

Course Name: Management Information Systems (MIS)

Course Code: BUS405

Topic One: Data, Processing, Information and Decision Making in Organisations

1.0 Learning Outcomes

At the end of this topic, you should be able to:

- 1) Clearly define data, processing, and information.
- 2) Explain the logical relationship among data, processing, and information.
- 3) Identify examples of data, processing, and information in Nigerian organisations.
- 4) Illustrate the transformation of data into information using diagrams and tables.
- 5) Analyse the importance of information in organisational decision-making.
- 6) Apply the concepts to practical organisational situations in Nigeria.

2.0 Introduction

In modern organisations, **information** is a critical resource for **effective management**. In Nigeria's rapidly evolving business environment - from the fintech hubs of Yaba (Lagos) to the agricultural markets of Kano - success depends on speed. Organizations like MTN Nigeria, GTBank, or even a large-scale distributor in Onitsha Main Market don't just need data; they need to turn that data into insights to survive a volatile economy. Organisations in Nigeria - such as banks, universities, hospitals, ministries, and business enterprises - generate large volumes of data every day. However, raw data are not directly useful for decision-making. They must be **processed** to become meaningful information.

Therefore, understanding the *relationship between data, processing, and information is fundamental to the study of Management Information Systems (MIS)*. This topic provides a simple but comprehensive explanation of these concepts, supported with diagrams, tables, and practical examples suitable for distance learners.

3.0 Main Text

3.1 Data

Data are raw facts, figures, and observations collected from organisational activities. They are usually unorganised and lack meaning when viewed alone. For instance, a list of individual **POS (Point of Sale)** transaction amounts at the SMIT commercial area of MAU: ₦5,500; ₦12,000; ₦2,100. Alone, these are just numbers. More examples of data in Nigerian organisations may include:

- Daily sales figures in a supermarket.
- Student ID numbers in a university.
- Raw scores from an online test (`45`, `78`, `62`).
- Customer transaction records in a bank.
- Staff attendance registers in a ministry.
- Patient test results in a hospital.

Characteristics of Data:

- Raw and unprocessed.
- May be numerical, textual, or symbolic.
- Collected from various organisational sources.
- Cannot directly support decision-making without processing.

👉 At this stage, data exist as isolated facts without interpretation.

3.2 Processing

Processing refers to the systematic manipulation of data to convert them into meaningful form. It involves organising, analysing, summarising, and interpreting data. In other words, processing is the set of operations performed on data to transform it into information

Common Processing Activities:

- Sorting data into categories.
- Calculating totals and averages.
- Comparing performance across time or departments.
- Classifying and summarising data.
- Identifying trends and patterns.

Examples:

- The POS operator totals these transactions at the end of the day and categorizes them by payment method (Bank Transfer, USSD, or Card).
- Adding daily sales figures to obtain weekly totals.
- Computing students' grade point averages.
- Analysing staff attendance trends.
- Preparing financial statements from transaction records.

👉 Processing acts as the bridge between raw data and useful information.

3.2.1 Historical Evolution of Data Processing

The development of data processing can be grouped into four major eras.

A. Manual Data Processing Era: This is the earliest stage where humans processed data using simple tools.

Features:

- Use of pen, paper, and registers
- Slow and prone to errors
- Suitable for small organizations

Example: A small shop in Abuja records daily sales manually in a notebook.

B. Mechanical Data Processing Era: Machines were introduced to assist human effort.

Features:

- Use of calculators, typewriters, and tabulating machines
- Faster than manual methods
- Still dependent on human operators

Example: A bank branch uses calculators and typewriters to prepare customer statements.

C. Electronic Data Processing (EDP) Era: Computers became the main tools for processing data.

Features:

- High speed and accuracy
- Ability to handle large volumes of data
- Automation of repetitive tasks

Example: A university uses computer systems to process students' results and staff payroll.

D. Modern Digital and Intelligent Data Processing Era: Advanced technologies are now used to process data.

Features:

- Use of cloud computing, databases, big data, and AI
- Real-time processing
- Integration of systems

Example: A fintech company processes millions of online transactions instantly using digital platforms.

Evolution of Data Processing

Manual → **Mechanical** → **Electronic** → **Digital/Intelligent**
(Simple) (Machines) (Computers) (AI & Cloud)

3.2.2 Stages of the Data Processing Cycle

The data processing cycle shows the steps through which data becomes information.

I. **Data Collection (Input):** Data is gathered from various sources such as:

- Customer records
- Sales transactions
- Examination scores

Example: A supermarket collects data on daily sales from receipts.

II. **Data Preparation:** Data is cleaned and organized before processing. The activities include:

- Editing
- Sorting
- Coding
- Validation

Example: A school checks students' scores for errors before entering them into a computer.

III. **Data Processing:** Data is transformed into meaningful information. The methods used include:

- Calculation
- Classification
- Summarization
- Analysis

Example: A bank calculates total deposits and withdrawals of customers.

IV. **Output (Information):** Processed data is presented in useful formats such as:

- Reports
- Charts
- Statements

Example: A company generates monthly financial reports.

V. **Storage:** Data and information are stored for future use. This can be in the form of:

- Databases

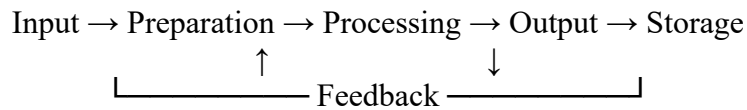
- Files
- Cloud storage

Example: A telecom company stores customer data in databases.

VI. **Feedback and Control:** Users evaluate the output to improve future processing.

Example: Management reviews reports and improves data collection methods.

Data Processing Cycle



Summary Tables

Table 1: Historical Evolution of Data Processing

Era	Key Features	Tools Used	Nigerian Example
Manual	Slow, human effort	Pen, paper	Manual shop records
Mechanical	Semi-automated	Calculators, typewriters	Bank statement preparation
Electronic	Computer-based	Computers	University result processing
Digital/Intelligent	Real-time, AI-driven	Cloud, AI, databases	Fintech platforms

Table 2: Stages of Data Processing Cycle

Stage	Description	Nigerian Example
Data Collection	Gathering raw data	Sales receipts
Preparation	Cleaning and organizing data	Checking exam scores
Processing	Transforming data	Calculating totals
Output	Producing information	Monthly reports
Storage	Saving data	Customer databases
Feedback	Evaluation and improvement	Management review

3.3 Information

Definition:

Information is processed data that is organised, meaningful, and useful for decision-making. It provides insight and understanding of organisational activities.

Characteristics of Information:

- Relevant and accurate.
- Timely and reliable.
- Meaningful and understandable.
- Useful for planning, control, and decision-making.

Examples:

- Monthly sales reports.
- Students' academic performance summaries.
- Financial statements of a company.

- Operational dashboards in banks.
- Performance appraisal reports of employees.

👉 Information reduces uncertainty and improves managerial decisions.

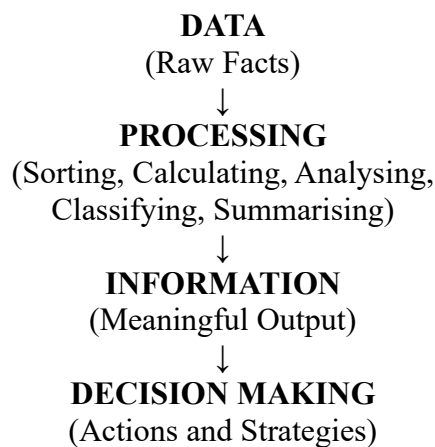
3.4 Decision Making

Decision making is the process of selecting the best course of action based on available information.

Examples in Nigerian organisations:

- A bank decides to introduce new digital services based on customer transaction data.
- A university decides to revise curriculum based on students' performance reports.
- A business decides to increase production based on sales trends.
- A hospital decides to allocate more resources based on patient statistics.

Decision making is the ultimate purpose of data and information in organisations.



Summary Table

Stage	Meaning	Example	Organisational Role
Data	Raw facts	Student scores, sales figures	Input
Processing	Manipulating data	Calculations, analysis	Transformation
Information	Meaningful results	Reports, summaries	Understanding
Decision Making	Choosing actions	Policy changes, business strategies	Action

4. The Relationship Flow: The Information Value Chain

In the Nigerian context, the flow looks like this:

1. **Input (Data):** A **Jumia** delivery rider marks 50 packages as "Customer Unavailable" in Ikeja.
2. **Transformation (Processing):** The system aggregates these "failed deliveries" and compares them against the time of day and specific streets.
3. **Output (Information):** The Logistics Manager receives a report showing that deliveries in Ikeja fail most often between 4 PM and 7 PM due to "**Go-slow**" (traffic congestion).

4. **Action (Decision Making):** Jumia adjusts the delivery schedule to dispatch Ikeja-bound riders at 6 AM to beat the traffic, increasing successful delivery rates.

5. Strategic Impact: Decisions in the Nigerian Economy

Different levels of management use MIS to navigate local challenges:

- **Operational Decisions (Low Level):** A **Fuel Station manager** in Abuja sees the "Low Stock" alert (Information) and orders a new tanker of PMS (Decision).
- **Tactical Decisions (Middle Level):** A **Regional Manager for Glo** notices a drop in data usage in Enugu (Information). They decide to launch a "Weekend Data Bonanza" specifically for that region (Decision).
- **Strategic Decisions (Top Level):** The **CEO of Dangote Cement** looks at national infrastructure trends and currency fluctuations (Information). They decide to build a new plant in a neighboring West African country to earn revenue in Dollars/CFA instead of Naira (Decision).

5. Critical Note: The "Infrastructure Factor"

In Nigeria, "Processing" often faces unique hurdles. MIS design must account for:

- **Power Instability:** Systems must have UPS/Inverter backups so data processing isn't interrupted (preventing data corruption).
- **Network Latency:** Information systems must often work "offline-first" and sync when the 4G/5G network is stable.

6. Interactive Case Study: "The Rice Merchant"

Scenario: A large rice distributor in **Daleko Market, Lagos**, tracks every bag sold.

- **Data:** 500 bags sold on Monday; 50 bags sold on Friday.
- **Processing:** The system calculates the weekly average and identifies a trend.
- **Information:** "Price of rice increased by 15% on Wednesday; sales dropped by 80% on Thursday."
- **Decision Making:** The merchant decides to offer a "Bulk Buy" discount to move stock before the next shipment arrives.

Discussion Question: If the merchant's clerk enters "500" bags but accidentally types "50" (**Bad Data**), how will this affect the merchant's bank loan application for more stock?

7. Summary

- **Data** is the raw material (The crude oil).
- **Processing** is the refinery (The NNPC refinery).
- **Information** is the usable fuel (The Petrol/PMS).
- **Decision Making** is the engine that moves the car (The Business).