
INFORMATION TECHNOLOGY
PRALAY JANA

Introduction to Information Technology

What is Introduction to Information Technology ?

Information Technology (IT) refers to the **use of computers, software, networks, and other digital systems** to **store, process, transmit, and manage information**.

Core Components of IT

- **Hardware** – Physical devices (computers, servers, routers, etc.)
- **Software** – Programs and operating systems that run on hardware
- **Networking** – Connecting systems for data sharing (Internet, LAN, WAN)
- **Data** – The raw facts that are processed into meaningful information
- **People and Processes** – Users, IT professionals, and workflows managing systems

Importance of IT:

- **Automation** of tasks and operations
- **Efficient communication** (email, messaging, video calls)
- **Data storage and analysis** for decision-making
- **Global connectivity** through the internet
- **Innovation** in fields like healthcare, finance, education, and entertainment

FUNDAMENTALS OF INFORMATION TECHNOLOGY

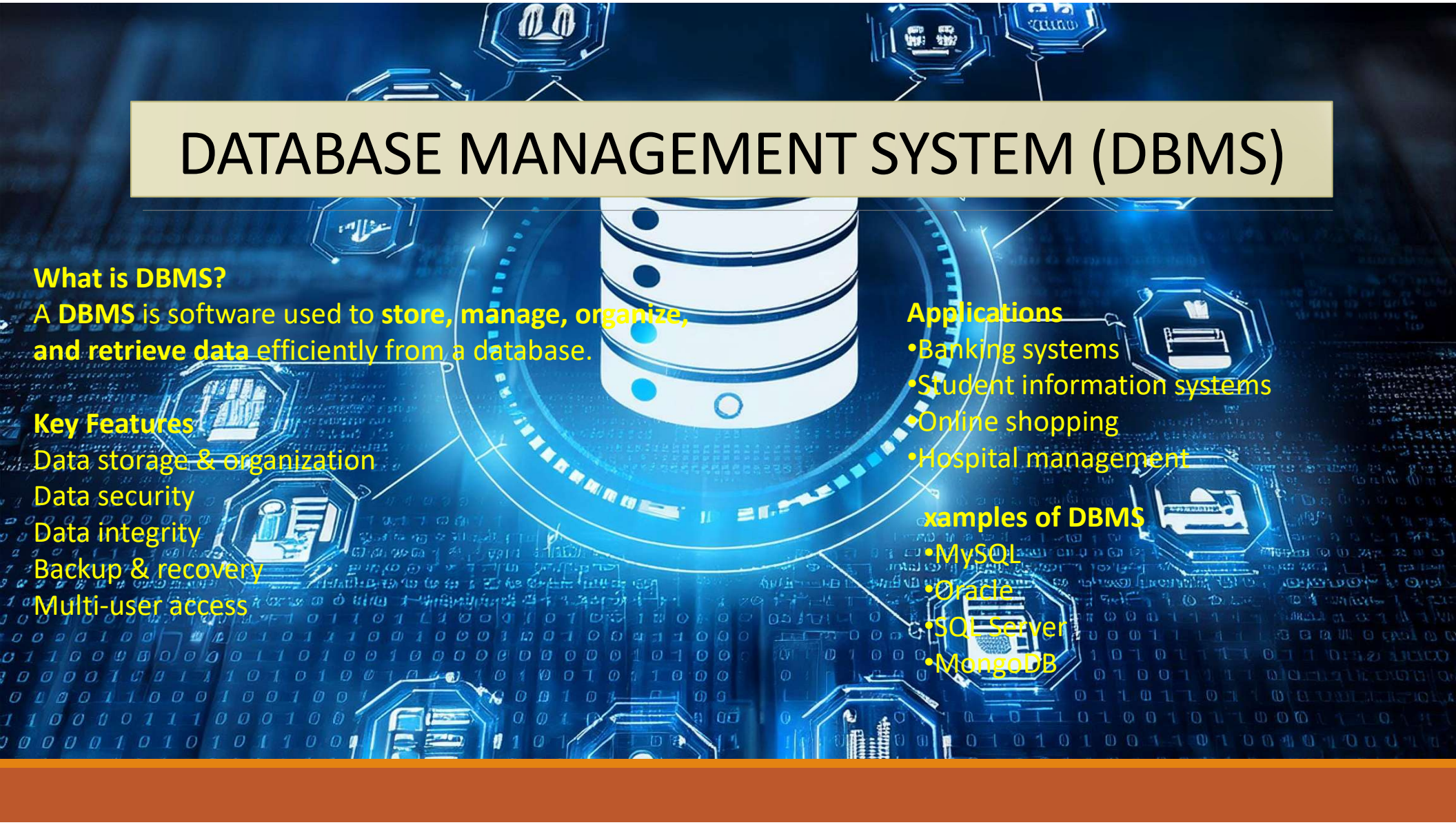
Applications of IT

- Education (Online learning)
- Business (ERP, CRM)
- Banking (ATM, Online Banking)
- Healthcare (Digital records)
- Government (E-governance

IT Key Concepts:

- Information Technology (IT)
- Data & Information
- Hardware
- Software
- Operating System
- Application Software
- Input Devices
- Output Devices
- Storage Devices
- CPU (Processor)

DATABASE MANAGEMENT SYSTEM (DBMS)



What is DBMS?

A **DBMS** is software used to **store, manage, organize, and retrieve data** efficiently from a database.

Key Features

Data storage & organization
Data security
Data integrity
Backup & recovery
Multi-user access

Applications

- Banking systems
- Student information systems
- Online shopping
- Hospital management

xamples of DBMS

- MySQL
- Oracle
- SQL Server
- MongoDB

ROLE OF IT IN BUSINESS OPERATIONS

IT supports major business functions:

- **Finance:** Accounting systems, payroll automation
- **HR:** Employee management systems
- **Operations:** Inventory & supply chain management
- **Marketing:** Digital campaigns & analytics
- **Customer Service:** CRM tools

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- Impact of IT
- Improved customer satisfaction
- Faster business operations
- Improved accuracy & efficiency
- Better decision-making
- Cost reduction

OVERVIEW OF MODERN BUSINESS SYSTEMS

- SAP ERP:-Strong finance, logistics, HR
- Oracle ERP Cloud:-Strong financial management
- Microsoft Dynamics 365:-Manages customer relationships.
- Odoo:-Cost-effective
- NetSuite ERP:-Ideal for fast-growing companies

Types:

1. ERP (Enterprise Resource Planning)
2. CRM (Customer Relationship Management)
3. SCM (Supply Chain Management)

ENTERPRICE RESOURCE PLANNING

Enterprise Resource Planning (ERP) is an integrated system that manages and automates all core business processes using a single centralized database.

Feature	Description
Centralized Database	Stores all business data in one place for easy access and consistency.
Integration of Functions	Combines processes across departments (e.g., HR, Finance, Sales).
Automation	Reduces manual work and errors by automating repetitive tasks.
Real-Time Reporting	Provides instant access to business insights and performance metrics.
Customization	Can be tailored to fit specific business needs.

IT STRATEGY AND BUSINESSTRATEGY,ALIGNMENT CAPABLITY

Business strategy, IT strategy, and alignment capability are interdependent:

- **Business strategy** sets the overall goals.
- **IT strategy** defines how technology will support those goals.
- **Alignment capability** is the organization's ability to effectively coordinate the two.

1. Business Strategy

Explanation:

Business strategy defines the organization's long-term goals and how it will compete in the market.

Example:

A retail company's business strategy is to **increase customer satisfaction and sales** by offering faster service and personalized shopping.

IT Strategy

Explanation:

IT strategy explains how technology will be used to support and achieve business goals.

Example:

To support faster service, the company adopts **ERP and CRM systems** to manage inventory and customer data efficiently.

3. Alignment Capability

Explanation:

Alignment capability is the organization's ability to coordinate business strategy and IT strategy so they work together effectively.

- **Example:**
  Good communication between IT and business teams
- Strong leadership and collaboration
- Shared goals and understanding
- Flexible processes
- Governance and change management

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HOW THEY WORK TOGETHER ALGINMENT CYCLE

- Business Goals
- ↓
- Business Requirements
- ↓
- IT Planning & Solution Design
- ↓
- System Development (ERP / CRM)
- ↓
- Testing & User Feedback
- ↓
- Implementation & Training
- ↓
- Performance Review
- ↓
- Continuous Improvement

DIFFERENCE BETWEEN DATA

A **data type** tells the computer **what kind of data a variable can store** and **what operations can be done on it**.

1. Structured Data

Definition

Structured data is data that is **organized in a fixed format** (rows & columns) and follows a **predefined schema**.

Key Points

- Well-organized
- Easy to store, search, and analyze
- Stored in tables (rows & columns)

Examples

- Excel sheets
- Databases (tables)
- Student records (ID, Name, Marks)

2. Semi-Structured Data

Semi-structured data is data that **does not follow a strict table structure** but **has some organization using tags or keys**.

Key Points

•No fixed rows & columns
•Contains labels, tags, or keys
•Partially organized

Examples

•JSON files
•XML files
•Email data (To, From, Subject + body)

3. Unstructured Data

Unstructured data is data that **has no predefined format or structure**.

Key Points

•Completely unorganized
•Harder to analyze
•Largest type of data in the real world

Examples

•Text documents
•Images,vedio,audio file

COMMON DATA SOURCE

Organizations use different **data sources** for analysis and decision-making. These include **internal data, third-party analytics, external data, and open data**.

1.Inte:rnal Data:

Internal data is the data **generated and stored within an organization** during its day-to-day operations.

Examples:

- Sales records, invoices, billing data
- Customer details from CRM
- Employee records, attendance, payroll
- Inventory and stock levels
- Production and logistics data

Key Points:

- Usually stored in **internal databases**, ERP, CRM, HR systems.
- Considered **reliable and confidential**.
- Main source for **management reports, KPIs, and performance analysis**.

2.Third-Party Analytics:

Third-party analytics refers to **data and insights provided by external analytics service providers** or platforms that collect and analyze data on behalf of many clients.

Examples:

- Website traffic data from tools like Google Analytics
- Social media analytics from platforms or marketing tools
- Market research reports bought from research firms
- Advertising performance data from ad platforms

Key Points:

- Helps organizations understand user behaviors, marketing performance, trends.
- Often provided via dashboards, reports, or APIs.
- Useful when a company doesn't have its own advanced analytics tools.

3.External Data:

External data is data that comes from **outside the organization**, collected from other companies, institutions,

Examples:

- Market trends and competitor information
- Customer demographics from external agencies
- Industry reports and statistics

Key Points:

- Used to understand the business environment and competition.
- Often obtained through subscriptions, data vendors, industry bodies.
- Complements internal data for better forecasting and strategy.

4.Open Data:

Open data is data that is **freely available to everyone** to use, reuse, and share, usually published by **governments, public organizations, or international bodies**.

Examples:

- Government census data
- Health, education, and crime statistics
- Weather and climate data
- Transport and traffic data
- Open data portals (national or city-level)

Key Points:

- Generally free or low-cost.
- Promotes research, innovation, transparency, and public services.
- Can be combined with internal data for deeper analysis and insights.

DATA COLLECTION METHOD

Data collection is the process of **gathering information** from various sources to **answer questions, test hypotheses, or make decisions**. It is used in **research, business, education, government, and data analytics**.
Types of Data (Based on Nature)

1.Qualitative Data (Non-numerical)

- Descriptive, textual information
- Answers "**why**" and "**how**"

Examples: opinions, feedback, comments, interview responses

2. Quantitative Data (Numerical)

- Data in numbers
- Answers "how much", "how many"

Examples: marks, sales figures, age, income, rating (1–5)
Data collection methods are often chosen based on whether you need **qualitative** or **quantitative** data.

TYPES OF DATA COLLECTION (BASED ON SOURCE)

a) Primary Data Collection:

Data collected **first-hand** by the researcher for a specific purpose.

Methods: **surveys, interviews, experiments, observations, focus groups**.
Advantage: **Original and specific**
Disadvantage: Takes **more time and cost**.

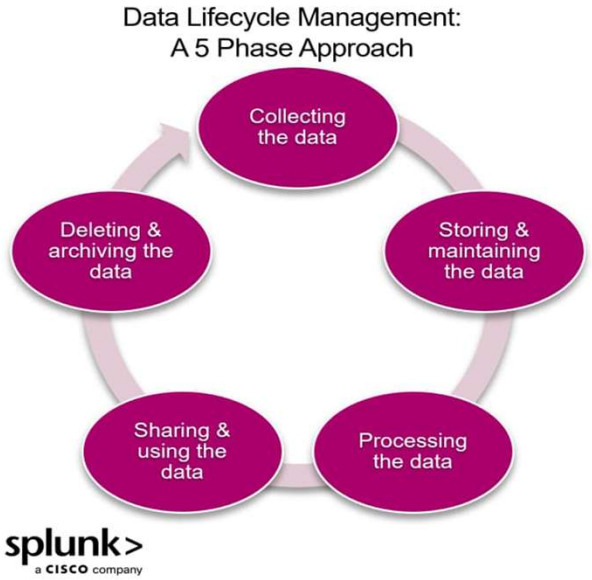
b) Secondary Data Collection:

Data collected **from existing sources** that were gathered by others.

Sources: books, websites, reports, research papers, government data.
Advantage: **Quick and cheap**
Disadvantage: May be **less relevant or outdated**.

INTROUDUCTION TO DATA LIFECYCLE MANAGEMENT (DLM)

- **Data Life Cycle Management (DLM)** is all about how data is handled from the moment it is created until it is no longer needed and is deleted or archived.
- Main Stages of the Data Life Cycle:



DEFINATION OF BUSINESS ANALYSTS

Business analysts assess an organization's current processes, systems, and products to identify areas for improvement, increase efficiency, and boost revenue.

Key responsibilities

- **Analyzing business needs:** They research and identify the organization's functional and technical needs and requirements to solve problems or capitalize on opportunities.
- **Data analysis:** They analyze large datasets using tools like SQL and Excel to find trends, create reports, and build financial models to support decision-making.

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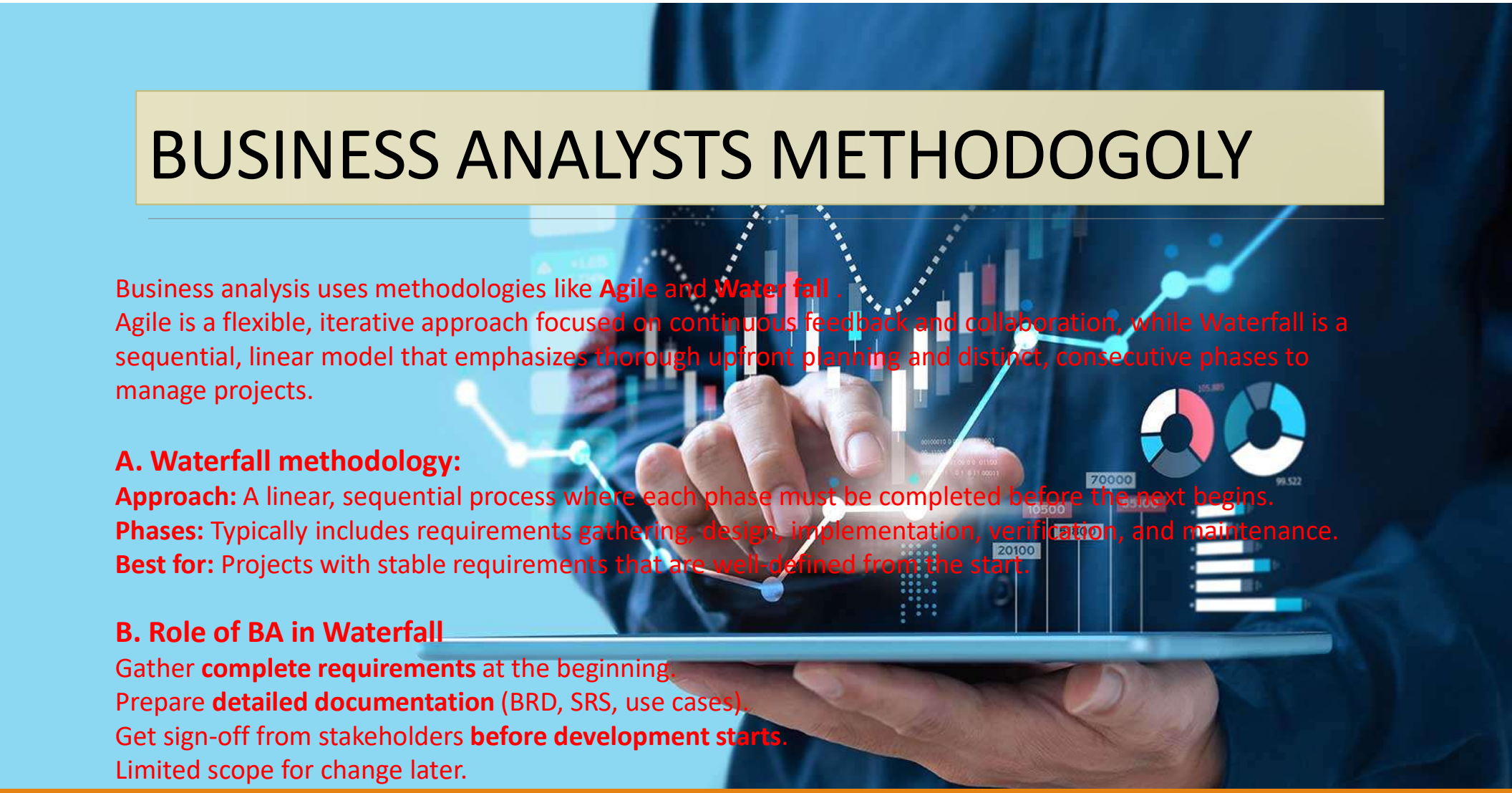
- **Process improvement:** They evaluate existing processes, identify inefficiencies, and propose solutions, which can include recommending new technology, policies, or system changes.
- **Requirements gathering:** They collect detailed requirements from stakeholders and use them to define the scope of projects.
- **Communication and documentation:** They create reports and presentations to communicate their findings to senior management and other stakeholders.
- **Solution implementation:** They may help oversee the implementation of new systems or processes and ensure they meet the defined requirements and provide value to the business.

BUSINESS ANALYSTS METHODOGOLY



Business analysis uses methodologies like **Agile** and **Water fall** .
Agile is a flexible, iterative approach focused on continuous feedback and collaboration, while Waterfall is a sequential, linear model that emphasizes thorough upfront planning and distinct, consecutive phases to manage projects.

A. Waterfall methodology:

Approach: A linear, sequential process where each phase must be completed before the next begins.
Phases: Typically includes requirements gathering, design, implementation, verification, and maintenance.
Best for: Projects with stable requirements that are well-defined from the start.

B. Role of BA in Waterfall

Gather **complete requirements** at the beginning.
Prepare **detailed documentation** (BRD, SRS, use cases).
Get sign-off from stakeholders **before development starts**.
Limited scope for change later.

Advantages

- Clear structure and planning.
- Good for **stable, well-understood requirements**.
- Strong documentation.

Disadvantages

- Not flexible to changes.
- Feedback comes **late**, after development.
- Risk of building something that doesn't match user needs if requirements change.

C. Agile methodology:

Approach: Iterative and incremental, focusing on flexibility, collaboration, and responding to change.
Key principles: Embraces feedback, breaks work into smaller pieces, and uses short, time-boxed cycles (sprints) to deliver value continuously.
Popular frameworks: Includes Scrum, Kanban, and Lean.
Best for: Projects where requirements may evolve or change, and where continuous feedback is valuable.

D. Role of BA in Agile:

- Work closely with **Product Owner and development team**.
- Help write and refine **user stories** with acceptance criteria.

- Participate in:
  - Sprint planning
  - Daily stand-up meetings
  - Sprint review
- Continuously **prioritize and clarify requirements**.
- Focus more on **communication and collaboration** than heavy documentation**.**

Advantages

- Very **flexible** with changing requirements.
- Regular **feedback** from users.
- Delivers working software **faster and more frequently**.

Disadvantages

- Needs high **team involvement** and collaboration.
- Documentation may be lighter.
- Difficult if stakeholders are not available regularly.

STAKEHOLDER MANAGEMENT

Stakeholder management is the process of identifying, analyzing, and engaging with individuals, groups, or organizations that can affect or are affected by a project or business. Its goal is to manage stakeholders' interests and expectations to ensure the initiative's success by building positive relationships and trust. This involves communication, understanding their needs, and managing expectations to achieve the project's objectives.

Key Points

- Stakeholders can **influence decisions**
- They can be **internal or external**
- Their needs and expectations are important

Examples of Benefits

- Saving time
- Reducing cost
- Improving quality
- Increasing profit
- Better customer satisfaction

DATA GOVERNANCE

Data governance is the set of **policies, rules, roles, and processes** that an organization uses to ensure its data is **correct, secure, consistent, and used responsibly**

Key Components

- **Policies & Standards** – rules for data usage
- **Roles & Responsibilities** – data owner, data steward
- **Data Quality Management**
- **Data Security & Access Control**

Benefits

- Improved data reliability
- Reduced data risks & errors
- Better business insights
- Increased trust in data

Example

- Ensuring customer data is **correct, secure, and used only by authorized users**

RAW DATA VS PROCESSED INFORMATION

Raw Data:

Definition

Raw data is **original, unorganized data** that is collected directly from a source and **has not been analyzed or processed**.

Key Points

- Unprocessed
- May contain errors or duplicates
- Not useful directly for decision-making

Examples

- Student marks before calculation
- Survey responses as collected
- Temperature readings from a sensor

Processed Data:

Definition

Processed data is data that has been **cleaned, organized, and analyzed** to make it **meaningful and useful**.

Key Points

- Structured and refined
- Easy to understand
- Useful for analysis and decisions

Examples

- Average marks of students
- Sales report
- Monthly temperature summary

ETHICAL USE OF DATA

Ethical use of data means **collecting, storing, sharing, and using data in a fair, legal, and responsible way**, while **respecting privacy, consent, and rights of individuals**.

Principles of Ethical Data Use:

1. Privacy
2. Consent
3. Transparency
4. Security
5. Fairness

Benefits of Ethical Data Use

- Builds trust with users
- Avoids legal problems
- Improves organization reputation

Examples

- Using customer data only for service improvement
- Not selling user data without permission
- Protecting student records in a database

DIFFERNCE BETWEEN CCPA vs GDPR compliance

Key Differences :

CCPA

- Focuses on **selling and sharing of personal data**
- Consumers can **opt out** of data sale
- Applies mainly to **large businesses**

GDPR

- Focuses on **full data protection**
- Requires **explicit user consent**
- Applies to **any organization handling EU data**

Example

- A company collecting EU customer data must follow **GDPR**
- A company collecting California customer data must follow **CCPA**

THANK YOU