

# Management Information System

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Information system for **decision making** in **organization**.

**Integrated System** that provide **operations, decision making** in organization

Management  
Information  
System

Based on **database**  
That provide info for  
people of organization

MIS define in various ways:

“MIS is defined as a system which provides information support for decision making in the organization.”

“MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision making function in the organization.”

“MIS is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.”

# What is System?

A system is an orderly grouping of interdependent components linked together according to a plan to achieve a specific objective.

For example : Computer System, Biological System, Hotel Management System, Business System, College Management System

# The study of system concepts has three basic

- A system must be designed to achieve a predetermined objective.
- Interrelationships and interdependence must exist among the components.
- The objectives of the organization have a higher priority than the objectives of its sub-systems.

# Characteristics of System

## 1. Organization :

- Organization implies structure and order.
- It is the arrangement of components that helps to achieve predetermined objectives.

## 2. Interaction

- Manner in which each component work with other component of system.
- Example: Computer System
  - Keyboard or other input devices work on user input
  - CPU interacts with user input and prompt output with output device.



### 3. Interdependent

- Interdependence means how the components of a system depend on one another. Output of one sub-system is the required input for another sub-system.

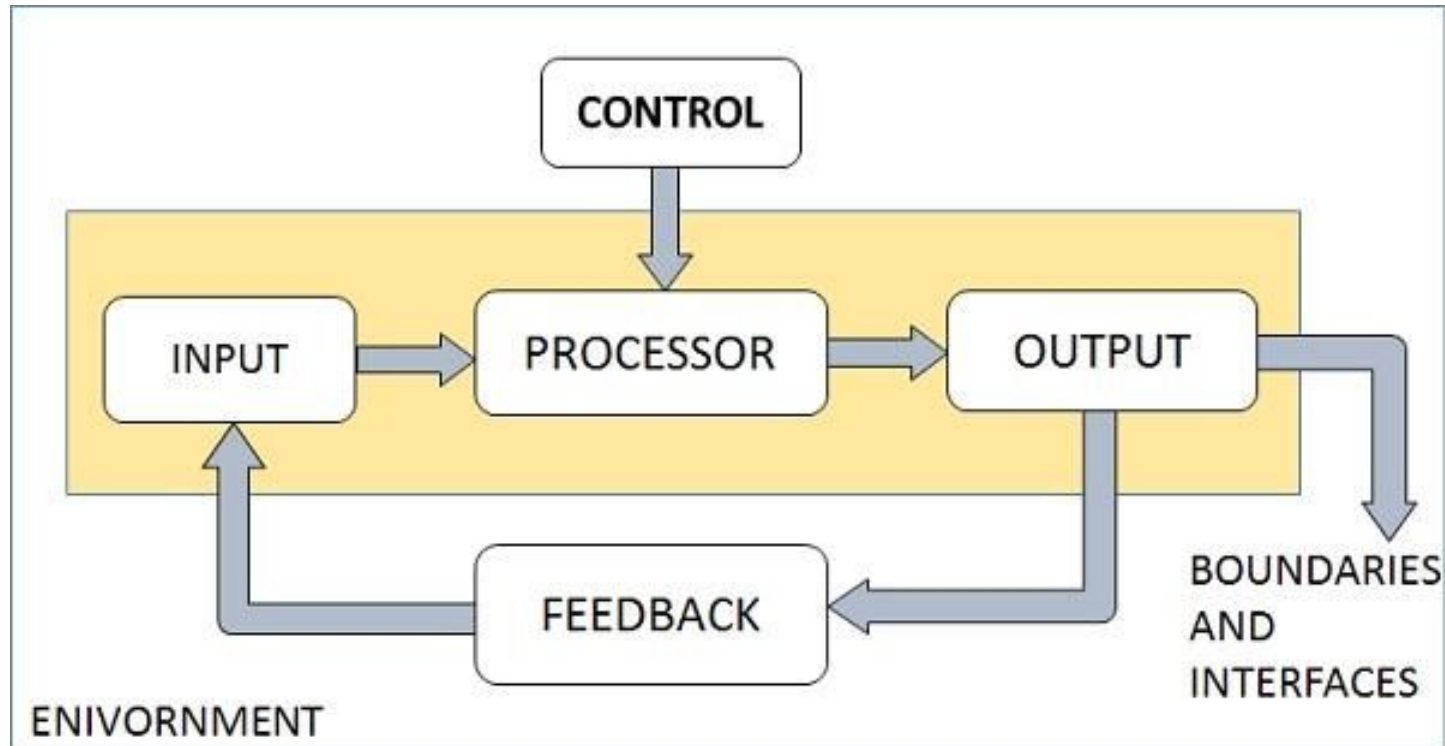
### 4. Central Objective

- The objective of system must be central. It may be real or stated. It is not uncommon for an organization to state an objective and operate to achieve another.

# Elements of a System

1. Input
2. Output
3. Control
4. Environment
5. Boundaries
6. Feedback

# Diagram of System Elements



# Outputs and Inputs:

- The main aim of a system is to produce an output which is useful for its user.
- Inputs are the information that enters into the system for processing.
- Output is the outcome of processing.

# Processors:

The processor is the element of a system that involves the actual transformation of input into output. It is the **operational component** of a system.

Processors may modify the input either **totally** or **partially**, depending on the output specification.

## Control:

The control element guides the system.

It is the **decision-making subsystem** that controls the pattern of activities governing input, processing, and output.

For Example: The behavior of a computer System is controlled by the Operating System and software. In order to keep system in balance, what and how much input is needed is determined by Output Specifications.

# Environment:

The environment is the “supersystem” within which an organization operates.

It is the source of external elements that strike on the system.

It determines how a system must function.

For example, vendors and competitors of organization’s environment, may provide constraints that affect the actual performance of the business.

## Boundaries and Interfaces:

A system should be defined by its boundaries. Boundaries are the limits that identify its components, processes, and interrelationship when it interfaces with another system.



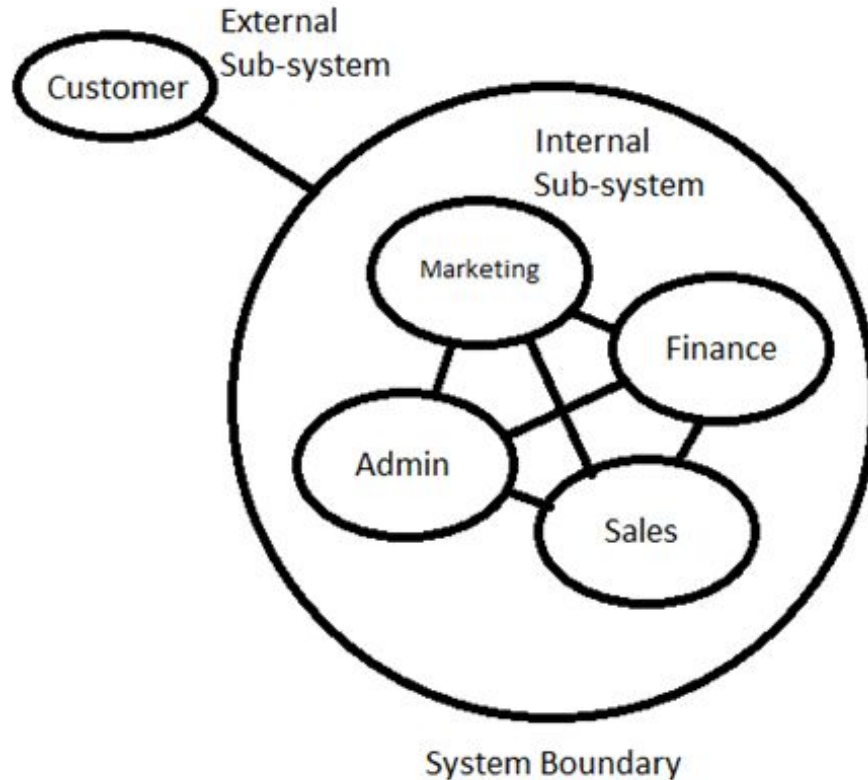
# Feedback:

Feedback provides the control in a dynamic system.

Positive feedback is routine in nature that encourages the performance of the system.

Negative feedback is informational in nature that provides the controller with information for action.

# Example of Business System (Elements)



- **Physical and Abstract**
- **Open and Closed**
- **Sub System and Super System**
- **Permanent and Temporary System**
- **Natural and Man Made System**
- **Deterministic and Probabilistic**
- **Man-made Information System**

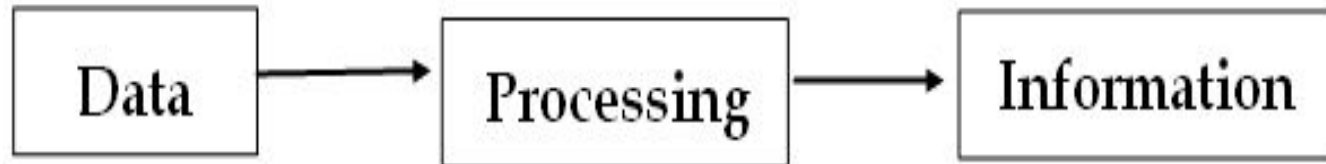
- Physical system is tangible entities that may be static or dynamic in nature.
- Abstract system is conceptual or non-physical. The abstract is conceptualization of physical situations.
- An open system continually interacts with its environment. It receives input from the outside and delivers output to outside.
- A closed system is isolated from environment influences.
- Sub systems are the smaller systems within a system.
- Super system denotes extremely large and complex system.
- A permanent system is a system enduring for a time span that is long relative to the operation of human.
- Temporary system is one having a short time span.
- System which is made by man is called man made system.
- Systems which are in the environment made by nature are called natural system.

- A Deterministic system is one in which the occurrence of all events is perfectly predictable. If we get the description of the system state at a particular time, the next state can be easily predicted.
- Probabilistic system is one in which the occurrence of events cannot be perfectly predicted.
- An man made information system may be defined as a set of devices, procedures and operating system designed around user-base criteria to produce information and communicating it to the user for planning control and performance.

# • Data and Information

According to Davis and Olson -

”Information is a data that has been processed into a form that is meaningful to recipient and is of real or perceived value in the current or the prospective action or decision of recipient.”



**Information Generation**

# Data and Information (cont.)

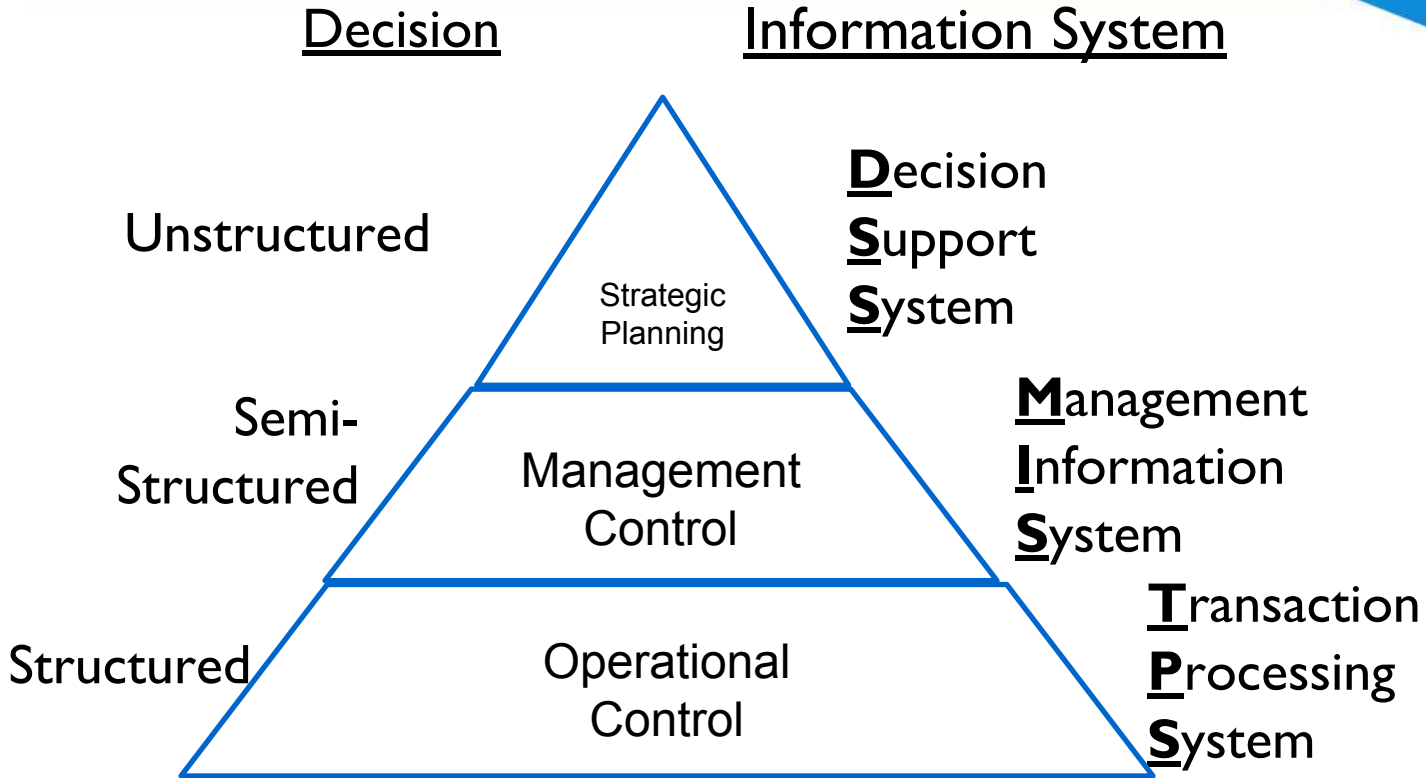
- **Data:** Data is raw facts.
- Data is like raw material. Data does not interrelate and also it does not help in decision making.
- Data is defined as groups of non- random symbols in the form of text, images, voice representing quantities, action and objects.
  
- **Information:** Information is the product of data processing.
- Information is interrelated data.
- Information is equivalent to finished goods produced after processing the raw material.
- The information has a value in decision making. Information brings clarity and creates an intelligent human response in the mind.

# Computer Based Information System

- They can be classified as
  - 3.1** Transaction Processing System (TPS)
  - 3.2** Management Information System (MIS)
  - 3.3** Decision Support System (DSS)
  - 3.4** Office Automation System (OAS)



# The Pyramid Model of Information System



- **Structured Decision**

  - Made on regular basis

  - All three components of decision – data, process and evolution – are determined.

- **Example**

  - Attendance of Students

  - In time and out time of faculty

- Semi-Structured Decision

Having some agreement on the data, process and evaluation to be used, but some level of **human judgment is required**.

- Example

Salary calculation

Student fees

## ● Unstructured Decision

New Decision, New rules to follow.

Based on manager's perception and judgment.

Related to long-term strategy of the organization,

Problems are non routine, critical Problem possesses multiple solution, solution path.

### ● Example

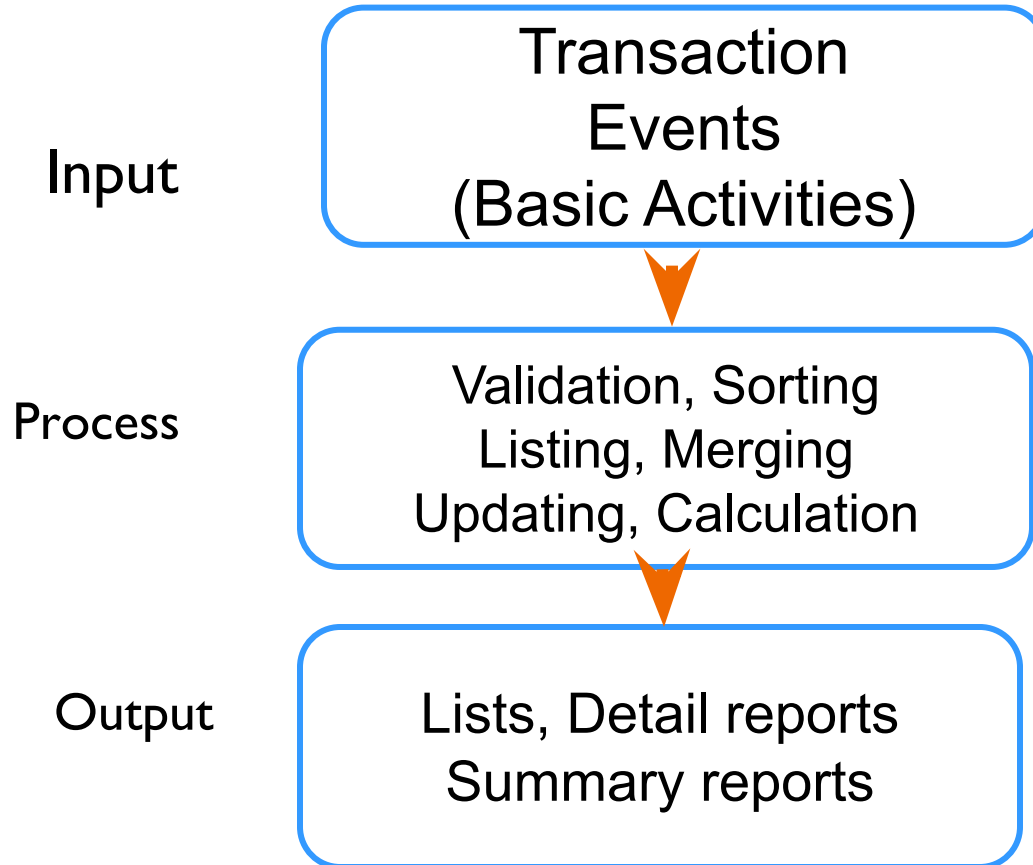
New course start

New syllabus design

# Transaction Processing System

- Transaction Processing System are operational-level systems at the bottom of the pyramid.
  - There is a high volume of transaction
  - Each transaction is similar
  - The techniques of processing the transaction are well understood and can be described in detail.
  - TPS provide speed and accuracy.
- Transaction processing procedures are often called *standard operating procedures.*

# Transaction Processing Systems



## Example of TPS

- Payroll systems (Employee management system)
- Order processing systems
- Reservation systems
- Stock control systems
- Banking System

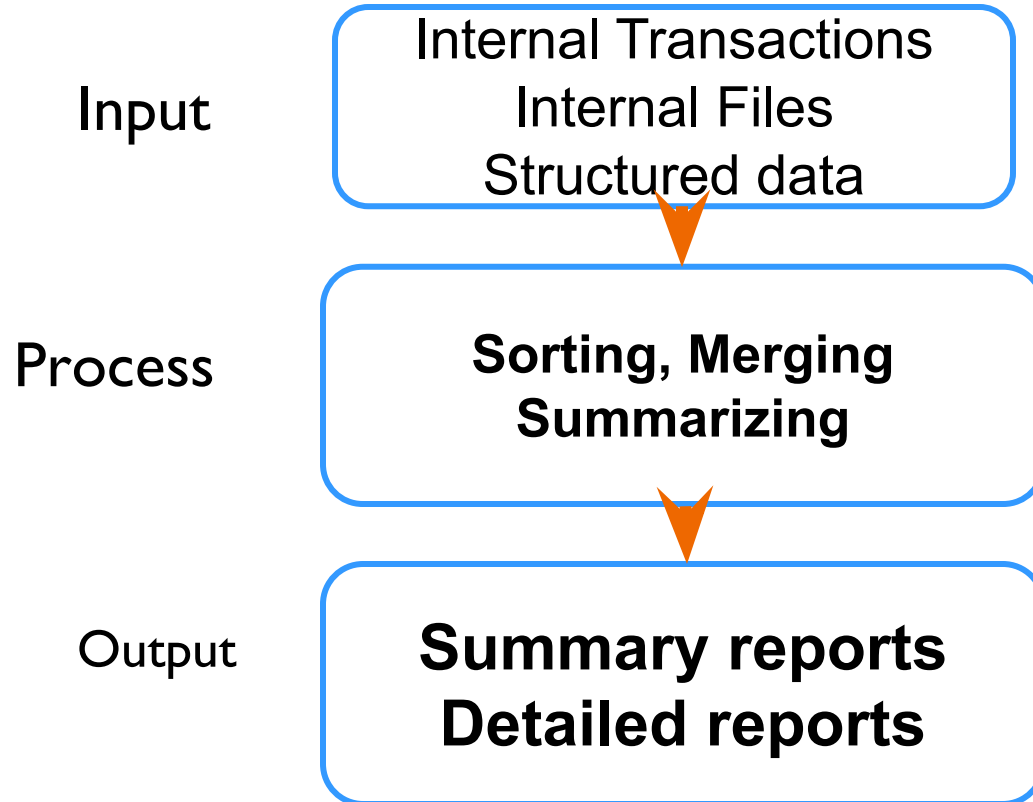
# Management Information System

- MIS are *management-level systems*.
- Used by middle managers to help ensure the smooth running of the organization in the short to medium term.
- System allows managers to evaluate an organization's performance by comparing current output with previous outputs.



# Management Information System

MIS are built on the data provided by the TPS



## Examples of MIS

- Sales management systems
- Budgeting systems
- Management Reporting Systems

- **Some of the decisions that managers have to make are not of recurring nature.**
- **They may occur only once or may occur very infrequently.**
- **They are also unstructured or semi structured decisions.**

# Function of DSS

Depends on MIS & TPS

**Input**

Internal Transactions  
Internal Files  
External Information

**Process**

Modelling,  
Analysis, Summarizing

**Output**

Summary reports  
Graphs / Plots



## Some examples of DSS

- Logistics systems
- Financial Planning systems

# Role of Information in MIS system

# Management Information System

## Role of Information in MIS

- Information is the product of data processing.
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- Information brings clarity and creates an intelligent human response in the mind.

Marketing  
management  
information  
system

Manufacturing  
management  
information  
system

Common  
database

```
graph TD; M[Marketing management information system] <--> C[(Common database)]; F[Financial management information system] <--> C; O[Other management information systems] <--> C; T[TPS] --> C;
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Financial  
management  
information  
system

Other  
management  
information  
systems

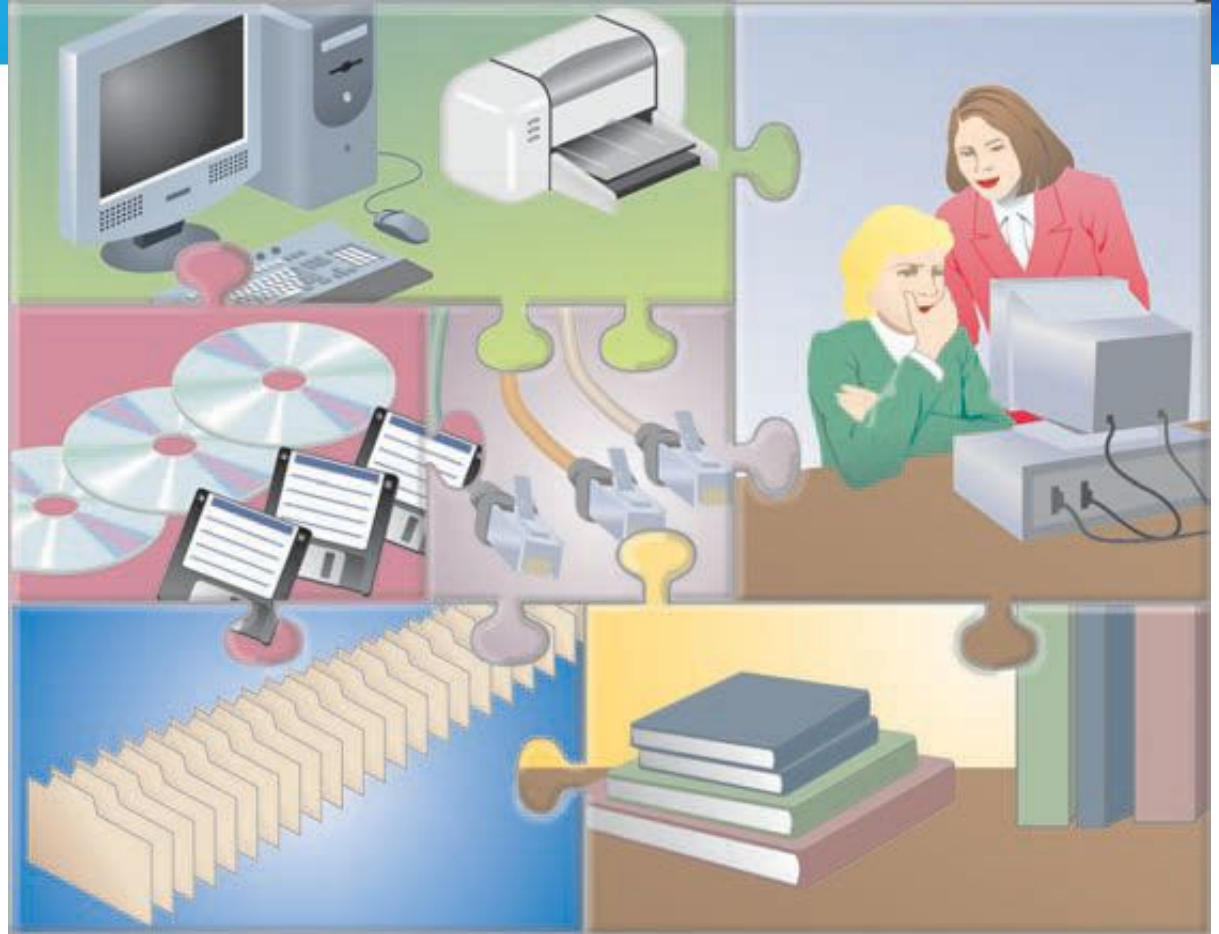
TPS



- **Timeliness :**  
Timeliness means that information must reach the recipients within the prescribed timeframes.
- **Accuracy :** It means that information should be free from mistakes, errors.
- **Relevance :**

- Formal Information System: It is based on organizational chart represented by the organization.
- Informal Information System: it is an employee based system designed to meet personal and vocational needs and to help in the solution of work- related problems.
- Computer Based Information System (CBIS): This category of information system depends mainly on the computer for handling business applications. System analyst develops different types of information systems to meet variety of business needs. There is a class of system collectively known as computer based information system.

# The Components of a Computer-Based Information System.



- The information can be classified in a number of ways provide to better understanding. John Dearden of Harvard University classifies information in

# Action Verses

## No-Action Information:

- The information which induces action is called action Information.
- Example: 'No stock' reports calling a

## Recurring Verses

### No-Recurring Information:

- The information generated at regular intervals is Recurring Information.
- Example:  
The monthly sales reports.

## Internal and external information:

- The information generated through the internal sources of the organization is termed as Internal Information.

# Level of Business Activity in Information System

While developing an information management strategy within an organization, it is useful to consider information need at on three levels :

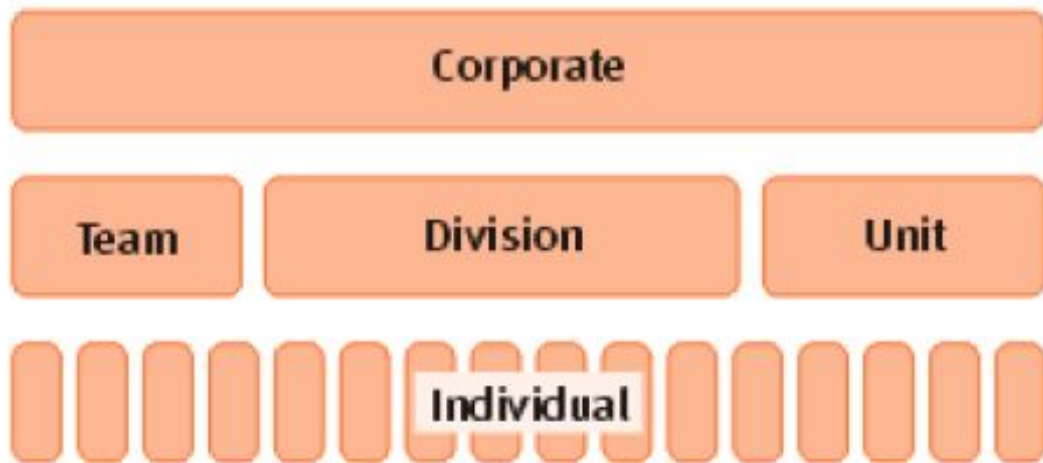
1. Corporate (Top Level )

2. Team, Division, Business Unit (Middle Level)

3. Individual (Low



## Levels of Informations Need



# Corporate (Top Level Information):

- At the top level corporate informations that is useful for the whole organization.
- This 'global' information is generally well addressed by the corporate intranet.
- Examples of corporate information include policies and procedures, HR information, online forms, phone directory, etc. Interestingly, there may be a limited amount of truly global information, and it may not deliver the greatest (measurable) business benefits.

# Team, division, business unit (Middle level)

- The middle level is perhaps the most important, as it covers all the information shared within teams, divisions, business units, etc.
- It is also being recognized that it is the 'local' information that may be the most valuable, in terms of driving the day-to-day activity of the organization.
- This information may be critical to the day-to-day activities of the group, but of little interest to the rest of the organization.
- Examples include project documentation, business unit specific content, meeting minutes, etc.

- At the lowest level the personal information need of staff exists throughout the organization.
- Examples include correspondence, reports and spreadsheets.

# Value of Information

- Economic Dimension
- Business Dimension
- Technical Dimension

- Economic dimension of information refers to the cost of information and its benefits. Generation of information costs money.

## **1. Cost of Information:**

- Cost of information may include:
  - Cost of acquiring data (get data)
  - Cost of maintaining data (store and handle)
  - Cost of generating information (create)
  - Cost related to the response time requires generating information and communicating it. (server response time)

**2. Value of Information:** Information has a cost for its acquisition and maintenance.

- Thus before a particular piece of information is acquired, decision maker must know its value.
- The information has a perceived value in terms of decision making.
- The decision maker feels more secured when additional information is received in case of decision making under uncertainty or risk.

$$VI = \text{Cost to get information} - \text{benefit}$$

### **3. Perfect Information :**

- The information is called a Perfect Information, if it wipes out uncertainty or risk completely.
- However, perfect information is a myth. The value of information is the value of the change in decision behavior because of the information.
- The change in the behaviour due to new information is measured to determine the benefit from its use.
- To arrive at the value of information, the cost incurred to get this information is deducted from the benefit.



- The value of the additional information making the existing information perfect (VPI) is:

$$VPI = (V2 - V1) - (C2 - C1)$$

- Where V is the value of the information and C is the cost of obtaining the information. V1 and C1 relate to one set of information V2, C2 relate to the new set.

- Different types of information are required by managers at different levels of the management hierarchy.
- This information used by managers at strategic planning level.
- It is because of the fact that managers at different levels are required to perform different functions in an organization.

- This dimension of information refers to the technical aspects of the database.
- It includes the capacity of

# Difference between Data Processing and Information Processing





- Data processing applies procedures to raw data to turn it into information.
- Data sets includes
  - figures
  - text excerpts
  - actions

- These pieces need to be correlated into information through finding connections in sets. This is the function of **data processing**.
- Data processing performs following operation in presents information from data sets in a valid way
  - collects
  - stores
  - cleans
  - transforms
- Without data processing, typically a data set cannot be very useful.

1. Raw data is primarily “unclean”.
2. That is, it contains many errors, so first it needs to have errors removed, a term called cleaning.
3. Without cleaning many correlations can be drawn.
4. For data processing on any platform, the data needs to be in the same format so that comparative data sets can be processed together.

**Raw Data  
(Unclean)**

**Example if you ask for contact number:**

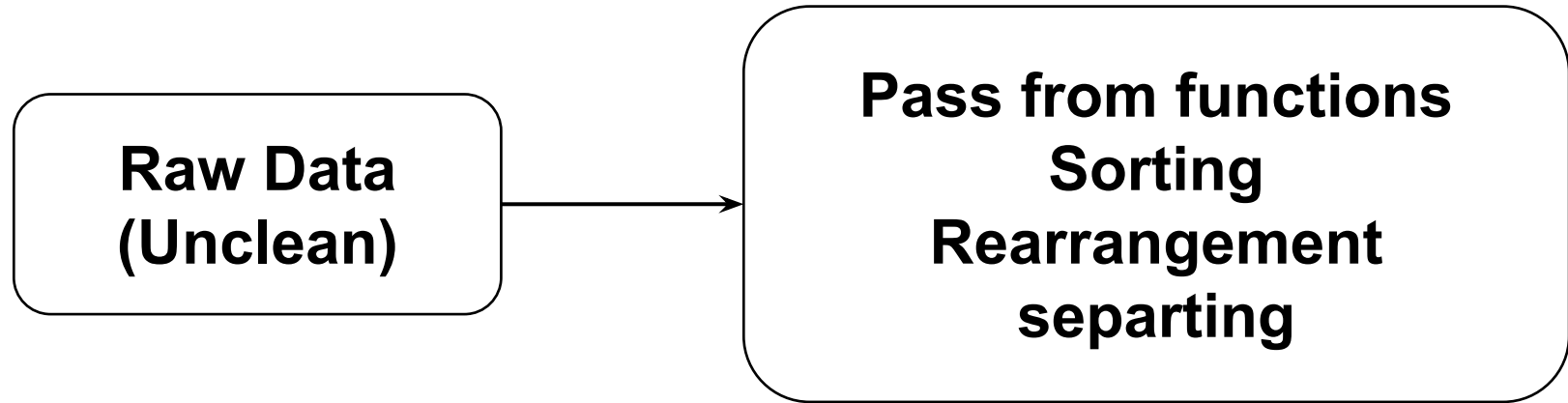
**Person 1 response +91 1111111111**

**Person 2 response +44 1111111111**

**person 3 response 2212123**

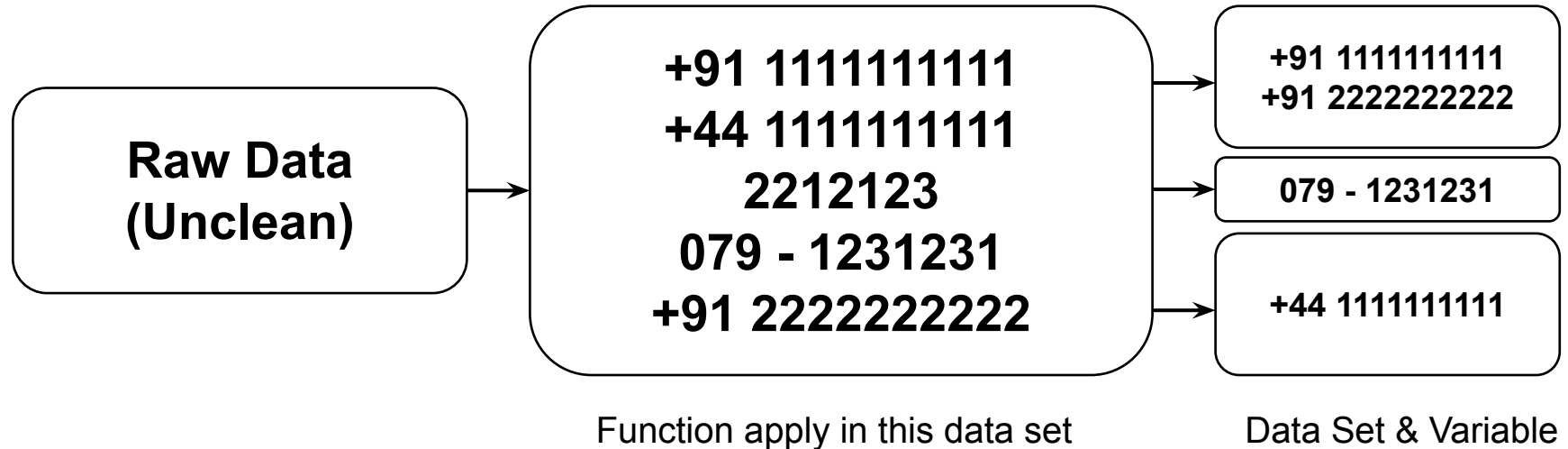
**person 4 response 079 - 1231231**

5. To provide meaningful information data sets need a range of functions which may include separating, sorting, and re-summarizing or aggregation.





6. Important relationships need to be identified, similar items grouped, some data sets will need to be broken down into variables, and some data sets combined to provide larger data sets. The final product is then presented as information.



- Information Processing do not have raw data.
- Information processing takes information and changes the form in order usually to define more meaning from it.
- In this sense, information processing has much more in common with data analytics than data processing.

- Information processing in computer terms refers to the use of algorithms to transform data.
- For Example: Changing (processing) a document (information) from screen to print, or the process of receiving a message.
- It can simply mean analyzing the world around us to draw conclusions.
- The important part is there is information: valid input, a change in that information, and a resulting question answered or conclusion drawn.

# Comparision of Data and Information Processing

1. Data processing creates information. Information processing creates actions or decisions.
2. A data processing function is meant to take raw data and turn it into meaningful information. Data analytics is a step that connects data processing to information processing, by extracting conclusions from processed data sets. From there information processing takes over.

3. Information processing is usually needs to be conducted by a human or by artificial intelligence.
4. Without data processing, information processing is not possible. Without information processing, data processing has no purpose. The two are integrally linked.
5. If you are in the business of refining raw data, data processing is your tool. If you are on the decision and communications end, you need information processing.

- **Methods of Data and Information Collection :**
- Several methods are available for the collection of data.
- The choice of method will have an impact on the quality of information.
- Similarly the design of data collection method also decides the quality of data and information.

- Following are the methods of data collection :

- Observation

- Experiment

- Survey

- Subjective Estimation / prediction

- Transaction Processing

- Purchase from Outside

- Publication

- Government Agencies