

MANAGEMENT INFORMATION SYSTEM

M
I
S

- Refers to a **computer-based system** that provides managers with the tools to:
 - **Organize,**
 - **Evaluate and**
 - **Efficiently manage** departments within an organization. (providing information to the people in the organization)
- MIS** = the study of information technology in business settings
- Also refer to class of **systems used to support operational** and **tactical decision making**

- MIS involve three primary resources:
 - Technology
 - Information and
 - People
- Management information systems are regarded to be a subset of the overall internal controls procedures in a business
- Which cover the application of people, documents, technologies, and procedures used by managers, accountants to solve business problems such as costing a product, service or a business-wide strategy.

Role of MIS

- The role of MIS in an organization can be compared to the **role of heart in the body**.
- The **information is the blood** and **MIS is the heart**.
- In the body the **heart plays** the role of supplying pure blood to all the elements of the body including the brain.
- The MIS plays **exactly** the same role in the organization.

- 1. For Making easy decision** - making process by **furnishing information** in the **proper time frame**. This helps the decision - maker to select the best course of action.
- 2. Provide essential information** at each level of management to carry out their functions.
3. Help in **highlighting the critical factors** to the closely monitored for successful functioning of the organization.
- 4. Support decision-making** in both **structured** and **unstructured** problem environments.
- 5. Provide a system of procedures**, and interactive query facilities, documents for collecting, sorting, retrieving and transmitting information to the users.

6. For Predicting future business activities (Data mining)

7. Increase the technological maturity of the organization:

"Make it easier to take advantage of computer and telecommunications applications".

8. Systems Planning, Data Center Management & Operations
Management of Remote Equipment

9. Identification of Opportunities for New Systems: Systems
Analysis, Design, and Construction of New Systems

10. The MIS plays the role of information generation,
communication, problem identification.

*MIS, therefore, plays an important role in the management,
administration and operations of an organization*

Characteristics of MIS

Management-oriented:

- It is designed from the **top to work downwards**.
- It **does not** mean that the system is designed to provide information directly to the top management.
- MIS serves **all the levels of management** in an organization i.e. top, middle and lower level.

Management directed:

- When MIS is management-oriented, it should **be directed** by the management
- Because it is the management who tells **their needs and requirements** more effectively than anybody else.
- Manager should guide the MIS professionals **not only** at the **stage of planning** but also **on development**, review and **implementation stages** so that **effective system should be the end product** of the whole exercise in making an effective MIS.

Integrated:

- It means a **comprehensive** or **complete view of all the subsystems** in the organization of a company.
- The word "**integration**" means that the system has to **cover all the functional areas of an organization**
- So as to produce more meaningful management information, with a view to achieving the objectives of the organization.
- It has to consider various **sub-system** their **objectives**, **information needs**, and **recognize the interdependence**, that these subsystem have amongst themselves,
- So that common areas of information are **identified** and **processed** without **repetition** and **overlapping**

- **Common data flows:**

- The integration of different subsystems will **lead** to a **common data flow** which will further help in **avoiding duplicacy and redundancy** in data collection, storage and processing.

- **Heavy planning-element:**

- The preparation of MIS is not a one or two day exercise. It usually takes 3 to 5 years and sometimes a much longer period.
- So the system expert has to keep 2 things in mind
 - To keep future objectives as well as the firm's information well in advance
 - MIS will not be obsolete before it gets into action.

- **Sub System concept:**

- When a problem is **seen in to sub parts**, then the better solution to the problem is possible.
- MIS is viewed as a **single entity** **but** for its effective use, it should be broken down in small parts or subsystems so that more attention and insight is paid to each sub system
- it should be kept in mind that the subsystems should be easily manageable.

Cont... (Chxs of MIS)

- **Common database:**

- This is the basic feature of MIS to achieve the objective of using MIS in business organizations.
- It avoids duplication of files and storage which leads to reduction in costs.

- **Computerized:**

- MIS can be used without a computer. But the use of computers increases the effectiveness and the efficiency of the system.
- The queries can be handled more quickly and efficiently with the computerized MIS.
- The other benefits are accuracy, storage capacity and timely information.

- **User friendly/Flexibility:**

- An MIS should be flexible
- MIS should be such that it should be used independently by the end user so that they do not depend on the experts

- **Information as a resource:**

- Information is the major ingredient of any MIS

Features of MIS

MIS has **four** key features

1. Data Collection

- Organizations use an MIS to store data
- The MIS stores the information in one of **two database** systems.
- **Either by Rational database**
 - stores input from users, then relates that information
 - The database subsequently puts that information into graphs or charts so **users can compare** data
- **hierarchical database**
 - stores data in the order that it was received,
 - but provides **no comparison** tables for the user

2. Report Generation

- MIS also uses that data to **generate reports**.
- Users of the system determine the types of reports

Features of MIS

3. Accessibility and Integration

- MIS functions with open access
- Open access means that the primary MIS can be **connected to**, or **integrated with**, other systems within the business, enabling changes to data from different sources and from multiple locations
- This function provides **two important outcomes**.
 - Organizations can **update the system** to provide information and
 - the system can be **maintained without needing professional** service personnel.

4. Scalability

- An important feature of an MIS is that businesses can **purchase a small version of a system** and then, over time, add to it as finances allow
- Businesses can **add increased data capabilities**, as well as **system features**, to the initial system as the business grows

Components of MIS

1) Marketing Research System (MRS)

- Marketing research can be seen as the **systematic** and **objective research for analysis of data** and **information** relevant to the identification and solution of any problem in the **field of marketing**.

2) Internal Record System (IRS)

- Marketing managers get **lots of information** from the internal-records of the company.
- These records provide **current information** about **sales**, **costs**, **inventories**, cash flows **and account receivable and payable**.
- Many companies maintain their internal records in computer System it **help marketing managers** to **gain faster access** to reliable information.



3) Marketing Intelligence System (MIS)

- It collects information from **external sources** (magazines, trade journals, commercial press...) about **current marketing-environment** and **changing conditions in the market**.
- This information **cannot** be collected from the **Annual Reports of the Trade Association and Chambers of Commerce**, Annual Report of Companies, etc.
- The information which is collected from the external sources **cannot be used directly**.
- It must be first **evaluated and arranged** in a proper order. It can be then used by the marketing manager for **taking decisions** and making policies about marketing.
- So, marketing intelligence is an important component of MIS

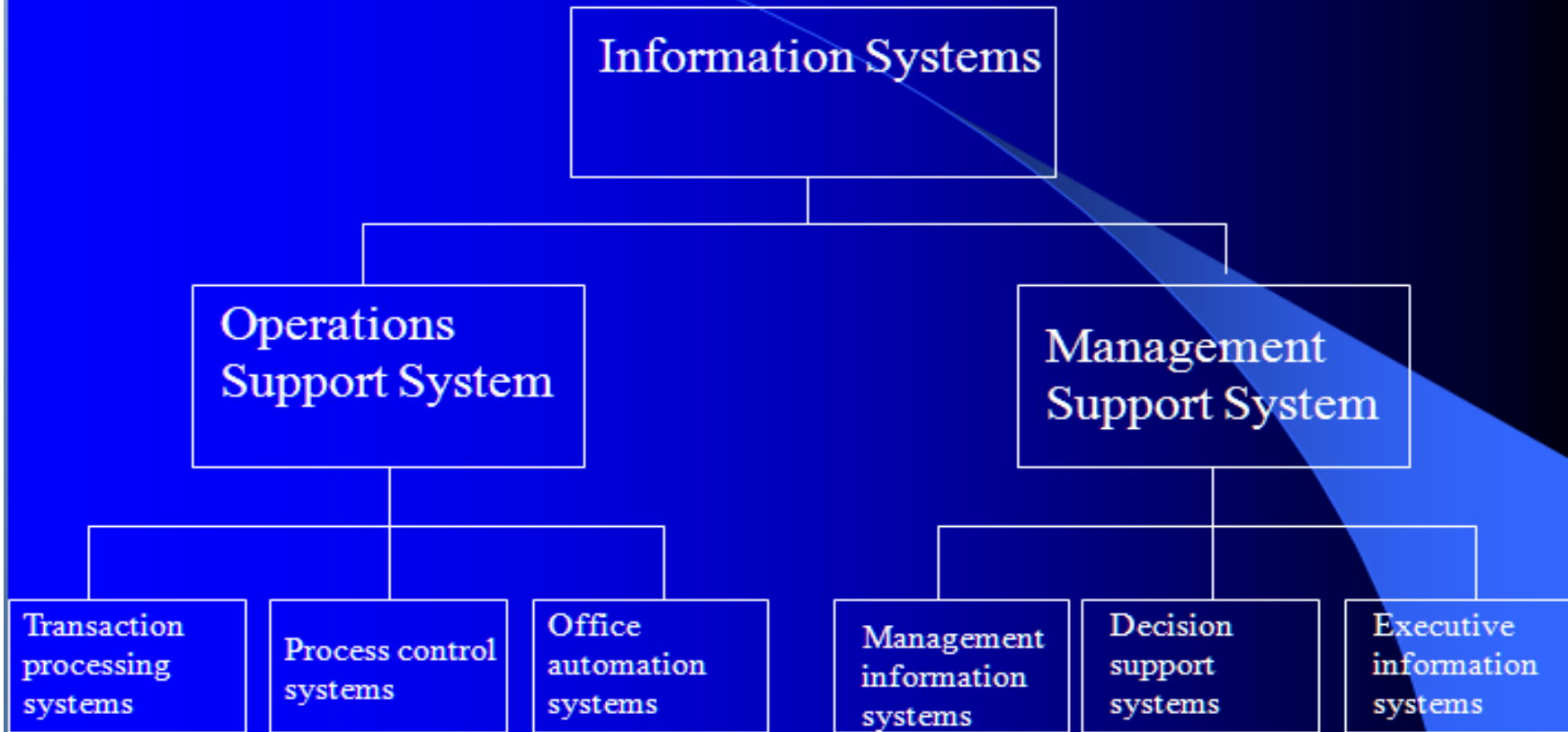
4) Decision Support System(DSS)

- It is a computer-based information system that **supports** business or organizational **decision-making activities**.
- These are the tools which **help** the marketing managers **to analyze data and to take better marketing decisions**.
- They include **hardware**, i.e. computer and **software** programs.
 - **Computer** helps the marketing manager to **analyze the marketing information**. It also helps them to take better decisions.
- In fact, today marketing managers cannot work without computers. There are many software programs, which help the marketing manager to do **market segmentation, price fixing, advertising budgets**, etc.

Aim of Management Information System

- The main **aim** of MIS
 - To **inform management** and help them to make **better decisions** about management and **the way the business is run**.
- The basic **objective** of MIS:
 - To provide information **support to the management** in the organization for decision making.

Classification of IS



- Information systems have always been needed to **process data, and used in business operations**, Such

1. Operations support systems produce a variety of **information products** for internal and external use.

Major categories are:

- **Transaction processing systems** are important of operations **support** systems that **record and process** the data **resulting** from business transactions.
- **Process control systems** **monitor and control** **physical processes**. **For example**, a petroleum refinery uses **electronic sensors** linked to computers to monitor chemical processes continually and **make instant (real-time) adjustments** that control the refinery process.
- **Enterprise collaboration systems** enhance team and **workgroup communications** and **productivity** and include applications that are sometimes called **office automation systems**. For example, e-mail to send and receive e-messages or use videoconferencing to hold electronic meetings to coordinate their activities.

1) Transaction processing systems

- Transaction Processing System is **operational-level systems** at the bottom of the pyramid.
- They are usually operated directly by **shop floor workers** or **front line staff**, which provide the key data required to support the management of operations

The role of TPS

- ✓ **Produce information** for other systems
- ✓ Handle routine tasks and **Perform simple calculations**
- ✓ Used by **operational personnel + supervisory levels**
- ✓ **Efficiency oriented**
- ✓ Process business **exchanges**
- ✓ **Maintain** records about the exchanges

Some examples of TPS

- Payroll systems
- Registration system,
- student transcript system and , curriculum class control systems
- Order processing systems
- Reservation systems
- Stock control systems
- Systems for payments and funds transfers

Primarily support:

- Clerical personnel
- Operational-level managers

TPS are ultimately little more than simple data processing systems.

Functions of a TPS in terms of data processing requirements

<i>Inputs</i>	<i>Processing</i>	<i>Outputs</i>
Transactions-Events	Validation	Lists
	Sorting	Detail reports
	Listing	Summary reports?
	calculation	Action reports
	Updating	

2. Management Support Systems

- When information system applications focus on providing information and support for effective decision making by managers, they are called management support systems.

Major categories are

1. **Management information systems (MIS)** provide information in the form of reports and displays to managers and many business professionals.
2. **Decision support systems (DSS)** give direct computer support to managers during the decision-making process.
 - Ex. A production manager may use a DSS to decide how much product to manufacture?, based on the expected sales associated with a future promotion and the location and availability of the raw materials necessary to manufacture the product.
3. **Executive information systems (EIS)** provide critical information from a wide variety of internal and external sources in easy-to-use displays to executives and managers.

i) Management Information Systems

- Management Information Systems are **management-level** systems that are used by **middle managers**(Used at **tactical level**)
- Help to ensure the **smooth running of the organization**.
- **highly structured information** provided by these systems allows managers to **evaluate an organization's performance** by comparing current with previous outputs.

The role of MIS

- Based on **internal information flows**
- Support **relatively structured** decisions
- Used by lower and middle managerial levels
- Deals with the **past and present rather** than the future
- Efficiency oriented

- **Reports data and information** rather than details of transaction processing
- **Assist managers** in situations, **evaluating conditions**, and determining what actions need to be taken.
- Provides information **pre-specified reports formats**, either in print or on-screen.
- MIS serve managers primarily interested in weekly, monthly, and yearly results
- MIS enable managers to **drill down to see** daily or hourly data if required and it use **transaction data** as **main input**

Some examples of MIS

- Sales management systems
- Inventory control systems
- Budgeting systems
- Management Reporting Systems (MRS)
- Personnel (HRM) systems

MIS are built on the data provided by the TPS

Functions of MIS in terms of data processing requirements

<i>Input</i>	<i>processing</i>	<i>output</i>
Internal Transactions	Merging	Summary reports
Internal Files	Summarizing	Action reports
Structured data	Sorting	Detailed reports

ii) **Decision Support System**

- Interactive support for **non-routine decisions** or problems
- **End-users are more involved** in creating a DSS than an MIS
- Supplements an MIS
- Pulls information from **variety of databases**.
- **Model** – mathematical representation of real-life system
- **Simulation** – **using a computer model** to reach a decision about a real-life situation
- Used at tactical and strategic level

Some examples of DSS

- Group Decision Support Systems (GDSS)
- **Computer Supported Co-operative work (CSCW)**
- Logistics systems
- Financial Planning systems
- **Spreadsheet Models**

DSS manipulate and build upon the information from a **MIS and/or TPS** to generate insights and new information.

Functions of a DSS in terms of data processing requirements		
Input	processing	Output
Internal Transactions Internal Files External Information	Modeling Simulation Analysis Summarizing	Summary reports Forecasts Graphs / Plots

The role of DSS

- Support full- structured or semi-structured decisions
- Have analytical and/or modeling capacity
- Used by more senior managerial levels
- Are concerned with predicting the future
- Are effectiveness oriented

iii) Executive information systems

- provide critical information tailored to **the information needs of executives**
- High level with drill down
 - Overall vision; company goals ,Long-term objectives
 - Organizational structure
 - Staffing and labor relations
 - Crisis management and Control of overall operations
- Access to **information from external** sources
- Used at **strategic** level

The role of EIS

- Are concerned with ease of use and predicting the future
- Are **effectiveness** oriented
- Are highly flexible
- Support unstructured decisions
- **Use internal and external data sources**
- **Used only at the most senior management level**

EIS organizes and presents data and information from both external data sources and internal MIS or TPS in order to support and extend the inherent capabilities of senior executives.

Functions of a EIS in terms of data processing requirements

<i>Input</i>	<i>processing</i>	<i>Output</i>
External Data Internal Files Pre-defined models	Summarizing Simulation "Drilling Down"	Summary reports Forecasts Graphs / Plots

Other categories

A. Expert systems

- Are knowledge-based systems that provides **expert advice** and **act as expert** consultants to the users

B. End user computing systems

- Support the **direct, hands on use of computers** by end users for **operational** and **managerial** applications

C. Business information systems

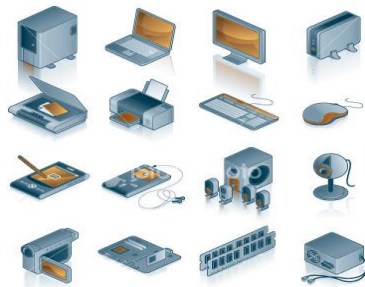
- Support the **operational** and **managerial** applications of the basic **business functions** of a firm

D. Strategic information systems

- Provide a firm which **strategic products**, services, and **capabilities** for **competitive advantage**

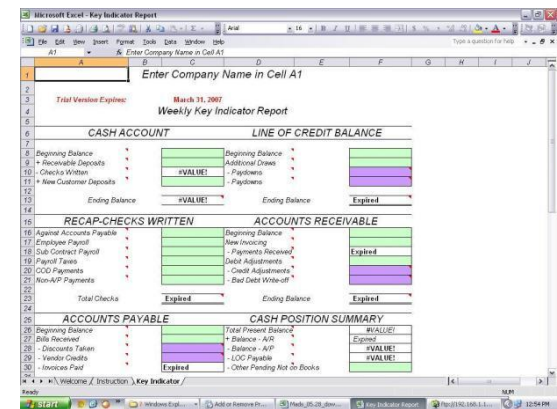
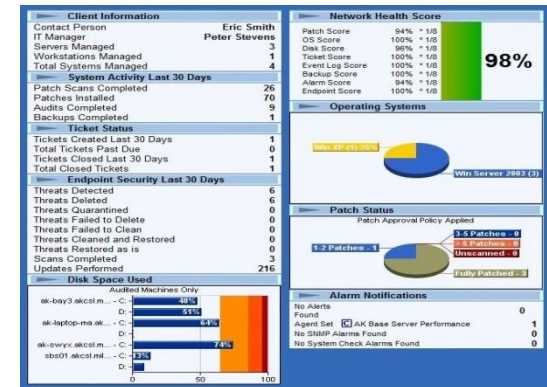
Elements of MIS

1. Hardware
2. Software
3. Databases and application programs
4. People
5. Telecommunications and Networks



Outputs (types of report) Of a MIS

- **Scheduled reports** which are produced periodically, or on a Schedule (daily, weekly, monthly).
- **Key-indicator report** which summarizes the previous day's critical activities and also it is typically available at the beginning of each day.



- **Demand report** which gives certain information at a manager's request.
- **Exception report** which is automatically produced when a situation is unusual or requires management action.
- Inputs: Information from the TPS

Market Demand Report

- **Market Demand Analyzer – Available by Industry or Commodity and Country**

Market Demand by End-market Sectors: Investment Goods & Intermediate Sales to Other Industry and Service Sectors

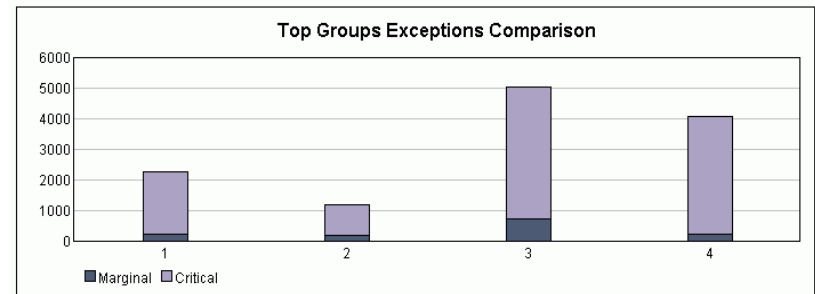
- Agriculture
- Mining & Minerals
- Food
- Textiles, Wearing Apparel, Footwear
- Wood & Furniture
- Paper & Publishing
- Basic Chemicals
- Fertilizers & Pesticides
- Misc. Chemical Products
- Pharmaceuticals
- Soaps & Cleaning Preparations
- Non-metallic Mineral Products
- Basic Metals
- Machinery except Computers
- Computers & Peripherals
- Electrical Machinery
- Telecom. & Semiconductors
- Motor Vehicles
- Other Transport Equipment
- Professional & Optical Equip.
- Miscellaneous Manufactures
- Utilities
- Construction
- Wholesale & Retail Trade
- Restaurants & Hotels
- Transport & Storage
- Communications
- Financial & Insurance
- Real Estate & Business Services
- Personal Services

Market Demand by End-market Sectors: Personal Consumption Expenditures and Government Purchases of Finished Goods

- Personal Consumption Expenditures
- Food, beverages and tobacco
- Clothing & Footwear
- Housing expenses
- Furniture & Household equipment
- Household operations
- Medical care and health expenses
- Personal Transportation
- Other transportation & communications
- Education
- Entertainment and cultural
- Personal Care
- Restaurants, cafes and hotels
- Other Services

Quarterly Application Exception Report for Top Groups

Q2 2003



Label	Group	Marginal Exceptions	Critical Exceptions	Total Exceptions	Average Daily Traffic Class Count
1	Dev.net Compression Shapers	267	2,042	2,309	162
2	GroupA	228	1,003	1,231	147
3	GroupB	779	4,322	5,101	474
4	Kris-CompressionLab	281	3,865	4,146	581

Applications of MIS

- Many organizations are **structured based** on functional areas.
- Typically, functional areas include
 - Finances
 - Human resources
 - Marketing, etc. these functional areas have their own **Management Information System**, or MIS.

Financial MIS

- It provides **financial information** for **managers** to make daily decisions on operations within the organization.

Financial MIS provide these functions:

- Integrate financial information from multiple sources
- Provide easy access to financial information in summarized form using easy-to-use tools
- Compare historic and current financial activity
- A financial MIS often has a number of subsystems, depending on the type of organization.
- These include systems to analyze revenues, costs and profits, auditing systems for both internal and external purposes and systems to manage funds.
- A financial MIS can also be used to prepare reports for third parties, such as external auditors or shareholders.

Manufacturing of MIS

- A typical it is used to **monitor the flow of materials and products** throughout the organization.
- In a manufacturing process, raw materials or parts are transformed to finished products, and a manufacturing **MIS is used at every stage.**

Common Subsystems in a manufacturing MIS include:

- Design
- Production Scheduling
- Inventory Control
- Materials Planning
- Quality Control and Process Control

Transportation and Logistics of MIS

- Route and schedule optimization

Marketing MIS

- It supports activities throughout many **activities of marketing departments.**

Typical **subsystems of a marketing MIS** are

- Marketing research,
- Product development
- And Delivery, promotion and advertising, product pricing and sales analysis.
- One of the most **common uses** of a marketing MIS is to **produce sales reports.**
- These are typically **produced on a regular schedule,** such as by week, month and quarter.

MIS Implementation

- **MIS implementation** process involves a **number of sequential steps**
 - First **establish management information needs** and formulate broad systems objectives so as to delineate important decision areas
 - **Develop a general description of a possible MIS** as a coarse design
 - A. Once the information units needed have been determined and a systems design developed,
 - B. **Decide** how information will be **collected**.
 - C. Positions will be **allocated responsibility** for generating and packaging the information.
 - D. **Develop a network** showing information flows.
 - E. **Test the system** until it meets the operational requirements
 - F. **Re-check** that all the critical pertaining to various sub-systems and for the organization as a whole are fully captured.
 - G. **Monitor actual implementation** of the MIS and its functioning from time to time