years, often requiring telecommunications or the Internet
- Ex: WFH

Task 01:

- Groups of 5, indicate the student names & registration numbers
- Submit on or before 16th February 2025 @ 11.59 pm
- Find 5 different Information Systems (2 manual, 3 Computer based)
- Fill the given table for each selected Information System as a word document

Item	Description
Name of the IS	
Objective of the IS	
Used data/information of the IS	
Processes of the IS	
Advantages of using the IS	
Outcome of the IS	

Recommended Books

- “Principles of Information Systems” by “Ralph Stair, George Reynolds”

  Publisher: Course Technology, Cengage Learning 2010 year ISBN: 0324665288

- “M: Information Systems, 4th edition” by “Paige Batlzan”

  Publisher: McGraw-Hill Higher Education 2017 year

  ISBN: 9781259814297

Thank You!