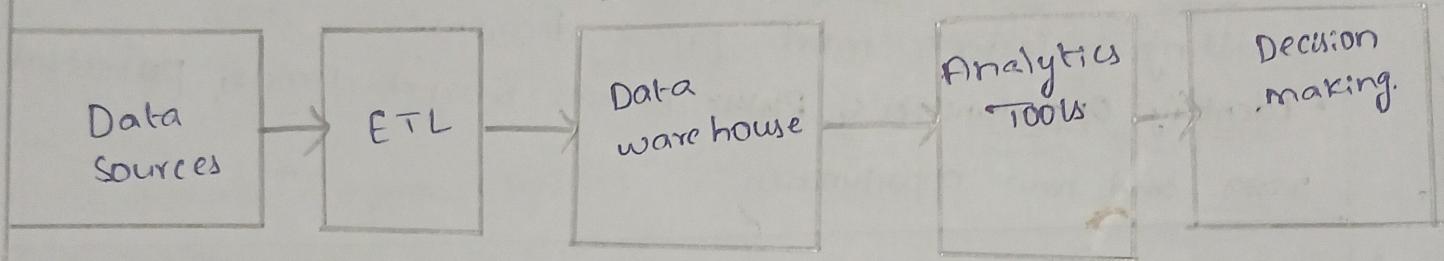


## Q) What is information system?

A. An information system is a system that gathers data from different sources, processes it, & provides insights (Often using dashboards, reports & visualizations) to help businesses make strategic & operational decisions.

### Information System



### Role in BI & Analytics

#### ① Data collection & Integration:

Gathers data from internal sources such as sales, finance, marketing, operations & from external sources.

#### ② Data Storage:

Uses data warehouses (or) data lakes to store structured and unstructured data efficiently for quick access & analysis.

#### ③ Data processing:

Cleans, transforms, and prepares raw data for analysis, ensuring consistency and quality.

#### ④ Data Analysis:

Employs BI tools like Power BI, Tableau, and Statistical languages (Python R) to uncover patterns, trends and insights.

## ⑤ Decision Support

Presents findings through interactive dashboards, KPI's & predictive models, enabling managers to make evidence-based decisions.

### Example:-

- Sales Dashboard: Monitors revenue, customer segments & trends to support sales planning.
- Customer Analytics System: Analyzes customer data to predict buying behaviour & refine marketing strategies.

### Purpose:-

- Enhance decision making: Delivers timely & accurate information, resulting in faster & more precise decisions.
- Identify Opportunities & Risks: Detects market trends, potential risks and new opportunities.

## 2) Describe the level of DSS with examples.

### A. Levels of Decision Support System (DSS):

Decision support system can be categorized into several key types based on the nature of problems they address & the kind of support they provide.

Here are the major levels of DSS.

- ① Data-Driven DSS
- ② Model-Driven DSS
- ③ Knowledge-Driven DSS
- ④ Document-Driven DSS
- ⑤ Communication-Driven DSS.

#### ① Data-Driven DSS:

Focuses on accessing, managing & analyzing large volumes of structured data (internal / external databases).

Ex:-

- ① Business Intelligence systems that generate sales reports & dashboards using transactional data.

- ② Inventory tracking systems that monitor stock levels & sales trends.

#### ③ Model-Driven DSS

Centers around mathematical, financial, (or) simulation models to analyze scenarios & optimize outcomes.

Ex:-

- ① financial planning tools for budgeting & forecasting.

- ② Scheduling software for project management (or) logistics.

#### ③ Knowledge-Driven DSS

Uses expert knowledge, rules (or) artificial intelligence to offer recommendations based on domain-specific expertise.

Ex:-

- ① medical diagnosis systems suggesting treatments based on symptom input & medical history.

- ② Product recommendation engines tailored to user preferences.

#### ④ Document-Driven DSS

Retrieves & manages unstructured information (documents, policy files, manuals, webpages) for decision support.

Ex:-

- ① Legal advisory DSS that helps lawyers find relevant case law (or) legal documents.

- ② Search engines within an enterprise for company policies & procedures.

#### ⑤ Communication-Driven DSS

facilitates group collaboration & decision-making by enabling information sharing & communication.

Ex:-

- ① Online collaboration platforms for group decision-making decisions.

- ② Group Decision Support System (GDSS) for organizing teleconferences (or) brainstorming meetings.

3) Describe the role of information Systems in decision support.

① Data collection, storage & Management:

- Information system gather & store large volumes of data from various sources - such as,
  - Sales, Operations, finance and external environments.
- They organize this information in databases & warehouses, making retrieval & analysis efficient & reliable.

② Processing & Analyzing Data:

- They process raw data into meaningful information through data cleaning, transformation & aggregation.
- Analytical tools & models within information systems help identify trends, correlations and patterns essential for decision-making.

③ Providing timely & Accurate information:

- Information systems ensure that decision makers have access to real time & historical data, improving quality & decisions.
- Automation with these systems reduces human errors.

④ Supporting all phases of Decision-making:

- Intelligent phase- Identifies problems & opportunities using reports, alerts, monitoring tools.
- Design phase- Helps generate & evaluate alternative solutions using modelling & simulation.
- choice phase- Assists managers in comparing options & forecasting outcomes, supporting selection of the best course of action.

⑤ facilitating communication & collaboration:

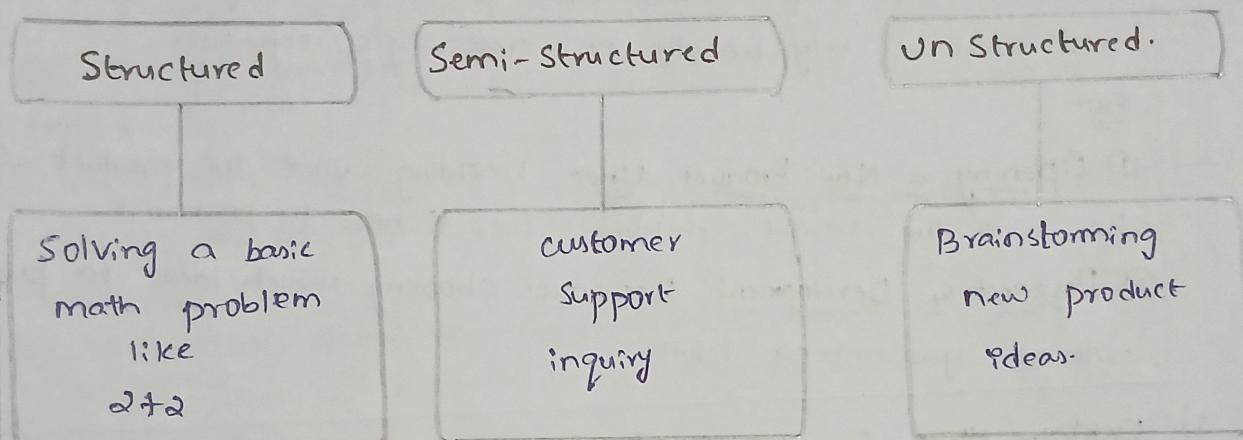
- Modern information systems enables teams to collaborate, share data & insights, & co-ordinates decision-making across departments (or) locations.

## ⑥ Enabling flexibility & Adaptability:-

- Information systems allows organizations to quickly adapt strategies & operations in response to changes in the business environment, regulatory landscape, (or) market conditions.

4) Explain the different types of problem structures with example.

### A. Types of problem structures:-



### ① Structured Problems:-

Definition: These problems are routine, repetitive and well-defined. All variables, constraints & solutions are clear & standard -ized. Solutions often follow established rules (or) procedures.

#### Example:-

- ① Processing Payroll: Calculating employee salaries based on formulas.
- ② Inventory Re-order: Restocking inventory when levels fall below a set threshold.

### ② Semi- Structured Problems:-

Definition: These contain some well-defined elements but also include aspects that require human judgement. Not all variables (or) solutions are fully specified; a mix of computational & experiential input is needed.

Ex:-

- ① Sales forecasting: Some data (historical sales) is precise, but future predictions require judgement about trends.
- ② Budget Management: Part of the process is based on numeric rules, but managers may adjust budget allocations based on experience.

### ③ Unstructured Problems:

Definition: These problems are novel, poorly defined & lack a clear solution road map. Information is often ambiguous (or) incomplete and solutions rely heavily on creativity & expertise.

Ex:-

- ① Opening a New Product Line: Deciding what the product should be, who the target customers are, & how to position it.
- ② Research & Development Decisions: Choosing which ideas to pursue with no guaranteed results.

5) Explain the framework of Business intelligence with an example.

A) A Business intelligence is a structured approach that defines how data is collected, managed, analyzed & turned into actionable insights for decision-making. It integrates technologies, processes & people to convert raw data into useful business information.

#### Key components of a BI framework:

##### ① Data Sources:

Data originates from multiple internal & external sources. These could be structured (databases) (or) unstructured (documents, emails) data.

Ex:- Sales data from stores & e-commerce, supply chain logs, market trend data.

##### ② Data Integration:

ETL (Extract, Transform, Load) consolidate data from diverse sources, clean & standardize it, & load it into a central repository, such as data warehouse (or) data lake.

Ex:- ETL processes pull all data nightly into a central data warehouse.

#### ③ Data Analysis & Modeling:

Analytical tools & models uncover patterns, trends & relationships in the data. This step can be passive (or) active.

Ex:- BI tools identify fastest-selling products, underperforming stores & seasonal demand patterns.

#### ④ Data Storage:

Data warehouses & data marts store cleansed & organized data. They allow for efficient querying & analysis, supporting both historical & current data needs.

Ex:- The data warehouse holds sales transactions, stock levels & external benchmarks.

#### ⑤ Information Presentation:

Insights are presented to users via reports, dashboards, visualizations and alerts.

Ex:- Interactive dashboards visualize daily sales, inventory turnover & highlight stores where stockouts are frequent.

#### ⑥ Decision Support:

BI outputs are used by decision makers at all organizational levels - strategic, tactical & operational - enabling fact-based & timely decisions.

Ex:- The operations manager receives alerts about low-stock items, enabling faster restocking decisions.

### 6) Differentiate between Business Intelligence & Business Analytics.

A. Aspect	Business Intelligence	Business Analytics
Definition	Focuses on using historical & current data to describe & monitor business performance.	Uses data, especially advanced statistical & predictive methods, to forecast & guide future decisions.
Main focus	Descriptive analytics: Answers "what happened?" & "how is the business"	Predictive & prescriptive analytics: Answers "why did it"

performing now?"

"happen?" & "what will happen next?"

### Time Orientation.

concentrates on past & present events, helping organizations understand trends & patterns.

Oriented towards the future, focusing on predictions & actionable strategies for growth.

### Key activities

Reporting, dashboards, monitoring KPIs.

Data mining, forecasting, statistical modeling, optimization.

### End users.

Managers, executives, Operations; generally non-technical decision makers.

Analysts, data scientists, business strategists.

### Tools

BI platforms (Power BI, Tableau, Qlik, SAP)

Analytical or statistical tools (R, Python, SAS, advanced Excel, ML libraries).

### Example:

Using dashboards to monitor sales, financials or daily operational performance in real time

Predicting customer churn, sales forecasting, or optimizing resource allocation based on data models.