# Introduction to BIS

## Managerial Issues

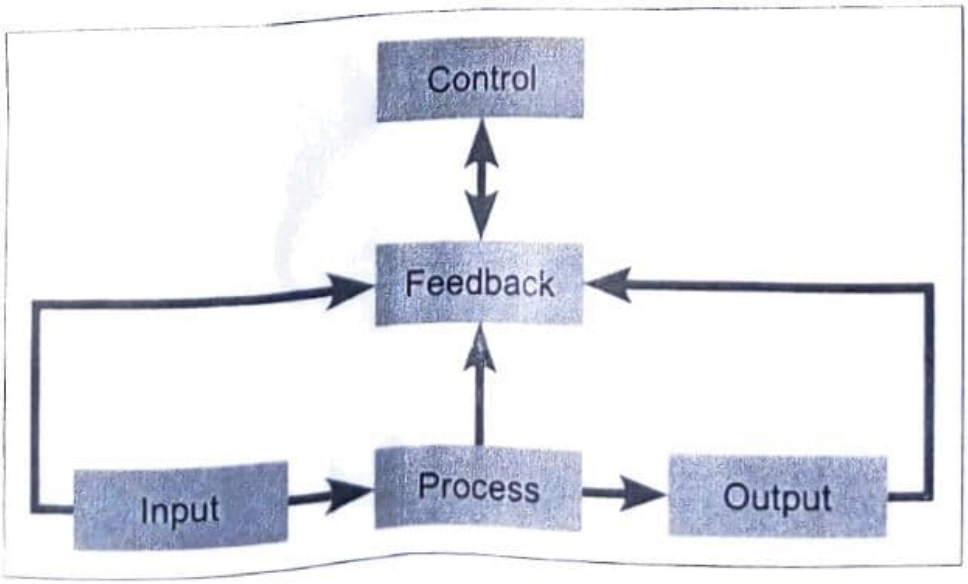
- From a managerial perspective, this lecture addresses the following areas:
  - How systems theory is used as a means of defining problems and situations so that they can be understood more easily and BIS can be developed to support them.
  - How managers can maximize an organization's use of technology by understanding BIS.
  - How BIS can help achieve competitive advantage.

# Systems Theory

- **Systems theory** provides a powerful means of analyzing and improving business processes. It can be applied to a wide variety of different areas and is fundamental to gaining a good understanding of the managerial application of BIS.

- A **system** can be defined as a collection of interrelated components that work together towards a collective goal. The function of a system is to receive inputs and transform these into outputs.

# A basic transformation process and generic system model



# System Characteristics

- *The components of a system work towards a collective goal.*
  - This is known as the system's **objective**. The objective of a system is normally very specific and can often be expressed in a single sentence.
  - Eg, the objective of a car might be expressed simply as follows: to transport people and goods to a specified location.
- **System objective**: All components of a system should be related to one another by a common objective.

# System Characteristics

- *Systems do not operate in complete isolation*. They are contained within an **environment** that contains other systems and external agencies.
- The scope of a system is defined by its **boundary**. Everything outside of the boundary is part of the system's environment, everything within the boundary forms part of the system itself.
- The boundary also marks the **interface** between a system and its environment. The interface describes exchanges between a system and the environment, or other systems.
- **Environment**: The surroundings of a system, beyond its boundary.
- **Boundary**: The interface between a system and its environment.
- **Interface**: Defines exchanges between a system and its environment, or other systems.

# System Characteristics

- *Systems can be complex and can be made up of other smaller systems*. These are known as **subsystems**.
- Systems composed of one or more subsystems are sometimes referred to as **suprasystems**.
- The objective of a subsystem is to support the larger objective of the suprasystem.
- For an organisation, the subsystems such as marketing and finance would lie within the system's boundary, while the following elements would lie outside as part of the business environment:
  - Customers, sales channel/distributors, suppliers, competitors, partners, government and legislation, the economy.
- **Subsystem**: Large systems can be composed of one or more smaller systems known as subsystems.
- **Suprasystem**: A larger system made up of one or more smaller systems (*subsystems*).

# System Characteristics

- An organiszation will interact with all these elements that are beyond the system boundary in the environment. We refer to this as an **open system**.
  - ***Most information systems will fall into this category since they will accept input and will react to them***.
- Totally **closed** systems which do not interact with their environment are unusual.
- **Open system**: Interaction occurs with elements beyond the system boundary.
- **Closed system**: No or limited interaction occurs with the environment.

# System Characteristics

- *Subsystems in an information system interact by exchanging information.*
  - This is known as the interface between systems.
- For information systems and business systems, having clearly defined interfaces is important to an efficient organization.
  - For example, sales orders must be passed from the sales subsystem to the finance subsystem and the distribution subsystem in a clear, repeatable way.
  - If this does not happen, orders may be lost or delayed and customer service will be affected.

# System Characteristics

- Systems are made up of subsystems that may themselves be made up of other subsystems.
- From this, one should realise that the parts of a system are dependent on one another in some way. This **interdependence** means that a change to one part of a system leads to or results from changes to one or more other parts.
- **Interdependence**: Interdependence means that a change to one part of a system leads to or results from changes to one or more other parts.

# Defining Business Information Systems (BIS)

- *A business information system is a group of interrelated components that work collectively to carry out input, processing, output, storage and control actions in order to convert data into information products that can be used to support forecasting, planning, control, coordination, decision making and operational activities in an organisation'* **(Bocij, Greasley and Hickie, 2019)**

# Resources that support BIS

1. **People resources**
   People resources include the users of an information system and those who develop, maintain and operate the system.

2. **Hardware resources**
   The term hardware resources refers to all types of machines, not just computer hardware.

3. **Software resources**
   In the same way, the term software resources does not only refer to computer programs and the media on which they are stored, but the term also be used to describe the procedures used by people.

4. **Communications resources**
   Resources are also required to enable different systems to transfer data.

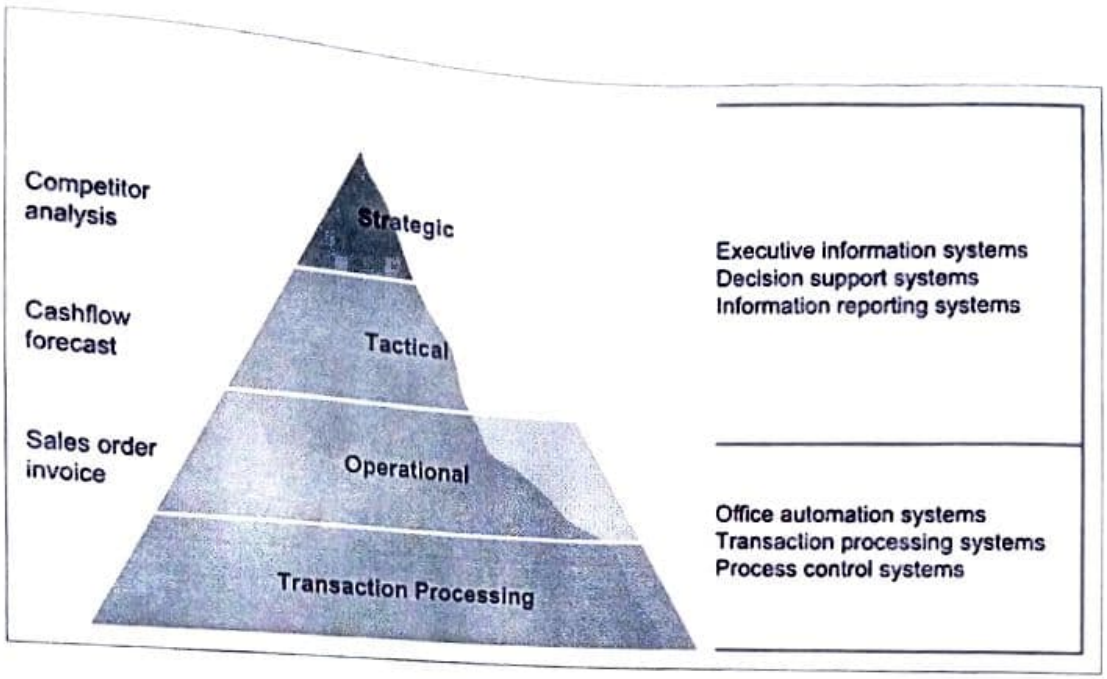
5. **Data resources**
   Data resources describe all of the data that an organization has access to, regardless of its form.

# Merits of Computer based Processing

- **Speed**: Computers can process millions of instructions each second, allowing them to complete a given task in a very short time.
- **Accuracy**: The result of a calculation carried out by a computer is likely to be completely accurate. In addition, errors that a human might make, such as a typing error, can be reduced or eliminated entirely.
- **Reliability**: In many organisations, computer-based information systems operate for 24 hours a day and are only ever halted for repairs or routine maintenance.
- **Programmability**: Although most computer-based information systems are created to fulfil a particular function, the ability to modify the software that controls them provides a high degree of flexibility. Even the simplest personal computer, for example, can be used to create letters, produce cash flow forecasts or manipulate databases.
- **Repetitive tasks**: Computer-based information systems are suited to highly repetitive tasks that might result in boredom or fatigue in people. The use of technology can help to reduce errors and free employees to carry out other tasks.

# Demerits of Computer based Processing

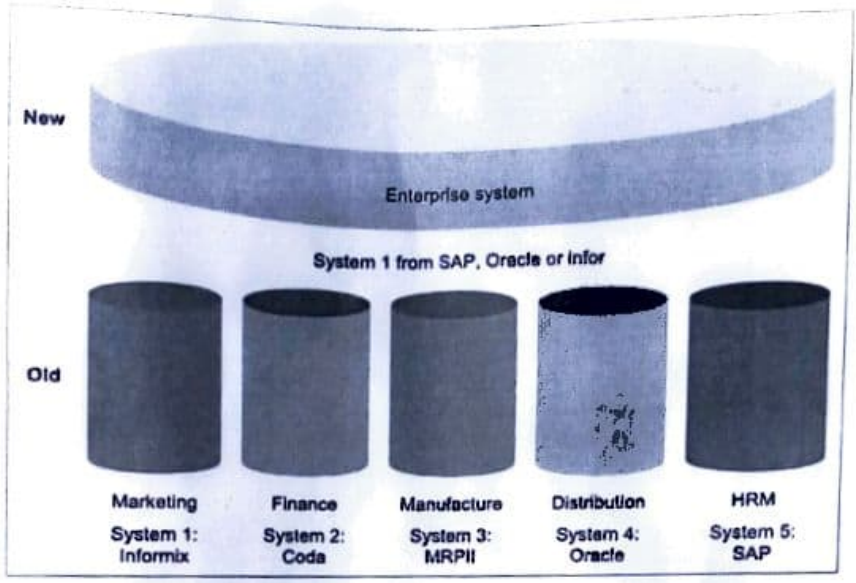
- **Judgement/experience**: Despite advances in artificial intelligence techniques and expert systems, computer-based information systems are considered incapable of solving problems using their own judgement and experience.
- **Improvisation/flexibility**: In general, computer-based information systems are unable to react to unexpected situations and events. Additionally, since most systems are created to fulfill a particular function, it can be difficult to modify them to meet new or changed requirements.
- **Innovation**: Computers lack the creativity of a human being. They are unable to think in the abstract and are therefore restricted in their ability to discover new ways of improving processes or solving problems.
- **Intuition**: Human intuition can play an important part in certain social situations. For example, one might use intuition to gauge the emotional state of a person before deciding whether or not to give them bad news. BIS cannot use intuition in this way and are therefore unsuitable for certain kinds of situations.
- **Qualitative information**: Managers often make unstructured decisions based on the recommendations of others. Their confidence in the person they are dealing with often has a major influence on the decision itself. Once again, BIS cannot act upon qualitative information of this kind.




# Enterprise systems

- Enterprise systems aim to support the business processes of an organization across any functional boundaries that exist within that organization.
  - They use Internet technology to integrate information within the business and with external stakeholders such as customers, suppliers and partners.
- Four main elements of an enterprise system are the following:
  - Enterprise resource planning (ERP) which is concerned with internal production, distribution and financial processes
  - Customer relationship management (CRM) which is concerned with marketing and sales processes
  - Supply chain management (SCM) which is concerned with the flow of materials, information and customers through the supply chain
  - Supplier relationship management (SRM) which is concerned with sourcing, purchasing and the warehousing of goods and services.

# Enterprise system in comparison to separate functional applications




# BIS and strategic advantage

- For different markets, to what extent can BIS support or impact:
  - Cost leadership
  - Product differentiation
  - Innovation
  - Segmentation