

# MIS Question Bank with Solution

## 1. Define Management Information System (MIS) and state its capabilities. – 5M / 2M

=> A **Management Information System (MIS)** is a structured, computer-based system that gathers data from different sources, processes it into meaningful information, and distributes it to managers at various levels for effective planning, monitoring, and decision-making.

### Capabilities of MIS:

- a. **Data Collection & Storage** – Captures data from internal and external sources.
- b. **Processing of Data** – Converts raw data into useful information.
- c. **Decision Support** – Provides timely reports and summaries to aid decision-making.
- d. **Communication & Coordination** – Enhances flow of information across departments.
- e. **Forecasting & Planning** – Supports future strategies through trend analysis.

## 2. What is meant by the CIA triangle?

- The CIA Triangle (or CIA Triad) is a foundational model in information security, focusing on three essential objectives:
  1. **Confidentiality** – Protecting information from unauthorized access and disclosure. Example: Using encryption for sensitive emails.
  2. **Integrity** – Maintaining accuracy and consistency of data; preventing unauthorized modifications. Example: Checksums and digital signatures.
  3. **Availability** – Ensuring that systems, applications, and data are accessible to authorized users when required. Example: Backup systems and disaster recovery plans.

## 3. Discuss ethical issues mentioned by Mason (1986).

=>In 1986, Richard Mason highlighted four critical ethical issues of the information age, often remembered as **PAPA**:

1. **Privacy** – Concerns about how personal information is collected, stored, and used. Example: misuse of customer data without consent.

2. **Accuracy** – Ensuring information is correct and reliable, as wrong data can cause serious harm. Example: incorrect medical records.
3. **Property** – Ownership rights of data, software, and intellectual property. Example: software piracy or stealing digital content.
4. **Accessibility** – Deciding who should have access to certain types of information and ensuring equal digital opportunities. Example: digital divide.

#### 4. Define privacy & security.

##### =>Privacy:

Privacy refers to an individual's right to decide when, how, and to what extent personal data is shared with others. It involves safeguarding personal information such as financial details, health records, and browsing history from misuse or unauthorized disclosure.

*Example:* Social media platforms must protect user data from being sold without consent.

##### Security:

Security is the process of protecting information systems, networks, and data against unauthorized access, cyberattacks, theft, or damage. It ensures confidentiality, integrity, and availability (CIA) of information.

*Example:* Using firewalls, encryption, and authentication systems to protect organizational databases.

#### 5. What is data, information, knowledge? Explain with example. – 5M

=>**Data, Information, and Knowledge** are three levels in the hierarchy of understanding:

1. **Data** – Raw facts, numbers, or symbols that have no meaning by themselves.  
*Example:* "100, 95, 88" are just exam scores (raw values).
2. **Information** – Data that has been organized or processed to add meaning.  
*Example:* "Student A scored 100, Student B scored 95, Student C scored 88" – now the scores are linked to students.
3. **Knowledge** – Insights and understanding gained from information, used to make decisions.  
*Example:* A teacher observes that students scoring above 90 are consistently attentive in class, and uses this knowledge to design better teaching strategies.  
(In short: Data → processed into → Information → applied as → Knowledge)
6. **List and define the various unintentional threats to the Information System. – 5M**

=> **Unintentional threats** to Information Systems occur without malicious intent but can still cause damage, data loss, or system failure. Major types are:

1. **Human Errors** – Mistakes by employees such as entering wrong data, deleting files, or misconfiguring systems.

2. **Carelessness/Lack of Awareness** – Weak passwords, leaving systems unattended, or falling for phishing attempts.
  3. **Environmental Hazards** – Natural disasters like floods, fire, earthquakes that damage IT infrastructure.
  4. **Hardware/Software Failures** – System crashes, hard disk failures, or bugs leading to downtime or data loss.
  5. **Poor System Design or Maintenance** – Weak security settings, outdated software, or improper updates that expose vulnerabilities.
- These threats are **not deliberate**, but they still highlight the need for **training, backup systems, and preventive measures**.

7. **Differentiate between Data Mart (DM), Data Warehouse (DW) & Data Lakes.** – 10M

Aspect	Data Mart (DM)	Data Warehouse (DW)	Data Lake
<b>Definition</b>	Subset of a data warehouse, focused on a single subject area (e.g., marketing, HR).	Centralized, integrated, structured repository of organizational data.	Large storage repository that holds raw data in original format.
<b>Data Type</b>	Structured	Structured (organized, historical)	Structured, semi-structured, unstructured (logs, images, videos, IoT data).
<b>Purpose</b>	Department-level analysis	Enterprise-wide decision support & reporting	Big data analytics, AI, ML, real-time processing
<b>Scope</b>	Narrow (specific function)	Broad (organization-wide)	Very broad (all types of data, any source)

<b>Data Processing</b>	Pre-processed, ready for reporting	ETL (Extract–Transform–Load) applied before storage	ELT (Extract–Load–Transform), processing happens after storage
<b>Users</b>	Middle managers, specific business units	Executives, analysts, organization-wide	Data scientists, analysts, big data engineers
<b>Example</b>	Sales team analyzing monthly sales trends	Company-wide financial performance reporting	Social media platform storing clicks, posts, videos, logs

#### 8. Justify the use of DBMS approach in Information Systems.

=> The **DBMS approach** is justified in Information Systems because it overcomes the limitations of traditional file-based systems and offers several advantages:

1. **Data Integration & Centralization** – Provides a single repository for organizational data accessible across departments.
2. **Reduced Data Redundancy** – Prevents duplication by storing data once and sharing it across applications.
3. **Data Consistency & Accuracy** – Ensures uniform updates so all users see the same, correct information.
4. **Improved Data Security** – Provides authentication, authorization, and access control to protect sensitive data.
5. **Backup & Recovery** – Ensures data is safe and can be restored after hardware/software failures.
6. **Multi-user Support** – Allows concurrent access to data without conflicts.
7. **Better Decision-Making** – Provides reliable and up-to-date information for managers.
- **Conclusion:** The DBMS approach enhances **efficiency, reliability, and security**, making it essential for modern Information Systems.
9. **Explain big data processing by use of HDFS.** – 5M

=> The **Hadoop Distributed File System (HDFS)** is designed to handle massive volumes of structured and unstructured data. It works on the principle of **distributed storage and parallel processing**.

#### **Key Features & Working:**

1. **Data Splitting** – Large datasets are divided into fixed-size blocks (e.g., 128 MB).
2. **Distributed Storage** – Blocks are stored across different nodes (servers) in the Hadoop cluster.
3. **Replication** – Each block is replicated (default 3 copies) to ensure fault tolerance and high availability.
4. **NameNode & DataNode Architecture** –
  - **NameNode:** Manages metadata (file names, locations).
  - **DataNodes:** Store actual blocks of data.
5. **Parallel Processing** – MapReduce or other big data engines process the blocks simultaneously on different nodes, speeding up analysis.
6. **Fault Tolerance** – If one DataNode fails, data is retrieved from its replica automatically.
- **Example:** If an e-commerce company stores clickstream data (TBs daily), HDFS distributes it across servers, and analytics can run in parallel to generate customer insights.
- **Conclusion:** HDFS enables **scalable, reliable, and efficient big data processing**, making it the backbone of the Hadoop ecosystem.

#### **10. Which are the different career opportunities in MIS? – 5M**

=> Management Information Systems (MIS) professionals work at the intersection of business and technology. Some key career paths are:

- a. **Systems Analyst** – Analyzes business needs and designs IT solutions.
- a. **Database Administrator (DBA)** – Manages, secures, and optimizes databases.
- b. **IT Manager / MIS Manager** – Oversees information systems, ensures alignment with business goals.
- c. **Business Analyst** – Uses MIS reports to analyze trends and support decision-making.
- d. **Data Analyst / Data Scientist** – Extracts insights from large datasets for strategic planning.
- e. **Network Administrator** – Maintains communication networks and system connectivity.
- f. **ERP Specialist** – Manages enterprise resource planning systems for business integration.
- g. **Information Security Analyst** – Protects systems and data from cyber threats.
- MIS careers offer opportunities in **business consulting, IT management, analytics, and cybersecurity** across all industries.

## 11. Why is it important to study MIS? – 2M

=> **Importance of Studying MIS:**

1. **Improves Decision-Making** – Provides managers with accurate and timely information.
2. **Enhances Efficiency** – Automates business processes, reducing time and cost.
3. **Competitive Advantage** – Helps organizations use IT to outperform competitors.
4. **Bridges Business & Technology** – MIS professionals connect technical systems with business goals.
5. **Career Opportunities** – Opens roles in IT management, data analysis, and business consulting.
6. **Problem-Solving** – Supports managers in identifying trends, risks, and opportunities.
7. **Adaptation to Digital Era** – Prepares organizations to handle big data, AI, and e-business.
- In short, MIS equips individuals with knowledge to **leverage IT for business success** and is essential for modern management.

## 12. Short note on Glocalization. What are the 10 flatteners & what do they signify? – 10M

=> **Definition:** Glocalization is the adaptation of global products, services, or strategies to fit local cultures, preferences, and markets while maintaining a global presence.

- **Example:** McDonald's offering McAloo Tikki in India or Teriyaki Burgers in Japan.
- **Significance:** It allows global companies to expand worldwide while respecting local needs, building customer acceptance, and sustaining competitiveness.
- Friedman identified **10 factors ("flatteners")** that leveled the global competitive playing field by enabling worldwide collaboration and competition:
  1. **Fall of the Berlin Wall (1989)** – Symbolized opening of markets and end of Cold War barriers.
  2. **Netscape IPO (1995)** – Popularized the internet and web browsing for global connectivity.
  3. **Workflow Software** – Allowed seamless collaboration (emails, shared documents, etc.).
  4. **Open-Sourcing** – Community-driven development of software/tools (e.g., Linux, Wikipedia).
  5. **Outsourcing** – Companies sending specific tasks (e.g., customer support, IT services) overseas.
  6. **Offshoring** – Shifting entire production units to other countries (e.g., factories in China).
  7. **Supply-Chaining** – Streamlined global supply networks (e.g., Walmart, Amazon logistics).

8. **Insourcing** – Specialized companies managing operations for others (e.g., UPS handling repairs for Toshiba).
9. **In-forming** – Individuals accessing vast information independently via Google, Yahoo, etc.
10. **The Steroids** – Digital technologies (wireless, VoIP, mobile, cloud, social media) that accelerate all other flatteners.

### 13. Explain competitive advantage with case study. – 5M

=> Competitive advantage is the ability of an organization to create or deliver **better value** to customers than its competitors, leading to superior performance, higher market share, or profitability.

It can be achieved through:

- **Cost Leadership** (offering products at lower cost),
- **Differentiation** (unique products/services), or
- **Focus Strategy** (targeting niche markets).

#### Case Study Example: Amazon

- **Strategy Used:** Combination of **cost leadership** and **differentiation**.
- **How:**
  1. Uses advanced **MIS and big data analytics** to recommend products, personalize customer experience.
  2. Efficient **supply chain and logistics** (e.g., same-day delivery, automation with robots in warehouses).
  3. **Cloud computing (AWS)** – diversified business model providing infrastructure to other companies.
- **Result:** Amazon achieved competitive advantage by lowering costs, increasing convenience, and differentiating through technology-driven services.
- **Conclusion**
  - MIS and IT play a crucial role in achieving competitive advantage by:
    - Optimizing operations,
    - Improving decision-making, and
    - Creating unique customer experiences.

### 14. Explain organizational strategy with examples. – 10M

=> Organizational strategy is the long-term plan that defines how a company uses its resources, processes, and technologies to achieve business goals and gain a competitive edge. It aligns **business objectives** with **operational activities** and **IT support**.

- **Types of Organizational Strategies with Examples**

1. **Cost Leadership Strategy**

- Focus: Offer products/services at the lowest possible cost.
- Example: **Walmart** uses efficient supply chain and MIS to minimize costs and provide “Everyday Low Prices.”

2. **Differentiation Strategy**

- Focus: Provide unique products/services that stand out in the market.
- Example: **Apple** differentiates with innovative design, iOS ecosystem, and customer experience.

3. **Focus/Niche Strategy**

- Focus: Target a specific market segment or niche.
- Example: **Rolls-Royce** focuses on luxury automobiles for a high-income customer base.

4. **Innovation Strategy**

- Focus: Continuous innovation in products, services, or business models.
- Example: **Tesla** innovates in electric vehicles and autonomous driving technology.

5. **Growth Strategy**

- Focus: Expanding into new markets or launching new products.
- Example: **Starbucks** expanded globally while adapting menus to local tastes (glocalization).

6. **Alliance/Collaboration Strategy**

- Focus: Forming partnerships to strengthen capabilities.
- Example: **Spotify + Facebook** integration allowed music sharing and increased reach.

- **Conclusion:** Organizational strategy ensures that a company’s resources, processes, and technologies are used effectively to achieve long-term success. MIS plays a vital role by providing data, analysis, and decision support for implementing these strategies.

15. **With neat diagram explain Data Governance. Why is it required? – 10M**

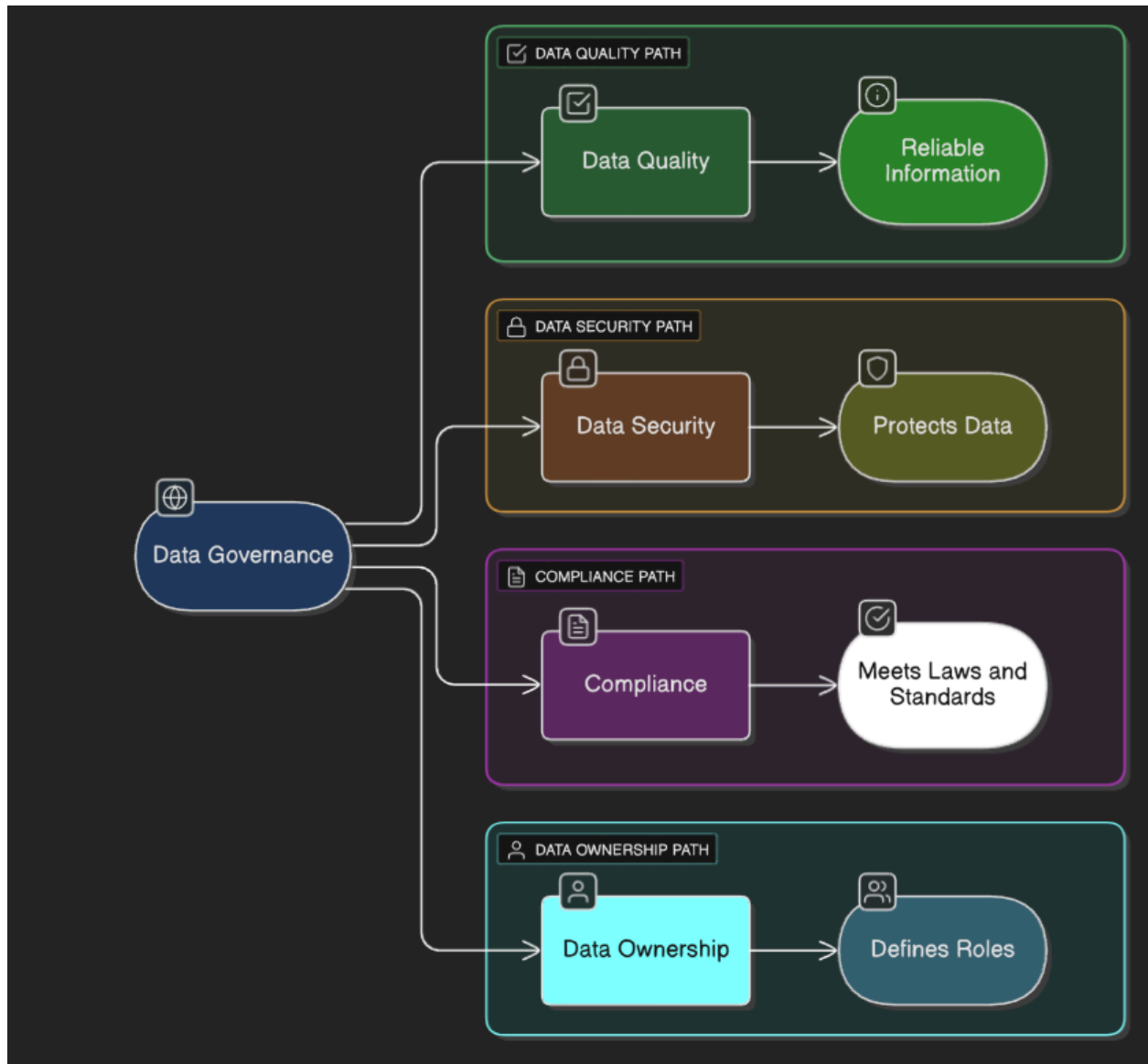
**Definition of Data Governance:** Data Governance is a framework of **policies, processes, standards, and responsibilities** that ensures an organization’s data is accurate, consistent, secure, and used properly. It defines **who can take what actions, with what data, and under what conditions**.

- **Why Data Governance is Required**

1. **Data Quality** – Ensures accuracy, consistency, and reliability of organizational data.
2. **Compliance** – Meets legal and regulatory requirements (e.g., GDPR, HIPAA).



3. **Security & Privacy** – Protects sensitive data from unauthorized access or misuse.
4. **Decision-Making** – Provides trusted data for business intelligence and analytics.
5. **Accountability** – Assigns clear roles and responsibilities for data ownership.
6. **Operational Efficiency** – Reduces duplication and improves data management across departments.



## 16. Compare BI & Business Analytics with case study/examples.

=> Business Intelligence (BI): Focuses on descriptive analytics – collecting, processing, and reporting historical and current data to support business decisions.

- **Business Analytics (BA):** Goes beyond BI by using predictive and prescriptive analytics – applying statistical models, machine learning, and simulations to forecast future outcomes and recommend actions.

Aspect	Business Intelligence (BI)	Business Analytics (BA)
Focus	What happened? (Past & present)	Why did it happen & what will happen? (Future)
Type of Analytics	Descriptive & Diagnostic	Predictive & Prescriptive
Data	Historical, structured	Historical + real-time, structured + unstructured
Tools	Dashboards, reports, OLAP, data warehouses (e.g., Power BI, Tableau)	Data mining, machine learning, statistical modeling (e.g., R, Python, SAS)
Users	Managers, executives	Data scientists, analysts, strategists
Outcome	Informed decisions from reports	Forecasts, scenarios, recommendations

- Case Study Example
- Retail Company Example (e.g., Walmart or Amazon):
  - **BI Usage:** The company uses BI dashboards to see past sales trends, seasonal demand, and inventory levels. Example: Reports showing last year's Diwali sales by region.

- **BA Usage:** The company applies predictive analytics to forecast future demand, personalize promotions, and optimize stock. Example: Amazon recommends products to users by analyzing browsing + purchase history using ML models.

- Conclusion:

- BI = “Looking in the rear-view mirror” → Helps understand what happened.
- BA = “Looking through the windshield” → Helps predict and decide what to do next.
- Together, BI and BA give a complete decision-support system for modern organizations.

## 17. Discuss various types of business pressures. – 2M / 5M

=> Organizations face several **business pressures** that drive them to adopt **Information Systems (IS)** and **innovative strategies**:

### 1. Market Pressures

- **Globalization** – Competing with global firms.
- **Changing workforce** – Remote work, diverse talent.
- **Powerful customers** – Higher expectations, demand for personalization.  
*Example:* E-commerce giants forcing traditional retailers to adopt online strategies.

### 2. Technology Pressures

- **Information Overload** – Handling huge amounts of data (big data).
- **Rapid IT Innovations** – Need to keep up with AI, IoT, blockchain, cloud.
- **Obsolescence** – Fast-changing tech makes existing systems outdated.  
*Example:* Nokia lost market share due to slow adaptation to smartphones.

### 3. Societal, Political, and Legal Pressures

- **Social Responsibility** – Sustainability, green IT, ethical sourcing.
- **Government Regulations** – GDPR, HIPAA, taxation policies.
- **Terrorist Attacks/Natural Disasters** – Affect global supply chains.  
*Example:* Companies adapting to GDPR for data privacy compliance in Europe.

18. Differentiate between Data Warehouse and Data Mart.

Aspect	Data Warehouse (DW)	Data Mart (DM)
Scope	Enterprise-wide	Department-specific (e.g., sales, HR)
Data	Integrated from multiple sources	Subset of warehouse or specific sources
Size	Very large (terabytes to petabytes)	Smaller (gigabytes to terabytes)
Users	Top management, analysts	Middle managers, departmental staff
Purpose	Organization-wide strategic decision support	Tactical/operational decision-making
Cost & Complexity	High cost, complex to implement	Lower cost, faster to implement

**19. Explain the three processes utilized during risk management. – 5M**

=> **Risk Management** is the process of identifying, assessing, and controlling threats to an organization's information systems. The three key processes are:

**1. Risk Identification**

- Detecting potential risks that could affect information systems or business operations.
- Includes internal risks (human errors, system failures) and external risks (natural disasters, cyberattacks).
- *Example:* Identifying the risk of phishing attacks on employees.

**2. Risk Assessment / Analysis**

- Evaluating the **likelihood** of each risk and its **potential impact** on the organization.
- Helps prioritize which risks need immediate attention.
- *Example:* A ransomware attack could halt operations and cause financial loss; high priority.

**3. Risk Mitigation / Control**

- Implementing measures to **reduce, avoid, or transfer risk**.
- Strategies include preventive controls (firewalls, access restrictions), corrective measures (backup, disaster recovery), and risk transfer (insurance).
- *Example:* Installing anti-malware software, regular backups, and employee training programs.

**20. Explain TPS (Transaction Processing System) in detail. – 2M / 5M**

=> A **Transaction Processing System (TPS)** is a computerized system that handles **routine, recurring transactions** in real-time or batch mode. It ensures **accuracy, reliability, and speed** in processing large volumes of data.

**Characteristics of TPS:**

1. **Reliability & Accuracy** – Ensures transactions are processed correctly.
2. **High Volume & Speed** – Can handle thousands or millions of transactions daily.
3. **Atomicity** – Each transaction is fully completed or not executed at all.
4. **Security** – Protects sensitive transactional data.
5. **Real-time or Batch Processing** –

- **Real-time TPS:** Processes transactions immediately (e.g., ATMs).
- **Batch TPS:** Processes accumulated transactions at scheduled intervals (e.g., payroll processing).

### Functions of TPS:

- Data collection and input
- Transaction processing (adding, updating, deleting records)
- Storing results in databases
- Generating receipts, invoices, reports

### Examples:

- **Banking:** ATMs, fund transfers, deposit/withdrawal.
- **Retail:** POS (Point of Sale) systems processing sales.
- **Airlines:** Ticket reservation systems.

### Importance:

- Supports **day-to-day operations**.
- Provides **accurate, up-to-date data** for management information systems (MIS).
- Reduces **manual errors** and speeds up operations.

### 21. With neat diagram explain how Information Technology is incorporated in any organization. – 5M

=> Information Technology (IT) is incorporated into organizations to **improve efficiency, communication, decision-making, and competitiveness**. IT systems support various functional areas such as operations, finance, marketing, HR, and supply chain.

#### - How IT is Incorporated

1. **Operational Level (TPS):** IT automates day-to-day operations through **Transaction Processing Systems** (e.g., POS, payroll, inventory).
2. **Management Level (MIS):** IT supports **middle management** in monitoring and controlling operations through **Management Information Systems (MIS)**.
3. **Strategic Level (DSS / BI / BA):** IT aids **top management** in planning and decision-making using **Decision Support Systems, Business Intelligence, and Analytics**.
4. **Communication & Collaboration:** IT enables **internal and external communication** via emails, intranets, video conferencing, and collaborative tools.
5. **Data Management & Security:** IT manages **data storage, retrieval, security, and governance** to ensure reliable and protected information.

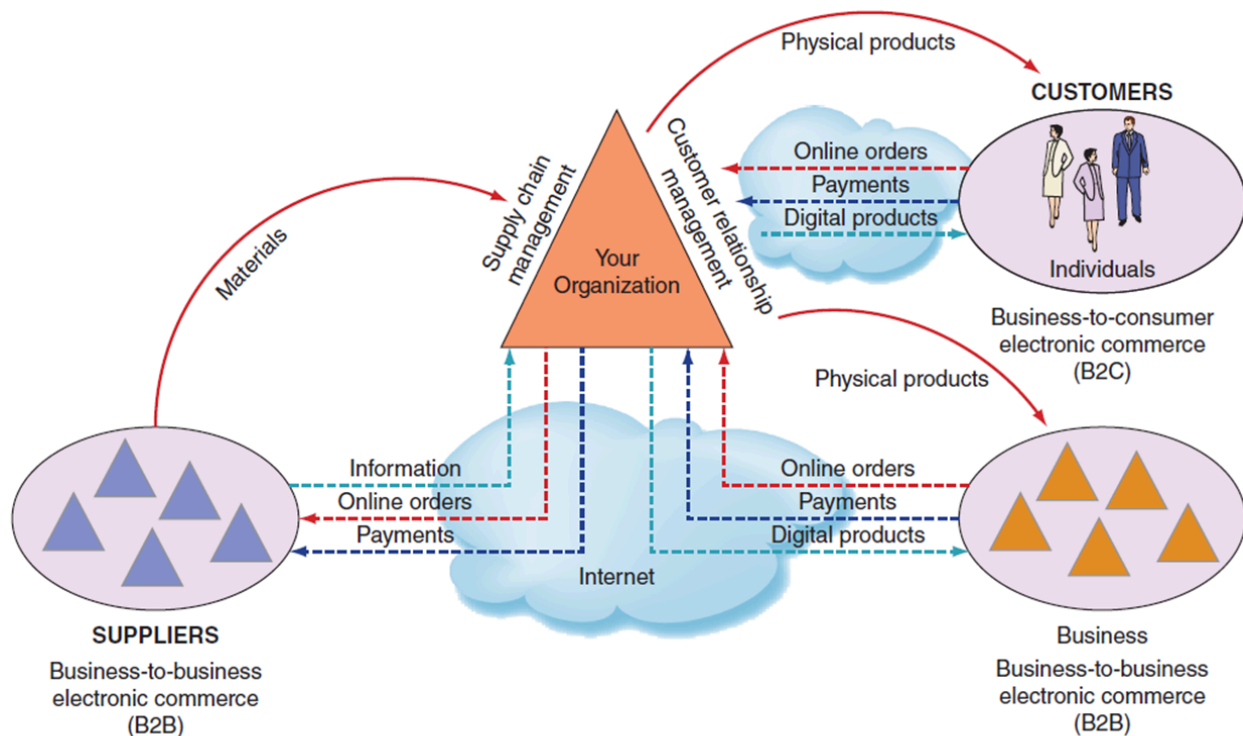


Figure 1.5 Information systems that function among multiple organizations.

## 22. Explain the process and phases in decision making. – 5M

### Decision-Making Process:

Decision-making is a structured process used by managers to **select the most appropriate course of action**. It involves several phases:

1. **Problem Identification:** Recognize and define the issue that requires a decision.  
Example: Declining sales in a product line.
2. **Gathering Information / Data:** Collect relevant data from internal and external sources.  
Example: Market research, customer feedback, sales reports.
3. **Generating Alternatives:** Identify possible solutions or courses of action. Example: Launch a new marketing campaign, redesign the product, reduce price.
4. **Evaluating Alternatives:** Analyze each alternative for feasibility, cost, risk, and potential benefits. Example: Cost-benefit analysis, SWOT analysis.
5. **Choosing the Best Alternative:** Select the option that best addresses the problem while aligning with organizational goals.
6. **Implementation of the Decision:** Put the chosen alternative into action. Example: Roll out a new marketing campaign across regions.
7. **Monitoring and Reviewing:** Evaluate the outcomes and effectiveness of the decision. Make adjustments if necessary.

### 23. Elaborate the fundamental tenets of ethics. – 5M

=> Ethics refers to the **principles of right and wrong** that guide individual and organizational behavior. The fundamental tenets of ethics provide a framework for **responsible decision-making** in personal and professional contexts.

#### 1. **Honesty**

- Being truthful in actions, communications, and reporting.
- Example: Accurately reporting financial data instead of manipulating numbers.

#### 2. **Integrity**

- Acting consistently with moral and professional principles.
- Example: Refusing to participate in fraudulent activities even under pressure.

#### 3. **Fairness / Justice**

- Treating people equitably and making impartial decisions.
- Example: Ensuring promotions or rewards are based on merit, not favoritism.

#### 4. **Accountability**

- Accepting responsibility for one's actions and decisions.
- Example: Owning up to mistakes rather than blaming others.

#### 5. **Respect for Others**

- Valuing individual rights, privacy, and dignity.
- Example: Protecting employee or customer data from misuse.

#### 6. **Transparency**

- Being open and clear about actions, decisions, and policies.
- Example: Sharing organizational policies on data use or performance evaluation.

#### 7. **Lawfulness / Compliance**

- Adhering to legal, regulatory, and organizational rules.
- Example: Following copyright laws and data protection regulations.

#### 8. **Empathy / Social Responsibility**

- Considering the impact of decisions on society and stakeholders.
- Example: Using environmentally sustainable business practices.

**Conclusion:** These tenets guide ethical behavior in **personal life, business, and information systems**, ensuring trust, fairness, and accountability. Organizations often formalize these principles in **codes of conduct** and **ethics policies**.



## 24. Differentiate between threat, exposure and vulnerability in terms of security concerns. – 10M

### 1. Threat

- A **threat** is any potential event, action, or circumstance that can cause damage or adverse effects to an information system, network, or organization. Threats can be **intentional**, such as hacking, phishing, or malware attacks, or **accidental**, such as natural disasters, human errors, or system failures. Threats represent the *possibility* of harm, but not necessarily the certainty of it. Identifying threats is crucial for risk assessment, as it helps organizations prepare and implement safeguards.
- *Example:* A hacker trying to gain unauthorized access to a company's database is a threat. Similarly, a fire in the data center is also considered a threat.

### 2. Exposure

- **Exposure** refers to the extent to which a system, asset, or network is open or susceptible to potential threats. It represents the system's **visibility and accessibility** to risk. High exposure increases the likelihood of threats successfully targeting the system. Exposure is influenced by network configurations, open ports, weak access controls, and publicly available sensitive information.
- *Example:* A web server directly accessible from the internet with weak authentication is highly exposed. On the other hand, a server behind a firewall with strict access rules has low exposure.

### 3. Vulnerability

- A **vulnerability** is a weakness, flaw, or gap in a system, process, or control that can be exploited by a threat to cause harm. Vulnerabilities can be **technical** (e.g., unpatched software, weak encryption), **procedural** (e.g., inadequate security policies), or **physical** (e.g., unlocked server rooms). While exposure shows openness to threats, vulnerabilities indicate *actual weaknesses* that threats can exploit.
- *Example:* Using outdated software with known security flaws or storing passwords in plain text are vulnerabilities.

## 25. Specify the various deliberate threats to information systems. – 10M

=> Deliberate threats are intentional actions aimed at damaging, disrupting, or gaining unauthorized access to information systems. These threats are carried out by individuals or groups with malicious intent. Common types include:

### 1. Hacking / Unauthorized Access

- Gaining access to systems or networks without permission.
- Methods include password cracking, exploiting software vulnerabilities, and bypassing authentication.
- *Example:* A hacker breaking into a company's database to steal sensitive data.

### 2. Viruses and Malware

- Malicious software designed to damage, disrupt, or gain control of systems.
- Includes viruses, worms, ransomware, spyware, and trojans.
- *Example:* A ransomware encrypting files and demanding payment for decryption.

### 3. Phishing and Social Engineering

- Manipulating users to disclose confidential information, such as passwords or bank details.
- Techniques include fake emails, phone calls, or fraudulent websites.
- *Example:* An attacker posing as IT support to trick employees into revealing login credentials.

### 4. Denial of Service (DoS) / Distributed DoS (DDoS) Attacks

- Overwhelming systems or networks with traffic to make them unavailable to legitimate users.
- *Example:* Flooding a website with requests to crash it.

### 5. Insider Threats

- Malicious actions carried out by employees, contractors, or business partners.
- Can involve stealing sensitive data, sabotaging systems, or bypassing security policies.
- *Example:* A disgruntled employee deleting critical files.

### 6. Data Theft / Espionage

- Stealing sensitive or confidential information for personal gain, industrial advantage, or political motives.
- *Example:* Exfiltrating trade secrets or financial data from a company's servers.

### 7. Tampering and Sabotage

- Deliberate alteration, destruction, or disruption of systems, programs, or data.
- *Example:* Modifying software to introduce backdoors or corrupting database entries.

### 8. Man-in-the-Middle (MitM) Attacks

- Intercepting and possibly altering communication between two parties without their knowledge.
- *Example:* Capturing login credentials over unsecured Wi-Fi networks.

26. List the different types of Computer Based Information Systems (CBIS) and explain any one of them. – 10M

CBIS Type	Explanation	Example
<b>Transaction Processing System (TPS)</b>	Automates routine, day-to-day business transactions.	Point-of-Sale system recording retail sales.
<b>Management Information System (MIS)</b>	Provides summarized reports from TPS data to support management decisions.	Sales MIS generating monthly sales reports.
<b>Decision Support System (DSS)</b>	Helps managers make decisions by analyzing data and providing simulations or models.	A system predicting stock market trends.
<b>Knowledge Management System (KMS)</b>	Stores and shares organizational knowledge for decision-making and learning.	Wiki or document repository used by employees.
<b>Expert System (ES)</b>	Mimics human expertise to solve specific problems using rules and logic.	Medical diagnosis system recommending treatments.
<b>Office Automation System (OAS)</b>	Supports office tasks like communication, document management, and scheduling.	MS Office suite or Google Workspace tools.

<b>Executive Information System (EIS)</b>	Provides top executives with easy access to key performance indicators and trends.	Dashboard showing company KPIs for the CEO.
<b>Enterprise System / ERP</b>	Integrates all departments and functions across an organization into a unified system.	SAP ERP managing finance, HR, and supply chain.

## 27. Write short note on phases of Decision Making process. – 5M / 10M

=> Decision-making is a systematic process used by managers and individuals to choose the best course of action. The **phases** are:

1. **Intelligence Phase (Problem Identification)**
  - Identify and define the problem or opportunity.
  - *Example:* Noticing a decline in monthly sales.
2. **Design Phase (Solution Development)**
  - Develop possible alternatives or solutions to the problem.
  - *Example:* Considering options like new marketing campaigns or discounts.
3. **Choice Phase (Selecting a Solution)**
  - Evaluate alternatives and select the most suitable solution.
  - *Example:* Choosing the marketing campaign that promises highest ROI.
4. **Implementation Phase (Action)**
  - Execute the chosen solution.
  - *Example:* Launching the selected marketing campaign.
5. **Monitoring / Review Phase (Evaluation)**
  - Assess results to see if the problem is resolved or objectives met.
  - *Example:* Measuring sales growth after the campaign and adjusting strategy if needed.

## Scenario-Based Question

### Scenario:

A retail company uses data mining techniques to analyze customer purchase histories and predict future buying behavior. They then use this information to send targeted advertisements and promotions to customers. However, some customers feel uncomfortable with the extent to which the company knows their preferences and habits, leading to concerns about privacy and manipulation.

### Questions:

1. Ethical issues
2. Suggest suitable solutions by analyzing ethical framework
3. Explain with neat diagram Porter's Model for competitive advantage – 10M

### => 1. Ethical Issues

1. **Privacy Concerns:** Collecting and analyzing detailed personal data without explicit consent.
2. **Manipulation / Autonomy:** Using insights to influence customer behavior subtly may limit free choice.
3. **Data Security:** Risk of unauthorized access to sensitive customer information.
4. **Transparency & Consent:** Customers may not be fully aware of the extent of data collection or its use.

### 2. Suggested Solutions Using Ethical Frameworks

Ethical Framework	Application / Solution
<b>Utilitarianism (Consequences)</b>	Balance business benefits with customer well-being; ensure promotions are helpful, not manipulative.
<b>Deontological Ethics (Duty / Rules)</b>	Collect data only with informed consent; respect customer privacy as a moral duty.
<b>Virtue Ethics (Character / Integrity)</b>	Promote honesty, transparency, and fairness in data practices to build trust.

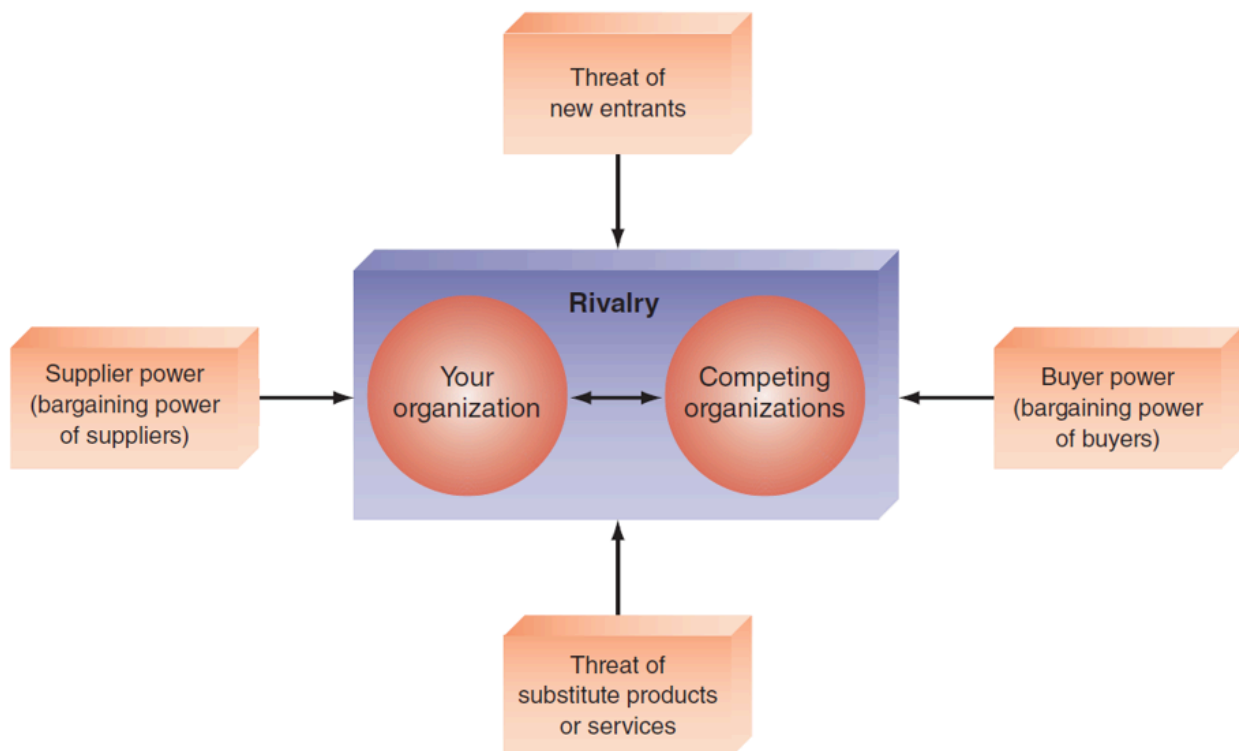
<b>Rights-Based Approach</b>	Protect customer rights to privacy and control over personal information.
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### Practical Solutions:

- Obtain explicit consent before data collection.
- Allow customers to opt out of targeted promotions.
- Use anonymized data for analysis whenever possible.
- Clearly communicate data usage policies to customers.

**3. Porter's Model for Competitive Advantage:** Michael Porter's model identifies **strategies to gain a competitive edge** in the market. The two main approaches are:

1. **Cost Leadership** – Becoming the lowest-cost producer in the industry.
  - Example: Walmart uses economies of scale to offer lower prices.
2. **Differentiation** – Offering unique products or services that customers value.
  - Example: Apple differentiates through design and user experience.
3. **Focus Strategy** – Targeting a specific market niche, either via:
  - **Cost Focus:** Low-cost strategy for a niche.
  - **Differentiation Focus:** Unique offering for a niche.



**Ac**

**28. Elaborate with neat diagram the business, organizational performance and how IT supports in handling these pressures. – 10M / 5M**

=> **1. Business Pressures:** Organizations face pressures from both **external** and **internal** environments:

- **External Pressures:**
  - **Market Competition:** Need to offer better products/services than competitors.
  - **Globalization:** Competing with international firms and managing global operations.
  - **Regulatory / Legal:** Compliance with laws, standards, and regulations.
  - **Technological Change:** Rapid adoption of new technologies by competitors.
- **Internal Pressures:**
  - **Operational Efficiency:** Reducing costs and improving productivity.
  - **Customer Expectations:** Demand for better quality, faster service, and personalization.
  - **Innovation Needs:** Developing new products, services, and processes.

**2. Organizational Performance:** Organizational performance depends on how effectively a company responds to these pressures. Key aspects include:

- **Efficiency:** Reducing costs, time, and resource utilization.
- **Effectiveness:** Achieving business goals and meeting customer expectations.
- **Flexibility:** Quickly adapting to changing market conditions.
- **Innovation:** Introducing new products, services, and processes.
- **Quality:** Maintaining high standards in products and services.

**3. Role of IT in Handling Pressures:** Information Technology (IT) supports organizational performance in several ways:

1. **Automation of Operations:**
  - Reduces human error and increases efficiency.
  - *Example:* ERP systems for inventory and supply chain management.
2. **Data-Driven Decision Making:**
  - Provides insights from business analytics and data mining.
  - *Example:* Predicting customer trends using CRM analytics.
3. **Communication & Collaboration:**
  - Facilitates coordination across departments and geographies.
  - *Example:* Cloud collaboration tools like Microsoft Teams or Slack.
4. **Innovation & Competitive Advantage:**
  - Supports development of new products, services, and business models.
  - *Example:* AI-powered personalization in e-commerce.
5. **Compliance & Risk Management:**
  - Helps monitor and ensure adherence to legal, regulatory, and security standards.

- *Example:* IT security systems protecting sensitive data.

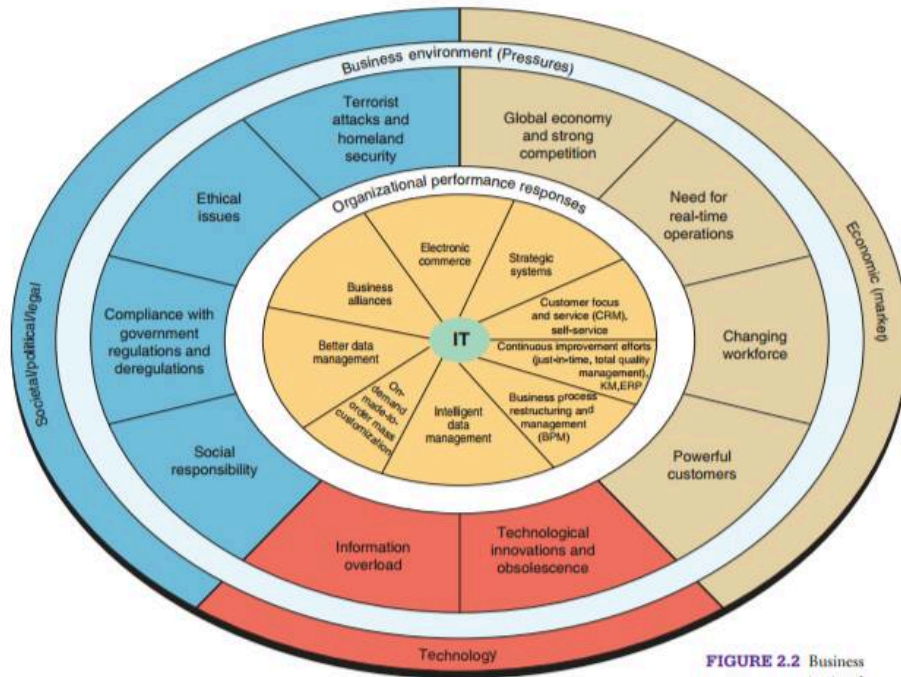


FIGURE 2.2 Business pressures, organizational

## 29. What is KMS? What are the different steps in the Knowledge Management Cycle?

– 5M

=> A **Knowledge Management System (KMS)** is a computer-based system that helps organizations **capture, store, organize, and share knowledge** to improve decision-making, efficiency, and innovation.

- Supports creation, retrieval, and dissemination of knowledge.
- Helps employees and managers access **explicit knowledge** (documents, reports) and **tacit knowledge** (experience, skills).
- Enhances organizational learning and competitive advantage.
- **Example:** Corporate wiki, SharePoint, or AI-powered knowledge base used by employees to find best practices or solutions.
- **Steps in the Knowledge Management (KM) Cycle**
- The KM Cycle represents the continuous process of **creating, sharing, and using knowledge** within an organization. The main steps are:
  1. **Knowledge Creation / Capture**
    - Generating new knowledge from experience, research, or external sources.
    - *Example:* Documenting a new product design process.
  2. **Knowledge Storage / Organization**
    - Storing knowledge in structured repositories for easy access.
    - *Example:* Saving research reports in a central database.



### 3. Knowledge Sharing / Dissemination

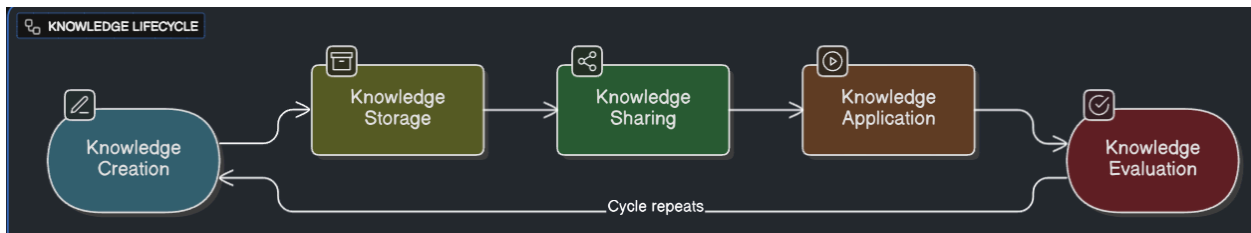
- Making knowledge available to relevant stakeholders.
- *Example:* Sharing best practices through internal portals or training sessions.

### 4. Knowledge Application / Use

- Applying stored knowledge to improve processes, decisions, or services.
- *Example:* Using previous project lessons to avoid errors in new projects.

### 5. Knowledge Evaluation / Feedback

- Assessing the effectiveness of knowledge and updating it as needed.
- *Example:* Reviewing customer support solutions to improve response quality.



### 30. Explain in detail the difference between BI & Business Analytics. – 10M

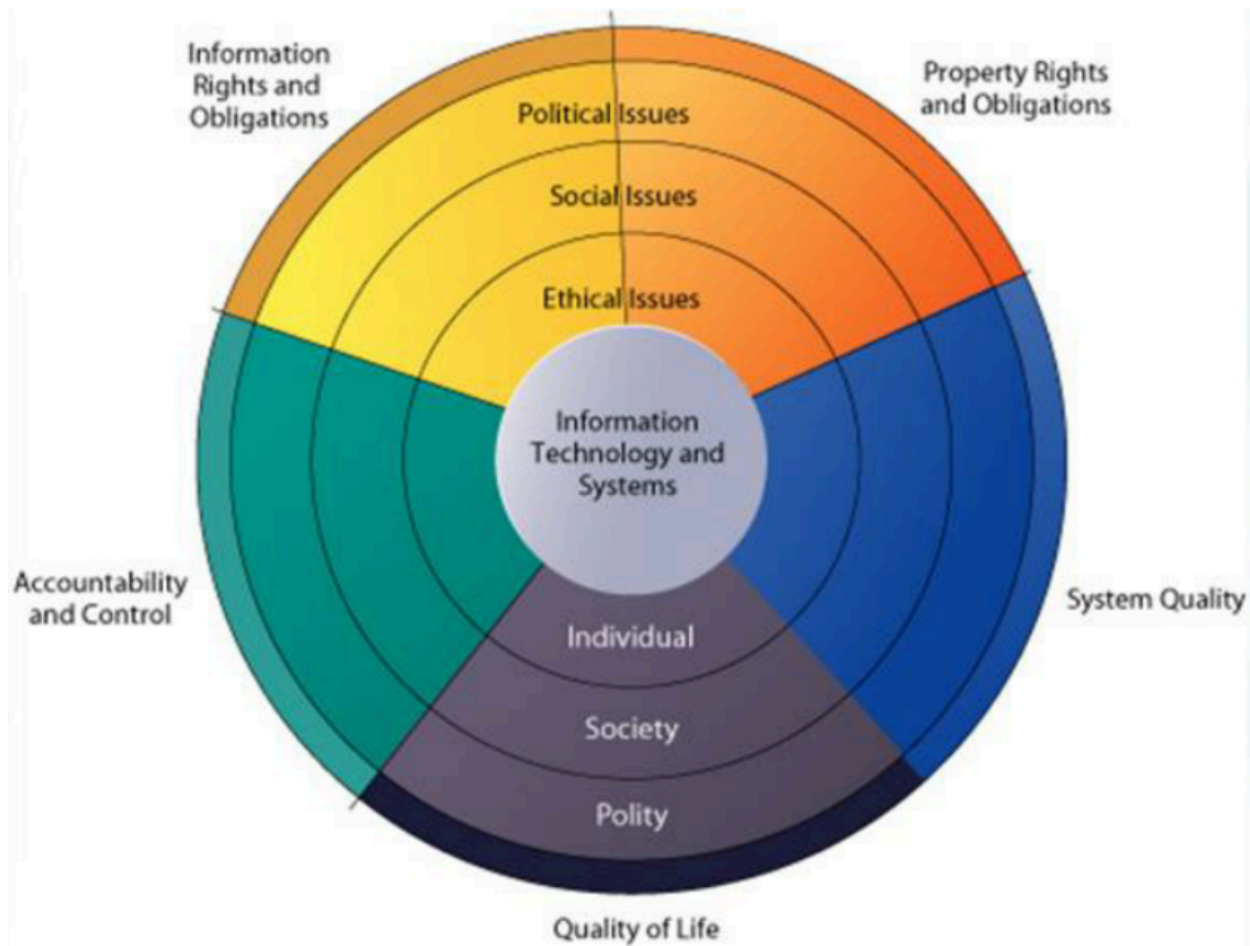
Feature	Business Intelligence (BI)	Business Analytics (BA)
Definition	Technologies and practices that collect, integrate, analyze, and present historical and current data to support decision-making.	Process of using statistical, quantitative, predictive, and prescriptive analysis to discover patterns, forecast trends, and make data-driven decisions.
Purpose / Focus	Reporting, monitoring, and descriptive analysis – understanding past and present.	Predictive and prescriptive analysis – understanding why and forecasting future outcomes.
Data Used	Primarily structured, historical data from databases and data warehouses.	Both structured and unstructured data, including historical, real-time, and external sources.

<b>Techniques / Tools</b>	Dashboards, scorecards, OLAP, reporting tools.	Data mining, predictive modeling, statistical analysis, machine learning, simulations.
<b>Key Questions Answered</b>	What happened? How many/much? What is the current trend?	Why did it happen? What will happen next? What actions should we take?
<b>Users / Audience</b>	Managers and executives needing operational and strategic insights.	Analysts, data scientists, and decision-makers requiring predictive insights for strategy.
<b>Outcome / Benefits</b>	Improves operational efficiency, monitoring, and reporting; provides historical performance visibility.	Drives strategic decision-making, forecasts trends, identifies opportunities, and mitigates risks.
<b>Focus Timeline</b>	Past & present	Future & predictive

31. Discuss various Ethical Frameworks used in any organization. – 10M

<b>Ethical Framework</b>	<b>Focus / Principle</b>	<b>Application in Organizations</b>	<b>Example</b>
<b>Utilitarianism</b>	Maximize overall good / minimize harm	Policies and decisions benefit the majority of stakeholders	Implementing energy-efficient practices to reduce costs and environmental impact
<b>Deontological (Duty-Based)</b>	Follow moral duties, rules, and obligations	Actions judged by adherence to principles like honesty and fairness	Ensuring truthful advertising even if exaggeration could increase sales
<b>Virtue Ethics</b>	Character and integrity of individuals	Encourages employees to cultivate honesty, responsibility, and ethical behavior	Manager making fair promotion decisions based on merit
<b>Rights-Based</b>	Protect fundamental human rights	Decisions respect privacy, freedom, and individual rights	Obtaining consent before using customer data for marketing
<b>Justice / Fairness</b>	Equality, impartiality, fair treatment	Policies and actions should be equitable and non-discriminatory	Equal pay for employees performing the same work
<b>Common Good</b>	Welfare of society as a whole	Decisions consider the broader impact on community and society	Engaging in CSR programs or reducing pollution

32. With neat diagram elaborate on the relationship among ethical, social, political issues in an information society. – 10M



- An **information society** is one where information and communication technologies (ICT) play a central role in social, economic, and political activities. The widespread use of technology gives rise to various **ethical, social, and political issues** that are **interconnected**. Understanding these relationships is important for responsible use of technology.

#### A. Ethical Issues

- Concerned with **what is right or wrong** in the use of information technology.
- Includes: privacy, intellectual property, data accuracy, cybercrime, and professional conduct.
- *Example:* Unauthorized access to personal data is an ethical violation.

#### B. Social Issues

- Related to the **impact of technology on society and individuals**.

- Includes: digital divide, employment changes due to automation, online harassment, and social interaction patterns.
- *Example:* Unequal access to internet resources creates social inequality.

### C. Political Issues

- Concerned with **laws, policies, and governance** regarding information technology.
- Includes: censorship, cybersecurity regulations, digital rights, surveillance, and government control of information.
- *Example:* Government monitoring of internet usage raises political and ethical concerns.

#### - Relationship Among Ethical, Social, and Political Issues

- **Ethical issues** influence **social behavior** and set standards for responsible use of technology.
- **Social issues** affect policy-making and highlight areas requiring **political intervention**.
- **Political issues** provide laws and regulations to enforce ethical standards and address societal concerns.
- **In short:** Ethical decisions → impact society → require political/legal frameworks → which in turn influence ethical norms and social practices.

### 33. Explain in detail all types of threats to IS with examples.

=> An Information System (IS) stores, processes, and transmits data. Threats to IS are potential events or actions that can cause damage, unauthorized access, or disruption to the system. Threats can be deliberate (intentional) or accidental (unintentional).

#### - Types of Threats to Information Systems

**A. Deliberate / Intentional Threats:** These are purposeful actions to harm or exploit an information system.

##### 1. Hacking / Unauthorized Access

- Gaining access to systems or networks without permission.
- *Example:* A hacker breaking into a company database to steal confidential data.

##### 2. Viruses and Malware

- Malicious software designed to disrupt, damage, or gain control of systems.
- Includes viruses, worms, trojans, ransomware, and spyware.
- *Example:* A ransomware encrypting files and demanding payment for decryption.

##### 3. Phishing / Social Engineering

- Tricking users into revealing confidential information.

- *Example:* Fake emails requesting login credentials for a bank account.

#### **4. Denial of Service (DoS) / Distributed DoS (DDoS)**

- Overwhelming systems with requests to make them unavailable.
- *Example:* Flooding a website with traffic to crash it.

#### **5. Insider Threats**

- Malicious actions by employees, contractors, or partners.
- *Example:* A disgruntled employee stealing or deleting sensitive files.

#### **6. Data Theft / Espionage**

- Stealing confidential information for personal, industrial, or political gain.
- *Example:* Exfiltrating trade secrets from a company's servers.

#### **7. Tampering / Sabotage**

- Deliberate alteration or destruction of systems or data.
- *Example:* Modifying software to create a backdoor or corrupting a database.

#### **8. Man-in-the-Middle (MitM) Attacks**

- Intercepting and possibly altering communication between two parties.
- *Example:* Capturing login credentials over unsecured Wi-Fi networks.

**B. Accidental / Unintentional Threats:** These occur without malicious intent but can still cause damage.

- 1. Human Error:** Mistakes by employees or users that compromise system security.  
*Example:* Accidentally deleting critical files or misconfiguring a server.
- 2. Natural Disasters:** Environmental events that disrupt systems. *Example:* Floods, earthquakes, or fires destroying data centers.
- 3. System Failures / Hardware Malfunctions:** Failures in hardware, software, or networks causing downtime. *Example:* Server crashes due to hard disk failure.
- 4. Software Bugs / Application Errors:** Flaws in programs that cause incorrect processing or vulnerabilities. *Example:* An e-commerce site crashing during peak traffic due to a coding bug.