

2802 - DTI

Unit 03

Information Systems in Organizations

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Content...

- 3.1 Evolution of Information Systems in Organizations
- 3.2 Classification of Information Systems in Organization
- 3.3 Electronic and Mobile Commerce
- 3.4 Data Analysis and Business Intelligence
- 3.5 Optimizing Organizational Efficiency and Effectiveness
- 3.6 Digital Transformation Initiatives
- 3.7 Functional IS and ERP's
- 3.8 Investment Appraisal for IT Infrastructure and IS

A man in a dark suit is seated at a desk in a server room, viewed from the side. He is looking at a laptop that displays a dashboard with a line graph and various data points. In the background, there are several tall server racks with glowing blue lights. The entire scene is overlaid with a semi-transparent blue grid and digital data patterns, giving it a high-tech, futuristic feel. A large, faint watermark of a gear and the word 'Zar' is visible across the center of the image.

3.1

Evolution of Information Systems in Organizations



Information systems combine hardware, software, processes, people, infrastructure, and standards to manage and share information.

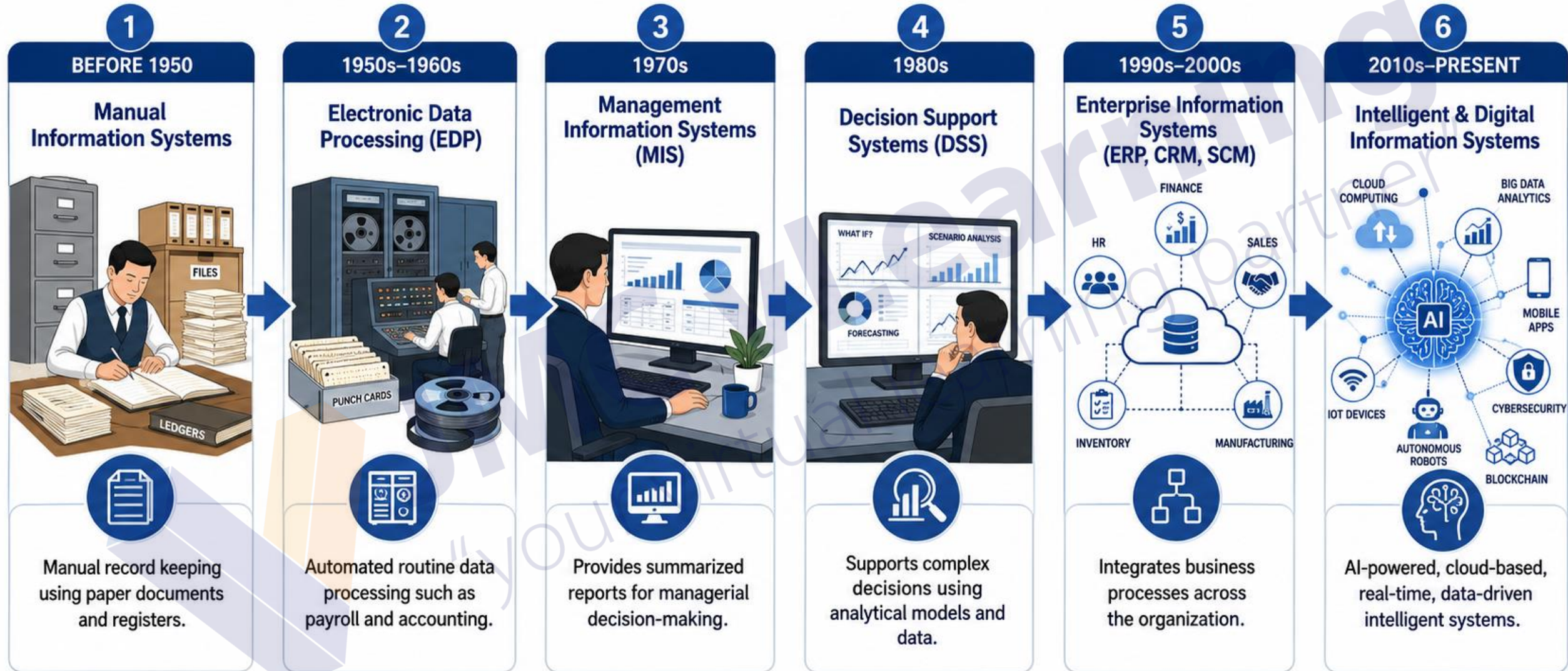
They help organizations improve efficiency, communication, and decision-making.

Information technology (IT) has evolved from a support tool into a strategic business driver.

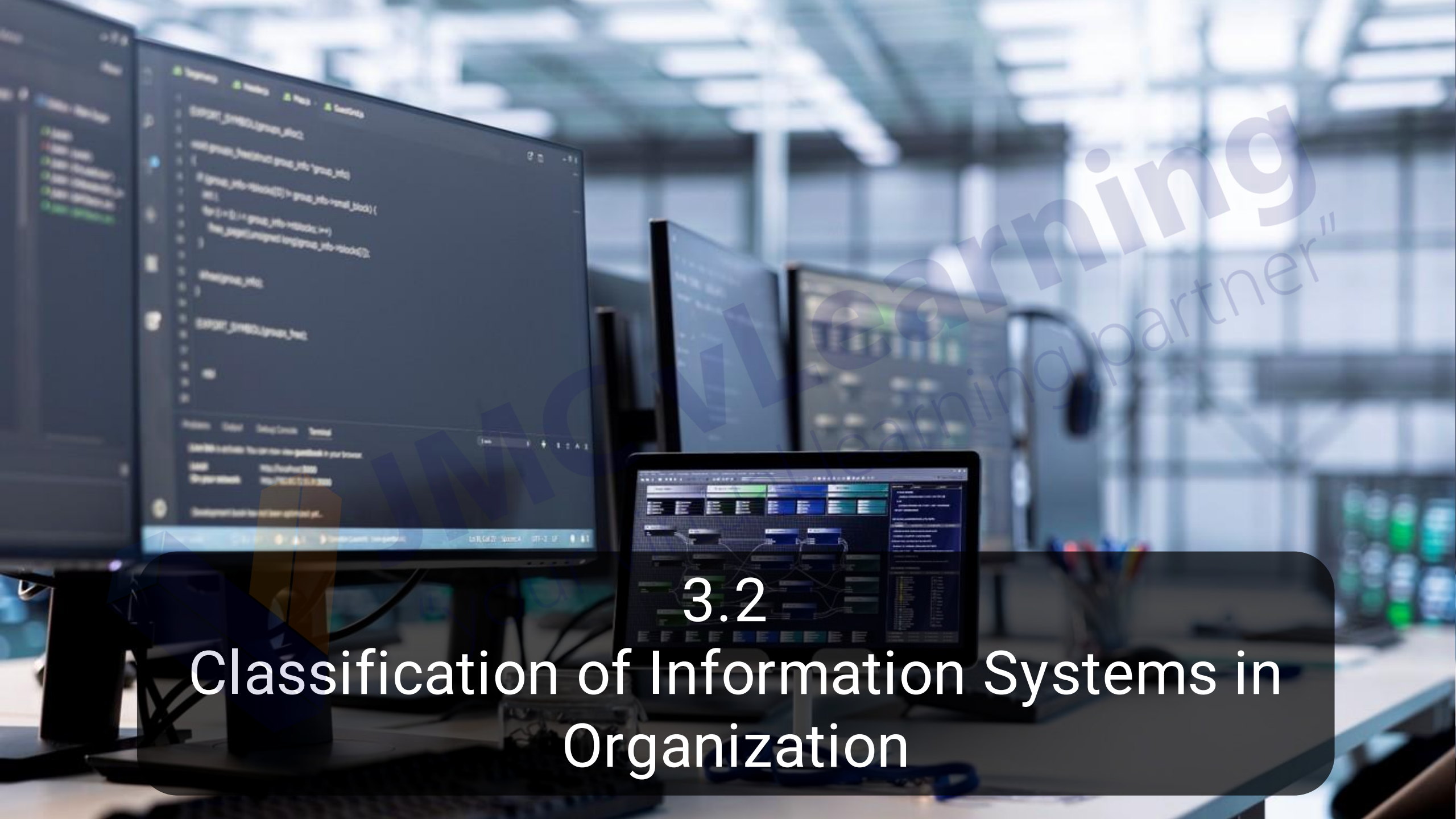
IT enables business process reengineering, organizational restructuring, and market transformation.

Advanced technologies connect employees and knowledge, reducing boundaries between departments and organizational levels.

Evolution of Information Systems



Increasing Automation, Connectivity, Intelligence, and Decision Support



3.2

Classification of Information Systems in Organization



Top Level Management

Strategic Decisions

- DSS, ESS, EIS, AI, Office Automation

Middle level Management

Tactical Decisions

- MIS, DSS, AI, Office Automation

Low level Management

Operational Decisions

- TPS, AI, Office Automation



Operational Management Level

The **operational management level** is responsible for the **day-to-day activities** of an organization. It ensures that daily work is completed efficiently and according to company rules.

Examples of Operational-Level Employees

- Cashiers (POS)
- Bank tellers
- Nurses
- Customer care staff

Decision Making

- Operational-level employees make **structured decisions**, meaning they follow **predefined rules, procedures, and system information**.

Example:

A bank system automatically approves a loan if the customer's credit limit meets the required criteria.



Operational Management Level

Operational managers are responsible for:

- Assigning daily tasks to employees.
- Supervising workers and monitoring productivity.
- Maintaining the quality and quantity of work.
- Ensuring discipline and workplace safety.
- Training employees and providing necessary resources.

Operational managers:

- Act as a link between middle management and employees.
- Guide and supervise workers.
- Maintain quality standards.
- Ensure discipline and safety.
- Support employee training and development.

Purpose of Operational Planning

- Achieve short-term goals.
- Organize daily work.
- Meet deadlines.
- Improve coordination and communication.
- Use practical and technical methods to achieve objectives.

Operational Management Level

Four Questions in Operational Planning

Where are we now?

Where do we want to be?

How do we get there?

How do we measure our progress?

Operational risks are problems that occur because of People, Internal processes, Information systems, External events (natural disasters or human-made threats).

Common Operational Risks

Business interruptions

Employee mistakes

Product failures

Health and safety issues

IT system failures



Tactical Management Level

The **tactical management level** consists:

- Department heads
- Branch managers
- Supervisors
- Section managers

They act as a **bridge between top management and operational management**, ensuring that the organization's plans are successfully implemented.

Decision Making

Tactical managers make **semi-structured decisions**.

This means that **part of the decision is based on rules and existing information, while the remaining part depends on the manager's experience and judgment.**

Example:

A bank manager reviews a customer's payment history and financial records before deciding whether to increase the customer's credit limit.



Tactical Management Level

Tactical managers are responsible for:

- Implementing the plans and policies created by top management.
- Preparing plans for their departments or divisions.
- Recruiting and training lower-level managers.
- Explaining company policies to operational staff.
- Coordinating activities within departments.

Tactical managers:

- Connect top management with operational management.
- Coordinate departmental activities.
- Ensure organizational policies are properly implemented.
- Monitor departmental performance.
- Support and motivate employees for better results.

Tactical planning focuses on **short- to medium-term goals** and supports the organization's strategic plans by turning them into departmental action plans.



Tactical Management Level

Purpose of Tactical Planning

- Convert strategic goals into departmental plans.
- Improve coordination between departments.
- Allocate resources effectively.
- Monitor departmental performance.
- Support the achievement of organizational objectives.



Strategic Management Level

The **strategic management level** is the **highest level of management** in an organization. It focuses on **long-term goals, planning, and overall business direction**.

Examples of Strategic-Level Managers

Board of Directors

Chief Executive Officer (CEO)

Chief Operating Officer (COO)

Decision Making

Strategic managers make **unstructured decisions**. These decisions **do not follow fixed rules** and require experience, judgment, creativity, and analysis because they deal with complex and uncertain situations.

Example:

A CEO decides whether to expand the business into a new country or launch a new product line.



Strategic Management Level

Strategic managers are responsible for:

- Setting the organization's vision, mission, and long-term objectives.
- Developing overall strategies and business policies.
- Approving budgets, procedures, and organizational plans.
- Appointing middle-level managers.
- Coordinating and controlling all departments.

Strategic managers:

- Set the overall direction of the organization.
- Make major business decisions.
- Allocate organizational resources.
- Monitor overall business performance.
- Take responsibility for the organization's success.

Key Questions in Strategic Planning

What do we do?

Who are our customers? (For whom do we do it?)

How can we perform better than our competitors?



Strategic Management Level

Strategic planning focuses on the **long-term future** of the organization.

It determines the organization's direction and how resources should be used to achieve long-term objectives.

Purpose of Strategic Planning

- Define the organization's vision and mission.
- Set long-term goals.
- Develop business strategies.
- Allocate resources effectively.
- Gain and maintain a competitive advantage.

Strategic risks are risks that affect the organization's long-term objectives and are often **beyond management's direct control**.

Examples of Strategic Risks

- Wars and political conflicts
- Economic recessions
- Geopolitical changes

A person is seen from the side, working at a computer in a server room. The background is a blurred city skyline at night with bokeh light effects. A large, semi-transparent watermark 'VLC vlearning' is visible across the center of the image. The text 'Information systems in different management levels' is displayed in a white, sans-serif font within a dark, rounded rectangular box at the bottom.

Information systems in different management levels



The various types of information systems that an organization uses may be classified into the following categories:

1. Office Automation Systems (OAS)
2. Transaction Processing System (TPS)
3. Management Information System (MIS)
4. Decision Support Systems (DSS)
5. Executive Information Systems (EIS)
6. Business Expert System (BES)



Office Automation Systems

- Office automation is the process of **collecting, merging, and managing organizational information** using **software and hardware** to complete business tasks.
- It helps in **automating office tasks** and mainly supports **operational-level activities**.
- It has a **limited role in decision-making**, but supports **rule-based decisions** for operational managers.
- It helps create a **paperless office environment** and improves **productivity and efficiency**.



Advantages of Office Automation Systems

1. Reduces **manual effort** in routine/repetitive tasks
2. Minimizes **manual errors**
3. Reduces **processing time**
4. Improves **process visibility** and identifies bottlenecks
5. Supports **better data-based business decisions**
6. Makes office functions **faster and more process-driven**
7. Allows **efficient digital storage of data** for future use

Example: **MS Office applications** (Word, Excel, PowerPoint) used for automating office tasks such as **word processing, spreadsheets, and presentations.**



Transaction Processing System (TPS)

TPS **monitors, collects, stores, and processes data** from business transactions.

Its purpose is to **provide information for management** and ensure **efficient business operations**.

Characteristics of TPS

- Processes a **large volume of data**
- Data is mainly **collected internally**
- **Structured input and output**
- **Low computational complexity**
- Requires **high accuracy and data integrity**

Examples of TPS

EPOS systems – record daily sales

Payroll systems – manage salaries and loans

Stock control systems – track inventory

Airline reservation systems – manage seat bookings



Transaction Processing System (TPS)

TPS in Functional Areas

Accounting & Finance: Financial IS, Accounting IS

Marketing & Sales: POS system, Sales Order IS

Production & Operations: Inventory, Quality Control, Machine Control systems

Human Resources: HRIS, Payroll, Staff Evaluation systems

Information Flow in TPS

A flow of information in a typical TPS can be described as follows:

1. An event is recorded by data entry equipment.
2. The TPS program will update the database.
3. TPS program will generate routine reports and.
4. Users can also send a query to the TPS program

Types of TPS

1. Stand-alone system;
2. Enterprise client-server system
3. Web-based system.

Stand Alone System	Enterprise Client-server System	Web-based System
A stand-alone system is a simple information system used by a single user. It is typically used in a small office environment. Both the TPS software and data are stored on one PC.	An enterprise client-server system operates in an enterprise-wide network environment. It connects servers and client PCs within the organization. Data is stored centrally on the server. TPS client software is installed on user PCs to access server data.	In a web-based system, TPS software is not installed on the user's PC. Users access the system through a web browser using a URL. Designed to support a large number of users. Uses high-performance servers to host the software and data.
Example: A small retail shop uses a single computer with billing software to record daily sales and manage transactions.	Example: A company uses a central server to store employee and sales data, while staff access it through their office computers using a network-based system.	Example: An organization uses an online payroll system where employees log in through a website to view salaries and records.



Batch or Online Processing

TPS can process data in two different ways:

1. Batch processing
2. Online processing

In **batch processing**, data from transactions are collected and grouped together.

The system then processes the group of data (called batches) periodically, for example every hour.

In **online processing**, data are processed without batching, but not necessarily in real time.



Management Information System (MIS)

Management Information Systems (MIS) are used by middle-level tactical managers to monitor the current performance of an organization.

MIS receives input data from Transaction Processing Systems (TPS) and processes it into useful information through data collection, processing, sorting, summarizing, and distributing reports.

These reports help managers monitor, regulate, and predict future performance.

Examples of MIS

Sales Management Systems – use input from point of sale systems.

Budgeting Systems – provide an overview of organizational spending for short-term and long-term activities.

Human Resource Management Systems – manage employee welfare and information.



Major Types of MIS

Marketing Information System (MkIS) –

Helps marketing staff evaluate past and current campaigns and plan future campaigns.

Business Intelligence System (BIS) –

Supports business decisions through collection, integration, and analysis of data. Used by both lower-level managers and executives.

Customer Relationship Management System (CRM) –

Stores customer information such as previous sales, contact details, and sales opportunities. Used by marketing, sales, customer service, and business development staff.

Sales Force Automation System (SFA) –

A part of CRM that automates sales-related tasks like contact management, tracking, and order management.



Major Types of MIS

Knowledge Management System (KMS) –

Supports creation, capture, storage, and sharing of organizational knowledge and information.

Financial Accounting System (FAS) –

Manages financial and accounting activities such as accounts payable and receivable.

Human Resource Management System (HRMS) –

Maintains employee performance records and payroll data.

Supply Chain Management System (SCM) –

Used by manufacturing companies to manage the flow of resources, raw materials, and services from purchasing to shipping



Types of MIS Reports

1. Periodic / Scheduled Reports

Created regularly to analyze data over time.

Examples: daily sales reports and weekly attendance reports.

2. Exception / Ad-hoc Reports

Generated when unusual situations occur.

Examples: credit limit exceeding approved levels or excessive damaged products in production.

3. On-demand / Real-time Reports

Allow monitoring of changes immediately as they happen.

Example: checking a customer's account report before approving a loan.



Decision Support System (DSS)

Decision Support System (DSS) is a computerized information system that supports business and organizational decision-making activities.

DSS uses summarized information, exceptions, patterns, trends, and analytical models to assist decision-making.

It helps decision makers identify and solve problems, but it does not directly make decisions itself.

DSS is mainly used by senior management to make ad-hoc decisions. It receives input from internal sources such as TPS and MIS systems, as well as external information systems.

The main objective of DSS is to provide solutions for unique and rapidly changing situations.

Financial Planning Systems

- o Help managers evaluate alternative ways of achieving goals.
- o Aim to find the best or optimal solution. a given time period.



Decision Support System (DSS)

Programmed Decisions

- Generated through automated processes and routine work.
- Decisions have been made many times before.
- Follow defined rules or guidelines.

Non-programmed Decisions

- Occur in unusual and ad-hoc situations.
- Usually require new decisions.
- Do not follow fixed rules.
- Based on available information.
- Depend on the decision maker's preference, instinct, perception.

Attributes of a DSS

1. Adaptability and flexibility according to situations
2. Highly interactive
3. Easy to use
4. High efficiency and effectiveness
5. Complete control by decision makers
6. Extendibility
7. Support for modelling and analysis
8. Better access to data



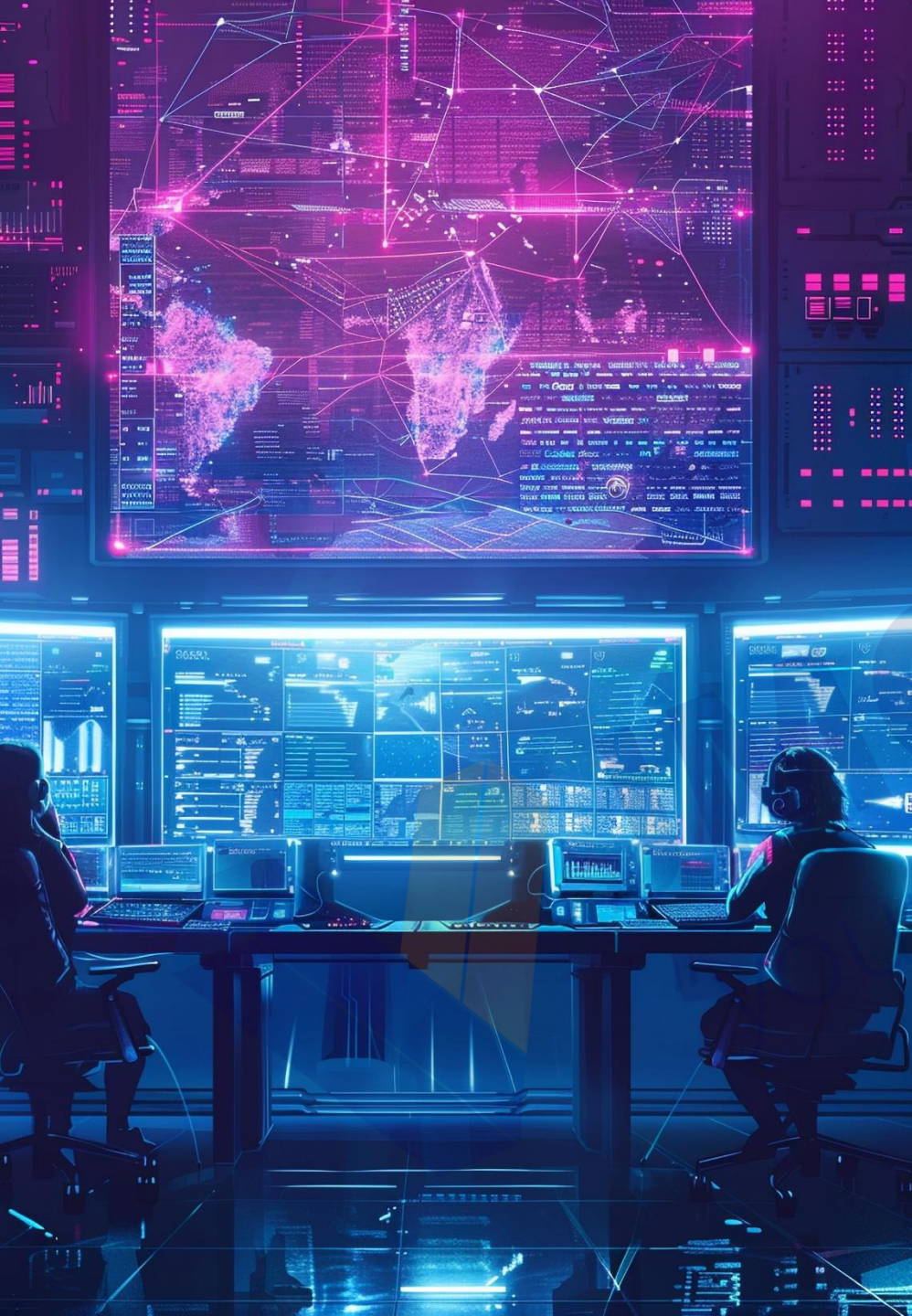
Decision Support System (DSS)

Features of DSS

1. Supports **semi-structured and unstructured decision-making problems**
2. Supports **all managerial levels** (top executives to line managers)
3. Supports **individual and group decision-making** across departments
4. Supports **interdependent and sequential decisions**
5. Supports all phases: **intelligence, design, selection, implementation**
6. Supports **different decision processes and methods**
7. **Adaptive** to time and changing situations

Benefits of DSS

1. Improves **speed and efficiency** of decision-making
2. Increases **control, competitiveness, and decision capability**
3. Enhances **interpersonal communication**
4. Supports **non-programmed decisions** and generates new insights
5. Helps **automate managerial processes**



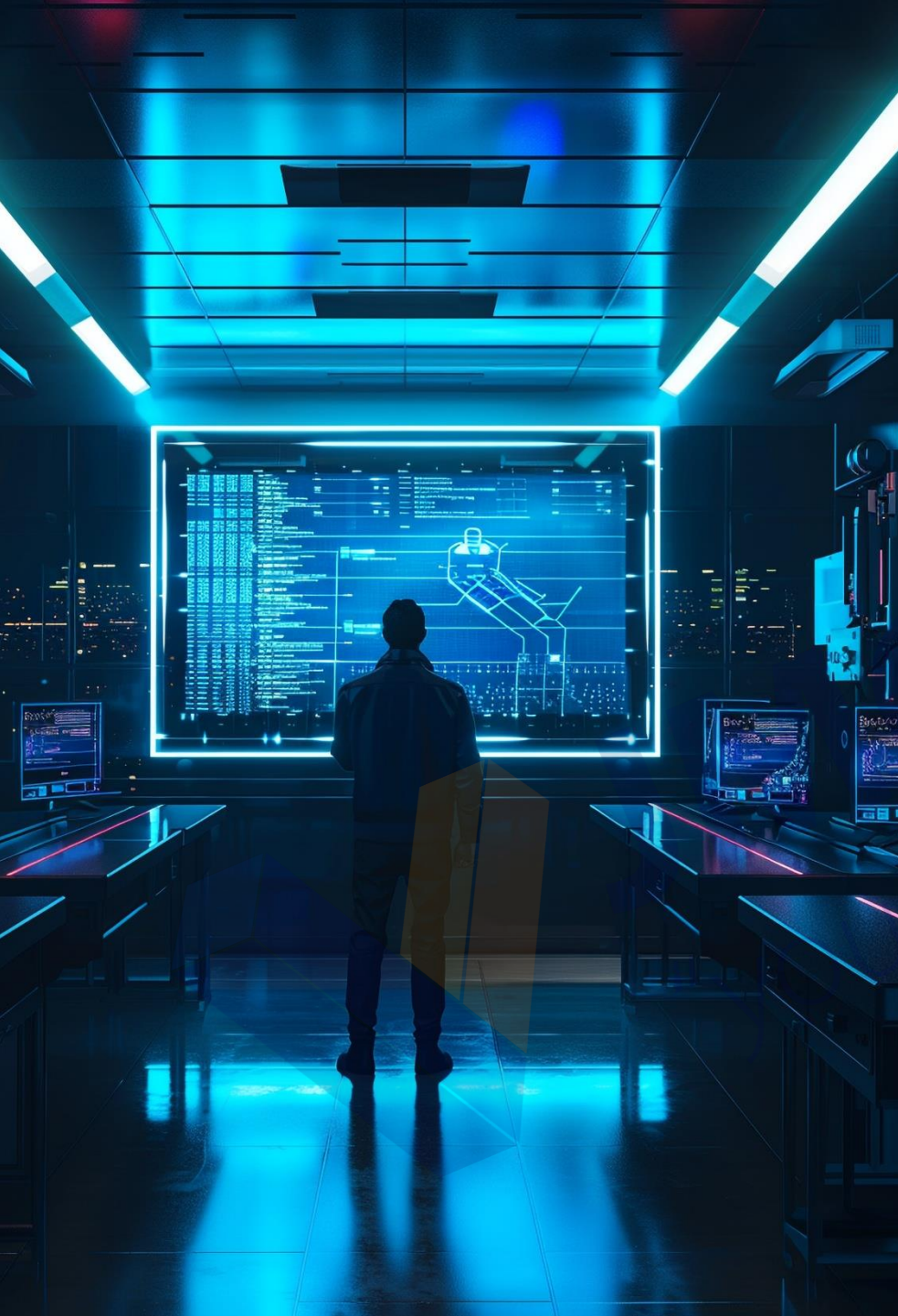
Decision Support System (DSS)

Components of DSS

1. **Database Management System (DBMS)** – uses internal and external data (from TPS, MIS, etc.)
2. **Model Management System** – stores models for decision-making (e.g., forecasting, financial analysis)
3. **Support Tools** – includes help systems, graphical analysis, and error correction tools

Types of DSS

1. **Status Inquiry System** – supports operational and managerial decisions (e.g., job scheduling)
2. **Data Analysis System** – uses formulas/algorithms for analysis (e.g., cash flow, inventory analysis)
3. **Information Analysis System** – generates reports from data (e.g., sales, market analysis)
4. **Accounting System** – tracks financial data (e.g., accounts receivable/payable, final accounts)



Executive Information System (EIS)

An EIS provides **strategic information** for **executives and decision-makers**, with **graphical displays, easy-to-use interfaces, reporting, and drill-down capabilities**.

It supports **long-term trends and strategic issues** inside and outside the organization.

Characteristics & Capabilities of EIS

1. **Drill-down capability** – detailed analysis of data
2. **Critical Success Factors (CSFs)** – key factors for organizational success
3. **Better access to information** – fast, real-time operational data
4. **Analysis** – uses mathematical models for optimization and prediction
5. **Exception reporting** – highlights only abnormal performance
6. **User-friendly interface** – simple, often with visual/audio alerts
7. **Better communication facilities** – email, file transfer, internet-based communication



EIS Components

1. Hardware

Input devices – data entry and updates

CPU – controls system operations

Storage devices – save organizational data

Output devices – display or print information

2. Software

Text base – documents

Database – internal and external data access

Graphic base – charts, graphs, maps, etc.

Model base – statistical and financial models

3. Interface

Includes reports, menus, Q&A systems, command language, forms, etc.

Must be **simple, flexible, and user-friendly** to match decision-making styles

4. Telecommunications

Supports data transfer across networks and cloud systems

Essential for modern decentralized organizations



Applications of EIS

- Helps users access and analyze data based on criteria
- Supports evaluation of organizational goals
- Used in **manufacturing, marketing, and finance**
- Helps distinguish between **critical and less important data**

Advantages

1. Easy for top-level users
2. Simple and understandable information
3. Filters important data
4. Improves tracking of information
5. Enhances decision-making efficiency

Disadvantages

1. Limited complex calculations
2. Possible information overload
3. Can become slow and difficult to manage
4. Difficulty keeping data updated
5. Risk of unreliable or insecure data

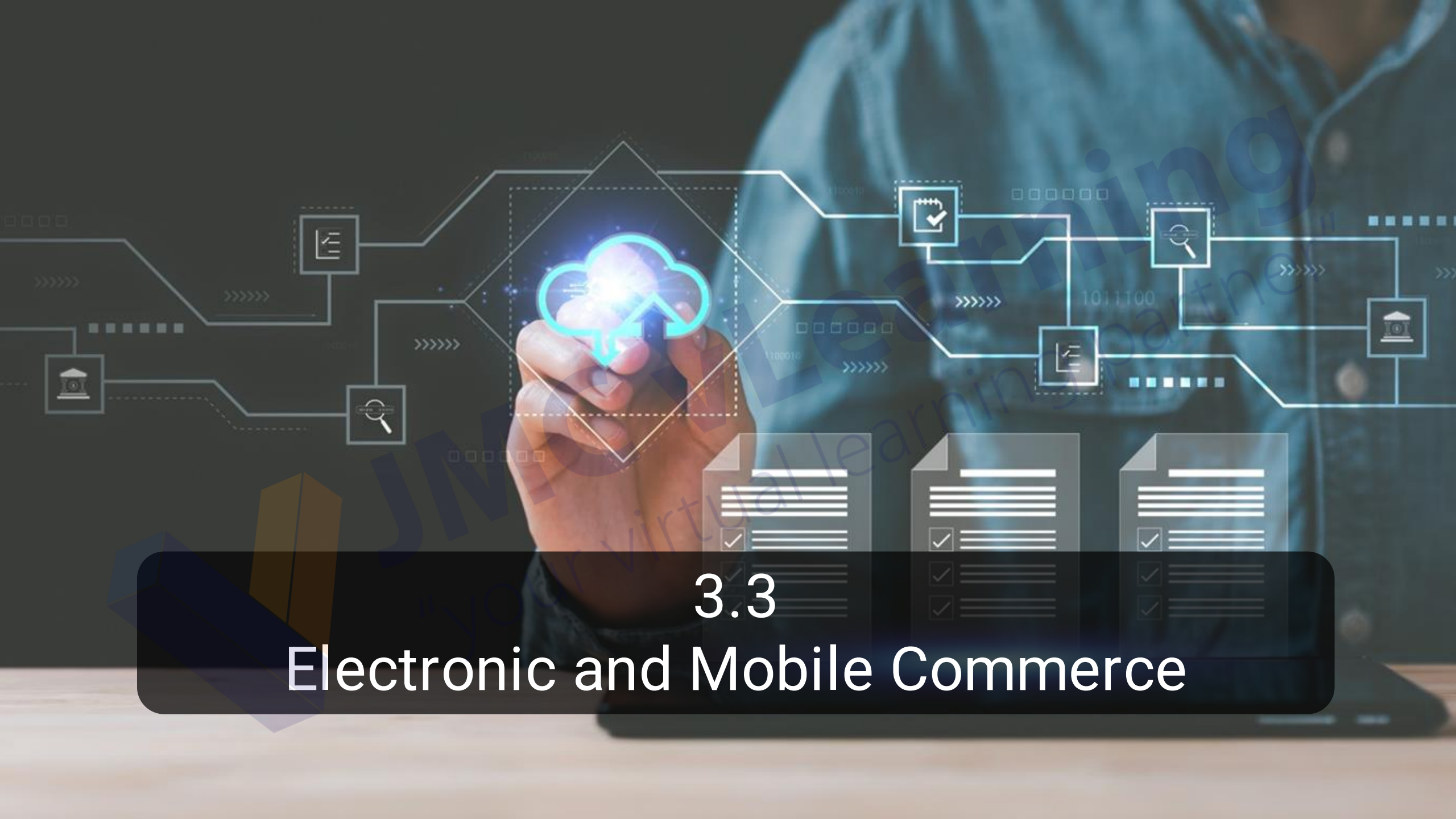


Business Expert Systems (BES)

Computer-based systems using **AI and neural networks** to simulate human expert decision-making.

They can make decisions using **stored expert knowledge without human intervention.**

AI systems identify patterns in large datasets and are widely used by companies like **eBay, Facebook, and Google.**



3.3

Electronic and Mobile Commerce



E-Commerce

Electronic commerce (e-commerce) refers to any business or commercial transaction conducted over the Internet involving the **transfer of information**.

It includes various types of businesses such as **retail websites, auction platforms, music sites, and business-to-business exchanges**.

E-commerce allows the **electronic exchange of goods and services without time or distance barriers**.

When properly implemented, e-commerce is **faster, cheaper, and more convenient** than conventional business methods.

Electronic Data Interchange (EDI) is an early form of electronic transactions used by businesses.

EDI requires **dedicated data links between suppliers and customers**, making it less flexible. In contrast, e-commerce offers a **cost-effective and flexible system with multiple connections**.

Category	Explanation	Key Features / Points
(B2C)	Transactions take place directly between a business and a consumer through a website.	Requires heavy advertising to attract customers. Needs high investment in hardware/software Requires good customer support service
(B2B)	Transactions occur between businesses, where products are sold to an intermediate buyer.	Both buyer and seller are business entities Builds relationships with distributors, suppliers, and resellers Covers many industries such as: Electronics, Shipping & Warehousing, Motor Vehicles, Paper, Office Products, Food, Agriculture
(C2C)	Transactions occur between individuals selling products/services to each other.	Involves individual sellers and buyers Uses online auction systems Includes competitive bidding over the Internet
(G2C)	Government uses the Internet to provide services and information to citizens, businesses, and suppliers.	Provides efficient and effective services Improves interaction between government and citizens/businesses Reduces cost and increases accessibility



Advantages of E-Commerce

Category	Explanation
Advantages to Organizations	Expands market to national and international levels with minimum investment. Helps find more customers, best suppliers, and business partners globally. Reduces cost of creating, processing, distributing, and managing paper-based information. Improves the brand image of the company. Provides better customer service. Simplifies business processes and makes them faster and more efficient. Reduces paperwork. Increases productivity through “pull-type” supply management (just-in-time).

Category	Explanation
Advantages to Customers	Provides 24/7 access to products and services. Offers more options and faster delivery. Allows easy comparison of prices and quality. Enables customers to read and give reviews before purchasing. Supports virtual auctions. Provides instant access to detailed information. Increases competition, leading to better prices and discounts.

Category	Explanation
Advantages to Society	Reduces need for travel, leading to less traffic and lower air pollution. Lowers product costs, making goods affordable to more people. Provides access to products and services in rural areas. Helps government deliver services like healthcare, education, and social services efficiently and at lower cost.

M-Commerce

Mobile commerce or m-commerce, refers to **ecommerce conducted in a wireless environment over the Internet.**

There are a number of factors supports m-commerce. These factors includes:

The **widespread availability** and **popularity** of wireless devices like smart phones.

The **declining cost of wireless technology**, the **convenience of instant connectivity** from any location.

Bandwidth improvements that **increase the speed of data transmission.**



Mobile banking	Mobile accounting	Allows users to manage accounts, view balances, and perform basic banking transactions via mobile apps.
	Mobile brokerage	Enables users to buy and sell stocks or manage investments using mobile devices.
	Mobile financial information	Provides real-time access to financial data such as exchange rates, account updates, and market information.

Mobile entertainment	Mobile gaming	Lets users play games on mobile devices for entertainment and engagement.
	Music and ringtone downloads	Allows downloading and personalizing devices with music tracks and ringtones.
	Video and digital image downloads	Enables access and download of multimedia content like videos and images.
	Location-based entertainment services	Provides entertainment content based on the user's physical location.

Mobile information services	Current affairs (news, sports, finance)	Delivers up-to-date news and information on various topics in real time.
	Travel information	Provides details such as routes, schedules, and travel updates for users.
	Tracking services (persons and objects)	Allows real-time tracking of people, goods, or devices using mobile technology.
	Mobile search engines	Enables users to search for information on the internet using mobile devices.

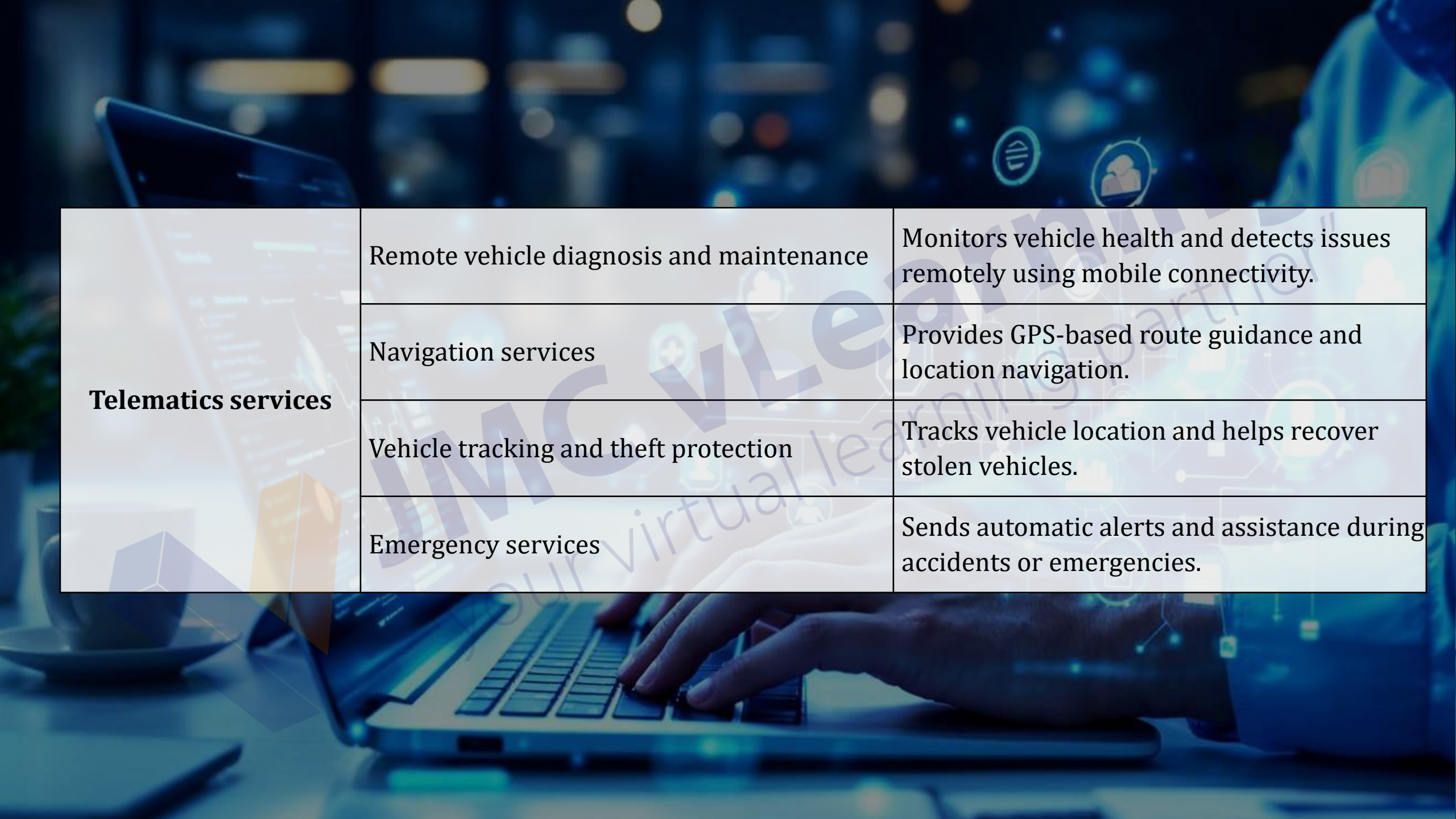
Mobile shopping	Mobile purchasing of goods and services	Allows users to buy products and services directly through mobile platforms.
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Mobile marketing	Mobile couponing	Sends digital coupons to users for discounts and promotions.
	Direct/context-sensitive marketing	Delivers targeted ads based on user behavior, location, or preferences.
	Mobile events	Promotes and manages events through mobile notifications and apps.
	Mobile newsletters	Sends regular updates and promotional content to subscribers via mobile.

Mobile ticketing	Public transport ticketing	Enables digital ticket purchase for buses, trains, and other public transport.
	Sports and cultural events	Allows booking and storing tickets for events via mobile devices.
	Air and rail traffic ticketing	Supports booking and managing airline and train tickets on mobile apps.
	Mobile parking	Allows users to pay for and manage parking digitally.



Telematics services	Remote vehicle diagnosis and maintenance	Monitors vehicle health and detects issues remotely using mobile connectivity.
	Navigation services	Provides GPS-based route guidance and location navigation.
	Vehicle tracking and theft protection	Tracks vehicle location and helps recover stolen vehicles.
	Emergency services	Sends automatic alerts and assistance during accidents or emergencies.



Differences between E-commerce and M-commerce

Mobility:

E-commerce is usually done on desktops or laptops in fixed locations, while m-commerce allows users to conduct transactions anywhere using mobile devices with internet access.

Reachability:

M-commerce has a wider reach because mobile devices are portable and always connected, allowing businesses to target users in more locations than traditional e-commerce.

Convenience:

M-commerce is more convenient as transactions can be completed quickly through mobile apps with a few taps, whereas e-commerce often requires a computer and a more stable setup.



Differences between E-commerce and M-commerce

Location tracking:

M-commerce can use GPS and mobile technologies to identify user location and deliver personalized, location-based services, unlike e-commerce which has limited tracking ability.

Security:

M-commerce offers enhanced security features such as biometric authentication (fingerprint, face ID) in addition to standard methods like passwords and two-factor authentication, making it more advanced in some cases than traditional e-commerce.



3.4

Data Analysis and Business Intelligence



Business Intelligence (BI)

Business Intelligence (BI) refers to the tools, technologies, applications and practices used to collect, integrate, analyze and present an organization's raw data in order to create information which is useful to entire business.

Data mining

Data Mining is defined as extracting information from large data sets called, data warehouses. In other words, that data mining is a technique of mining knowledge to identify trends and hidden relationships exist in data sets.

The information or knowledge extracted so can be used for any of the following application areas.

- Market Analysis
- Fraud Detection
- Customer Retention
- Production Control
- Science Exploration

Data mining applications

Area	Key Uses	Explanation
Market Analysis & Management	Customer profiling	Identifies what types of customers buy specific products.
	Identifying customer requirements	Predicts customer needs and suggests suitable products.
	Cross market analysis	Finds relationships and correlations between product sales.
	Target marketing	Groups customers with similar characteristics like income, interests, and behavior.
	Purchasing pattern analysis	Understands how and when customers buy products.
	Summary reporting	Provides multidimensional reports for decision-making.

Data mining applications

Area	Key Uses	Explanation
Corporate Analysis & Risk Management	Financial planning & asset evaluation	Analyzes cash flow and predicts financial outcomes to evaluate assets.
	Resource planning	Compares and manages organizational resources and expenses.
	Competition analysis	Monitors competitors and market trends.



Data mining applications

Area	Key Uses	Explanation
Fraud Detection	Fraud identification	Detects suspicious activities in banking and telecom sectors.
	Call pattern analysis	Studies call duration, timing, and destination to identify fraud.
	Anomaly detection	Finds deviations from normal patterns to prevent fraud.



Benefits of Business Intelligence (BI)

1. Faster and better decision-making
2. Improved business process efficiency
3. Increased operational efficiency
4. Identification of new revenue opportunities
5. Competitive advantage
6. Detection of market trends and patterns
7. Identification of business problems



Business Intelligence Systems

BI systems help users analyze data using tools such as reports, dashboards, and visualizations.

They allow users to make decisions based on data rather than assumptions.

BI systems typically provide:

- Historical data analysis
- Current performance tracking
- Predictive insights

Common Issues in BI Systems

- User resistance to new systems
- Poor data quality or inconsistent data
- Lack of understanding of business processes



Online Analytical Processing - OLAP

OLAP refers to the general activity of **querying and Reporting** textual or numeric data from warehouses and/or data marts for analytical purposes.

OLAP uses data from data warehouses and data marts.

OLAP includes querying and Reporting.

QUERYING: Refers to the action of retrieving data from a database.

REPORTING: Business Intelligence reporting is referred to the process of receiving/ providing information or reports to end-users in an organization or as inputs to another application through a BI Systems.

Business Analytics vs Business Intelligence

Aspect	Business Intelligence (BI)	Business Analytics (BA)
Focus Questions	What happened? When did it happen? Who was involved? How many?	Why did it happen? Will it happen again? What will happen if we change X? What other insights can be found?
Purpose	Describes past and current business performance	Explains, predicts, and improves future outcomes
Type of Analysis	Descriptive analysis	Statistical, predictive, and advanced analysis
Includes	Reports Dashboards Automated alerts Ad-hoc queries	Data mining Statistical analysis Predictive modelling
Nature of Output	Structured reports and summaries	Insights, predictions, and recommendations



The background image shows a laptop screen displaying a complex digital dashboard. The interface features a dark blue and purple color palette with glowing lines and various data visualizations. On the left, there's a sidebar with icons for 'Account', 'Home', 'Transaction', and 'Settings'. The main area contains a 'Portfolio' section with three items showing percentages and dollar amounts (\$98,365, \$65,235, and \$25,687). A large line graph with multiple colored peaks is prominent in the center. To the right, there's a 'Discover Now' section with a bar chart and a 'Activities' section with another bar chart. The overall aesthetic is high-tech and data-driven.

3.5 Optimizing Organizational Efficiency and Effectiveness



Business Process Re-engineering



Business Process Reengineering (BPR)

Focus on Core Processes

BPR identifies the most important business processes that affect customer satisfaction and organizational goals, then improves or redesigns them for better performance.

Customer-Centric Approach

The redesign process focuses on customer needs, ensuring products and services meet or exceed expectations.

Use of Technology

Modern technologies like automation, data analytics, and workflow systems are used to improve efficiency and reduce manual work.

Elimination of Redundancies

Unnecessary steps, repeated tasks, and non-value-adding activities are removed to make processes more efficient.

Emphasis on Outcomes

Focus is placed on measurable results such as cost reduction, higher productivity, improved quality, and faster service delivery.



Key Challenges of BPR

Resistance to Change

Employees and management may resist due to fear of job loss or disruption, and organizational culture may oppose major changes.

High Costs

Implementing BPR requires investment in technology, training, and system redesign, which can be expensive.

Lack of Clear Vision

Without clear goals, BPR efforts may become unfocused and fail to achieve expected outcomes.

Process Complexity

Large organizations have complex workflows, making it difficult to properly analyze and redesign processes.

Business Disruption

Changes can temporarily reduce productivity and affect customer service during implementation..



Business Process Outsourcing



Business Process Outsourcing (BPO)

Business Process Outsourcing (BPO) is the practice of outsourcing non-core business activities to external service providers.

These activities include functions such as customer support, data entry, payroll, human resources, and accounting.

BPO is mainly divided into two types:

Back-Office BPO: Involves internal business functions such as accounting, IT services, human resources, payment processing, compliance, and quality assurance.

Front-Office BPO: Involves customer-facing services such as technical support, sales, and marketing.

01

OFFSHORE OUTSOURCING (OFFSHORING)



Services are outsourced to companies in distant foreign countries.



ADVANTAGES

- ✓ Significant cost savings due to lower labor costs
- ✓ Access to a large skilled workforce
- ✓ Ability to operate 24/7 due to time zone differences



CHALLENGES

- Language and cultural differences
- Communication difficulties
- Possible delays due to distance

02

ONSHORE OUTSOURCING (DOMESTIC OUTSOURCING)



Services are outsourced to providers within the same country.



ADVANTAGES

- ✓ Better communication
- ✓ No language barriers
- ✓ Cultural alignment
- ✓ Compliance with local laws and regulations



LIMITATION

- Higher cost compared to offshore outsourcing

03

NEARSHORE OUTSOURCING



Services are outsourced to companies in nearby or neighboring countries.



ADVANTAGES

- ✓ Similar time zones
- ✓ Easier communication
- ✓ Cultural similarities
- ✓ Relatively lower cost than onshore outsourcing

Types of BPO

Service Type	Description	Examples
Information Technology Enabled Services (ITES)	Uses IT systems and networks to deliver efficient business solutions. Focuses on technology-based support services.	Service desk analyst, IT analyst, production support
Knowledge Process Outsourcing (KPO)	Provides knowledge-intensive and core business functions. Requires specialized skills and domain expertise.	Research, data analysis, product rebranding
Legal Process Outsourcing (LPO)	A subset of KPO that handles high-level legal services and support.	Contract preparation, legal research, reviewing agreements
Research Process Outsourcing (RPO)	A subset of KPO focused on research and analytical services across various industries.	Market research, financial analysis, scientific research
Travel and Logistics	Manages travel and logistics operations to reduce costs and improve customer service.	Ticketing, hotel booking, transportation arrangements



Advantages of BPO

Financial Benefits

Outsourcing reduces costs as external providers can perform tasks more cheaply due to lower labour and operational expenses.

Flexibility

Organizations can easily adjust outsourced processes according to market changes and business needs.

Competitive Advantage

Companies can focus on core activities like customer service and innovation by outsourcing non-core functions.

Higher Quality & Better Performance

Specialized BPO providers deliver services with greater accuracy, efficiency, and speed.

Innovation and Technology

Access to modern technologies and improved processes used by outsourcing partners.



Advantages of BPO

Faster Turnaround Times

Enables quick reporting, improved productivity, and faster response to business requirements.

Scalability

Businesses can increase or decrease operations without investing in additional resources.

Compliance with Regulations

Providers ensure adherence to industry standards and legal requirements.

Data Insights and Analytics

Access to analytical insights that support better decision-making.

24/7 Operations

Allows continuous service delivery, especially for global operations and customer support.



Future Directions of BPO

Automation & AI:

Automation, artificial intelligence (AI), and robotic process automation (RPA) will become more widely used in BPO operations.

These technologies will reduce manual workloads, improve efficiency, streamline routine tasks, enhance accuracy, and support better decision-making and workflow optimization.

Cloud-based Solutions:

Cloud computing will continue to transform the BPO industry by enabling flexible, scalable, and remote operations.

It allows organizations and service providers to collaborate more effectively, access and share data in real time, and deliver services seamlessly across different locations.



Future Directions of BPO

Data Analytics and Insights:

BPO providers will increasingly rely on big data analytics and business intelligence tools to generate meaningful insights.

This helps organizations understand customer behaviour, market trends, and operational performance, leading to more informed and strategic decision-making.

Industry-Specific BPO Services:

The future of BPO will move toward specialized services tailored to specific industries such as healthcare, finance, and retail.

This specialization allows providers to better address unique industry challenges, improve service quality, and deliver more value-added solutions to clients.



Role of Information Technology in BPO and BPR in Optimizing Organizations

1. Automation of Routine Tasks

IT uses tools like **Robotic Process Automation (RPA)** to automate repetitive tasks, reducing errors and saving time.

2. Streamlined Process Integration

IT connects departments and systems, enabling smooth information flow and seamless integration of outsourced services.

3. Real-Time Communication

IT provides tools like **video conferencing, cloud platforms, and instant messaging** for faster communication and better teamwork.

4. Data-Driven Decision Making

IT uses **analytics and reporting tools** to provide insights that improve services and optimize business processes.



Role of Information Technology in BPO and BPR in Optimizing Organizations

5. Enhanced Security and Compliance

IT protects data through **encryption, firewalls, and security controls** while ensuring compliance with regulations.

6. Cost Optimization

IT lowers operational costs by automating processes and improving resource utilization.

7. Scalability and Flexibility

IT enables businesses to easily scale operations and adapt to changing business requirements without major disruptions.



3.6

Digital Transformation Initiatives



Digital Transformation

Digital transformation is the integration of digital technologies such as cloud computing, AI, automation, and data analytics into all areas of a business, changing how it operates and delivers value to customers.

It focuses on improving efficiency, enhancing customer experience, creating innovation, and developing new business models.

It helps organizations work faster, reduce costs, and improve productivity while encouraging innovation and better collaboration.



Digital Transformation

Improved Efficiency	
Automation of Processes	Repetitive tasks are automated using digital tools, reducing errors and improving speed and productivity.
Data-Driven Decision Making	Real-time data analysis helps identify inefficiencies, predict issues, and support faster, smarter decisions.
Communication & Collaboration	Cloud tools enable real-time communication, remote teamwork, and easier sharing of information and resources.
Cost Reduction	Digital systems reduce manual work and physical resources, lowering operational costs and improving efficiency.



Digital Transformation

Promoting Innovation

New Business Models

Enables models like subscriptions and digital platforms, creating new revenue streams and flexibility.

Faster Product Development

Digital tools speed up design, testing, and development, reducing time to market.

Enhanced Customer Experience

Personalization and digital engagement improve satisfaction, loyalty, and customer retention.

Emerging Technologies

AI, IoT, and ML support automation, real-time insights, and smarter business solutions.

Challenges of Digital Transformation

High Initial Costs: Significant investment is needed for new technologies, infrastructure, and employee training.

Resistance to Change: Employees may struggle to adapt to new systems, causing delays in adoption and reduced productivity.

Complexity: Integrating multiple digital systems and processes requires proper planning and expertise.

Security Risks: Increased use of digital and cloud systems raises risks of cyberattacks and data breaches.

Skill Gaps: Lack of skilled employees may require additional training or hiring.

Implementation Downtime: System changes can temporarily disrupt normal business operations.





Challenges of Digital Transformation

Over-reliance on Technology: Dependence on systems increases vulnerability to technical failures.

Loss of Personal Touch: Automation may reduce human interaction in customer service and internal communication.

Uncertain ROI: Benefits may take time to appear, making returns on investment unclear initially.

Data Management Issues: Large volumes of data can be difficult to manage, analyze, and secure effectively.

A conceptual image showing two business people in suits shaking hands. The background is a blue-toned digital display featuring a glowing world map, various line and bar charts, and a red circular indicator. The overall theme is global business and technology.

3.7

Functional Information Systems and Enterprise Resource Planning Systems (ERPs)



Functional Information Systems (FIS)

- A **Functional Information System (FIS)** supports specific business functions such as **finance, accounting, production, marketing, and human resources**.
- Each department uses its own information system to process and manage department-related information efficiently.

Financial and Accounting Information System (AIS)

- Manages the organization's **financial assets** (cash, stocks, investments) and **financial records** (receipts, payroll, depreciation, etc.).
- Automates routine accounting tasks, reducing manual work and errors.
- Stores financial data electronically and generates accurate financial reports.
- Provides up-to-date financial information to managers for better decision-making.



The essential functions that financial information systems perform includes:

1. Financial forecasting and planning
2. Financial control
3. Fund management
4. Internal auditing

Financial Forecasting and planning

Financial forecasting is the process of **predicting future cash inflows and long-term expenditures** to support financial planning.

Uses **computerized cash-flow models, spreadsheets, and scenario analysis** to estimate future financial performance under different conditions.

Helps organizations determine **how much funding will be required**, where to obtain it, and how to maintain a balance between income and expenses.

Supports strategic decision-making, especially for businesses operating in multiple countries with different currencies.



Financial Control

Financial control ensures that the organization's financial resources are planned, monitored, and used effectively.

Uses budgets to plan income and expenditure over a specific period. Fixed Budget: Remains unchanged regardless of changes in business activity and is suitable for stable organizations.

Flexible Budget: Can be adjusted according to changes in sales, production, or business conditions, making it suitable for dynamic organizations.

Uses spreadsheet software for budget preparation and performance reports to compare actual results with planned budgets.

Applies financial ratios such as Return on Investment (ROI) to evaluate profitability and measure how efficiently company assets are being used.



Funds Management

Funds management focuses on managing the organization's cash and liquid assets to ensure sufficient funds are available for daily operations.

Helps invest surplus funds in cash, securities, or other liquid assets to earn higher returns while minimizing financial risk.

Supports efficient cash flow management by ensuring funds are available when needed.

Some Financial Information Systems can automatically manage investment portfolios and generate buy or sell orders based on market conditions.

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Internal Auditing

Internal auditing provides an **independent evaluation** of the organization's accounting, financial, and operational activities.

Ensures that **financial records are accurate, reliable, and comply with company policies and legal requirements.**

Financial Audit: Examines the accuracy and integrity of financial information and the systems used to process it.

Operational Audit: Evaluates how efficiently management uses company resources and whether organizational plans and objectives are being achieved.

Helps detect errors, prevent fraud, improve internal controls, and enhance overall organizational performance.



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MANUFACTURING AND PRODUCTION INFORMATION SYSTEM



OVERVIEW



The manufacturing and production function is responsible for producing the company's goods and services. It involves planning, developing and maintaining production facilities.

Key activities include acquiring, storing and supplying materials, and scheduling equipment, facilities, materials and labor to achieve production goals. Manufacturing and production information systems support these activities.

AIM



A manufacturing information system is computer based technology that improves the process and efficiency of a manufacturing system, thus increasing the quality of products and minimizing manufacturing costs.

A manufacturing system takes data, material, equipment, management and information systems technology as input and uses manufacturing and information process to generate better final products.

MANUFACTURING SYSTEM INPUTS



MANUFACTURING & INFORMATION PROCESS



Better Final Products

STRUCTURE OF MANUFACTURING INFORMATION SYSTEMS

IT is an important tool in the design and manufacturing processes. Manufacturing information systems is the most difficult to develop and to implement among others.

Transaction Processing Systems (TPSs) are embedded in production or in other company processes. The data provided by the TPS are used by other management subsystems.

MANUFACTURING INFORMATION SUBSYSTEMS



1. Product Design and Engineering

Design and engineering of products supported by CAD/CAE systems.



2. Product Scheduling

Planning and scheduling of resources and production using MRP and CIM.



3. Quality Control

Monitoring and improving quality using data from process control systems and TQM techniques.



4. Facilities Planning, Production Costing, Logistics and Inventory Subsystems

Planning facilities, controlling costs, managing inventory and coordinating logistics and deliveries.

1 PRODUCT DESIGN AND ENGINEERING



- Supported by Computer Aided Design (CAD) and Computer Aided Engineering (CAE) systems.
- CAD systems provide automatic calculations, display of surfaces and store design information in databases.
- Designs are processed with CAE systems to ensure quality, safety, manufacturability and cost.
- CAD/CAE systems reduce manual work and speed up the process.

2 PRODUCT SCHEDULING



- Ensures human, machinery and material resources are available at the right time to produce goods.
- Controlled with a Manufacturing Resource Planning (MRP) system.
- Converts sales forecast into a detailed production plan and into a master production schedule.
- Computer Integrated Manufacturing (CIM) integrates CAD, CAE and shop floor operations with robots and other controlled machinery.

3 QUALITY CONTROL



- Relies on data collected on the shop floor by sensors in process control systems.
- Total Quality Management (TQM) continuously improves performance of all members and units.
- Focus on improving design and process to produce high quality products, not just inspecting defects.

4 FACILITIES PLANNING, PRODUCTION COSTING, LOGISTICS AND INVENTORY SUBSYSTEMS



- Supports higher management in facilities planning decisions.
- Helps locate manufacturing plant sites, decide production capacities and plan plant layouts.
- Manages raw materials, packaging and work-in-progress inventory.
- Inventory management is often combined with logistics systems to control incoming goods and product deliveries to customers.

BENEFITS OF MANUFACTURING INFORMATION SYSTEMS



Improved Efficiency and Productivity



Better Quality Products



Lower Manufacturing Costs



Better Planning and Decision Making



Effective Resource Utilization and Control



Higher Customer Satisfaction



SALES AND MARKETING INFORMATION SYSTEM



OVERVIEW



The **sales and marketing function** is responsible for selling the organization's product or service.



Marketing is mainly concerned with identifying customers, determining what they want, planning and developing products and services according to their needs, and advertising and promoting them.



Sales are concerned with contacting customers, selling products and services, taking orders, and following up on sales.

ROLE OF MARKETING INFORMATION SYSTEM (MIS)

A marketing IS supports managerial activities in:



Product development



Marketing mix



Distribution



Pricing decisions



Promotional effectiveness



Sales forecasting

Marketing IS supports decision making regarding the marketing mix.

MARKETING MIX SUBSYSTEM

This subsystem provides details on product introduction, pricing, promotion (advertising and selling) and distribution.

These decisions are combined into the sales forecast and marketing plans against which ongoing sales results are compared.

MARKETING MIX SUBSYSTEMS INCLUDE:

- 1 Product subsystem
- 2 Place subsystem
- 3 Promotion subsystem
- 4 Price subsystem
- 5 Sales forecasting

MARKETING MIX SUBSYSTEMS – SUPPORTING DECISION MAKING

1 PRODUCT SUBSYSTEM



Helps to plan the introduction of new products. Constantly bringing new products to market is vital in today's competitive environment of rapid change.

Supports the process in several ways:

- Specialized support systems assist designers in their knowledge work.
- DSSs are used to evaluate proposed new products.
- Information derived from marketing intelligence and research to evaluate new product ideas.

2 PLACE SUBSYSTEM



Helps decision makers make the product available to the customer at the right place at the correct time.

Helps to plan distribution channels and track their performance using:

- Bar-coded Universal Product Code (UPC)
- Point-of-sale (POS) scanning
- Electronic Data Interchange (EDI)
- Supports just-in-time product delivery and customized delivery

3 PROMOTION SUBSYSTEM



Supports both selling and advertising to persuade potential purchasers.

- Media selection packages help choose a mix of avenues: direct mail, TV, print media and electronic media such as the Internet and the WEB.
- Effectiveness of the selected media mix is monitored and continually adjusted.
- Database marketing uses extensive databases to identify customers and send personalized promotions.
- Telemarketing uses telephone systems to reach customers, supported by IT.
- Sales force automation provides salespeople with portable computers connected to the company's IS, giving instant access to information and reducing paperwork – increasing selling time and performance.

4 PRICE SUBSYSTEM



Pricing decisions are supported by DSSs that access industry price databases.

- These are highly unstructured decisions made in search of the company's pricing objectives.
- IS provides an opportunity to properly segment customers into groups.
- Different prices can be charged depending on the combination of products and services provided and the situation of the sale transaction.

5 SALES FORECASTING



Based on the planned marketing mix and outstanding orders, sales are forecast and a full marketing plan is developed.

Sales forecasting requires both quantitative methods and human insight & experience as actual sales depend on business environment dynamics.

Techniques used:

- 1 Group decision making techniques are used to get wide expert opinion.
- 2 Scenario analysis in which each scenario represents a likely future environment.
- 3 Extrapolation of trends and cycles through a time-series analysis.

BENEFITS OF AN EFFECTIVE SALES AND MARKETING INFORMATION SYSTEM



Better decision making

Provides accurate and relevant information for informed decisions.



Improved customer satisfaction

Helps deliver the right product to the right customer.



Increased efficiency and productivity

Automates processes and improves coordination across functions.



Higher sales and profitability

Effective marketing mix and forecasting improve sales performance.



Better competitive advantage

Quick response to market changes and customer needs.



Accurate data and information

Reliable data supports planning, control and performance evaluation.



HUMAN RESOURCE INFORMATION SYSTEM (HRIS)



OVERVIEW



Human Resource Information Systems are processes of producing, organizing, storing and distributing employee related information to help decision makers at various levels.



The HR function is responsible for attracting, developing and maintaining the employees.

HRIS support activities such as identifying potential employees, maintaining records of all existing employees and design programs to develop skills. Nowadays, most companies are using HRIS to handle daily human resources activities.

STAKEHOLDERS OF HRIS

A HRIS is available to a variety of internal stakeholders:

-  The employees of the HR department
-  All the employees of the company wants to check their own records
-  All the employees of the company searching information regarding vacancies available, benefit plans
-  Managers throughout the company in the process of evaluating subordinates and making decisions
-  Top level executives involved in taking tactical and strategic decisions

INFORMATION SUBSYSTEMS FOR HUMAN RESOURCE MANAGEMENT

The subsystems of HRIS reflect the flow of human resource functions through the firm, from planning, recruitment to termination. A well-developed HRIS includes the following subsystems:

-  Human resource planning
-  Recruiting and workforce management
-  Compensation and benefits

1 HUMAN RESOURCE PLANNING



To identify the human resources necessary to accomplish the long-term objectives of the company, it needs to plan the skills, knowledge, and experience needed of the future employees.

2 RECRUITING AND WORKFORCE MANAGEMENT



Based on the long term resource plan, a recruitment plan is developed. The plan lists the currently vacant positions and those expected to become vacant due to turnover.



Hiring Promotion Transfer Termination

The life cycle transitions of the company's workforce—hiring, promotion and transfer and termination have to be supported with the appropriate information system.

3 COMPENSATION AND BENEFITS



Two principal external stakeholders have interest in the human resource policies of organizations. Those are,



- Various government authorities.
- Labor unions.

INTEGRATING FUNCTIONAL SYSTEMS FOR SUPERIOR ORGANIZATIONAL PERFORMANCE



Most functional information systems are stand-alone.



As a result, it limits the functions they support and makes it difficult to connect with each other seamlessly.



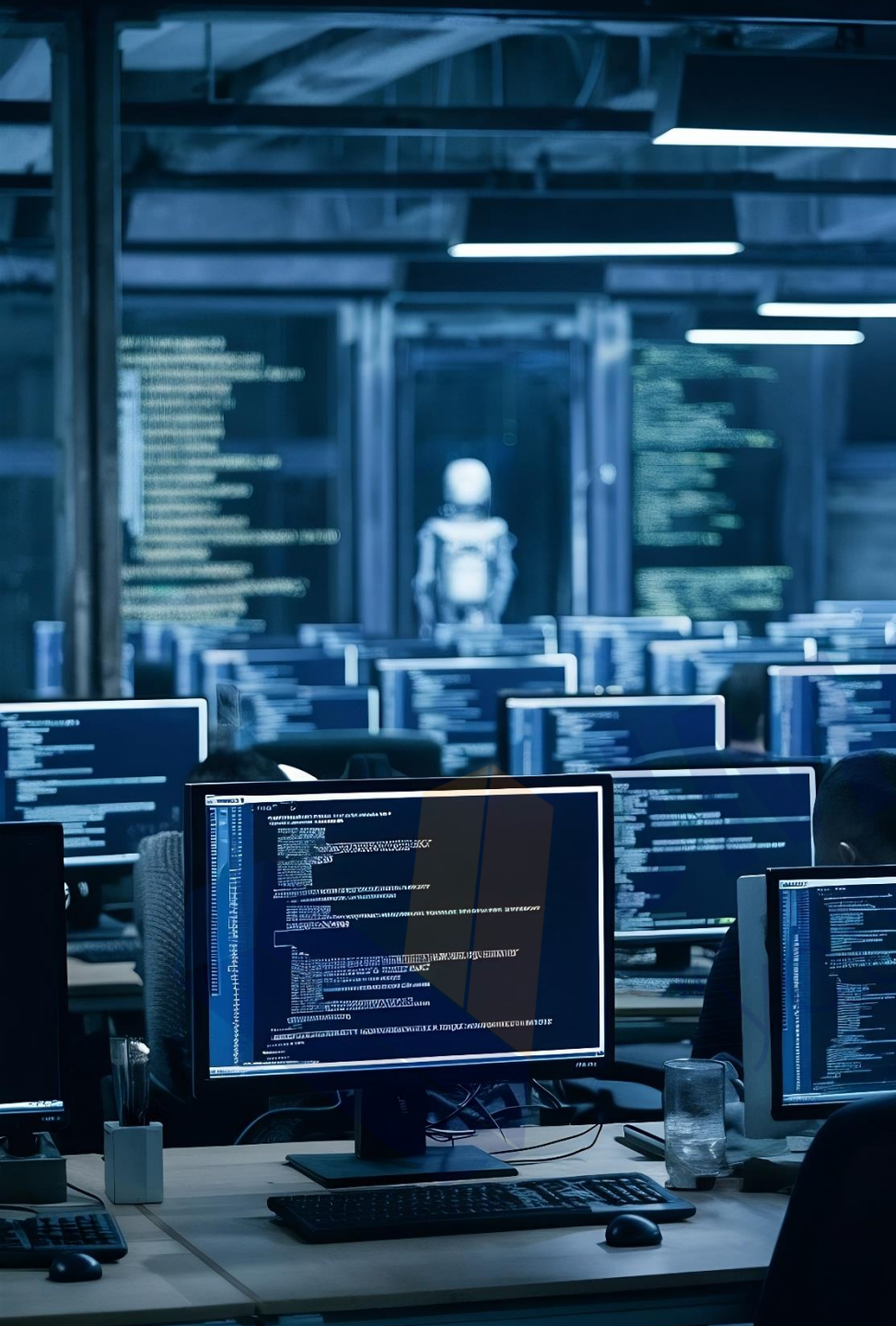
With the support of information technology, internal business processes were integrated.



This reduced across functional gaps and integrated operations with business partners, its customers and suppliers.



ERP: Enterprise Resource Planning



What is ERP?

Enterprise Resource Planning (ERP) is **an integrated information system** that **helps an organization manage and coordinate all of its major business functions** using a single shared database.

ERP **enables different departments within an organization to work together** by sharing accurate and up-to-date information in real time.

ERP **supports the planning and management of an organization's resources**, including people, finances, materials, and information.

Before ERP Systems

Before ERP systems were introduced, organizations used separate information systems for different business functions such as sales, marketing, production, manufacturing, finance, and human resources.

Each department maintained its own database, making it difficult to share information with other departments.



Example of the Problem

When a customer placed an order, the sales department could not immediately determine whether the requested product was available in inventory or needed to be manufactured.

As a result, customers often experienced delays because information had to be collected from different departments before a response could be given.



ERP software offered by different software companies and following are few among them.

ERP Software	ERP Software Vendor
SAP R/3	SAP
Oracle manufacturing	Oracle
PeopleSoft	PeopleSoft
iRenaissance	Ross Systems
MFG/Pro	QAD
Triton	Baan



Why ERP is important

ERP manages a number of business functions through streamlining and automating routine business operations.

The software creates accurate operation and provides a comprehensive, overall view of a business.

With ERP software, businesses are able to improve both user efficiency and productivity, as well as customer service.



Advantages of ERP

Competitive advantage

ERP software helps to keep business ahead of the competition because business no longer run the risk of making costly mistakes, which could place company behind the others.

Companies cannot afford not to have an ERP in their organization, while their competitors invest in ERP and starts securing many benefits.

Improved process efficiency

An ERP solution eliminates repetitive processes and greatly reduces the need to manually enter information repeatedly.

This will not only improves productivity, but it eliminates the possibility of human errors which could lead to costly business mistakes.

Think of ERP as an extra hand and brain, designed to keep businesses on track.



Advantages of ERP

Accurate forecasting

This helps users and businesses as a whole, think ahead and properly plan activities sales to financials and even customer services.

With stronger forecasting facilities, businesses can effectively decrease business costs.

Since the information within ERP is as accurate, up-to-date, businesses can make realistic estimates and more effective forecasts.

Department collaboration

Collaboration between departments is a crucial and often necessary part of the business, especially because business functions often involve more than just one department.

With the data entered into ERP systems being centralized and consistent, all departments can work together, sharing same information and collaborating whenever it is needed.

Advantages of ERP

Scalable resource

No matter how big or small business is, ERP grows with it, being able to occupy new users and data whenever the business needs to expand.

ERPs facilitates the growth of the business by accommodating new data and information within the system rather than need for a new system.

Integrated information

ERP software acts as a central access point (with a unified database) for all of the important information that the business and other the departments maintain daily business practices and operations.

No more issues with data spread across multiple databases, all information will be housed in a single location.

This means company can integrate platforms like CRM software with the ERP system, keeping data consistent, accurate and unique.





Advantages of ERP

Cost Savings

With single source of accurate, real-time information, enterprise resource planning software reduces administrative, and operations costs, allows businesses to utilize money in other needed areas.

It allows manufacturers to proactively manage operations, prevents disruptions and delays, breaks up information deadlocks and helps users make decisions more quickly.

Streamlined processes

For example, manufacturing module automates business operations across-departmentally, providing accurate, real-time information to everyone, while eliminating manual duty, possibly leads to errors.

ERP increases efficiency and productivity by automating complex processes, preventing data re-entry and improving functions such as production, order completion and delivery.

