

Information Systems

Prepared by Dr. Amjad Qtaish

IT372
Information Systems

Lecture 06



Module 3: Business Information Systems



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Chapter 10: Information and Decision Support Systems
Chapter 11: Knowledge Management

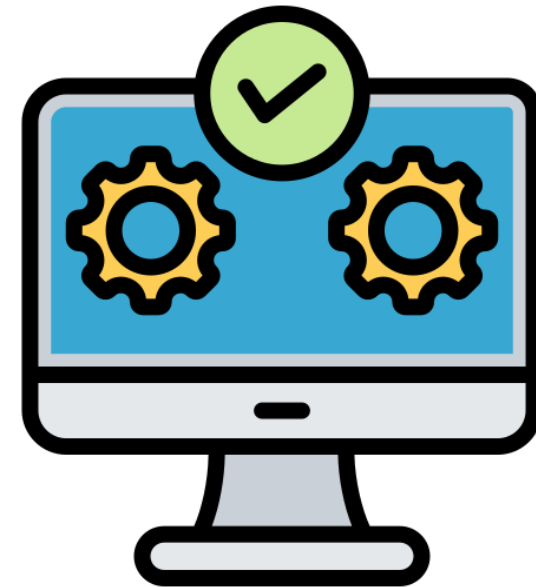


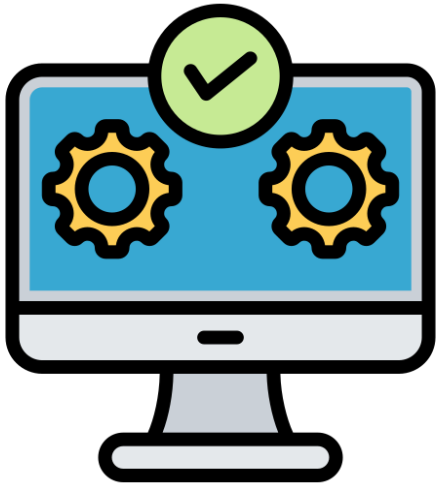
Information Systems (IT372)



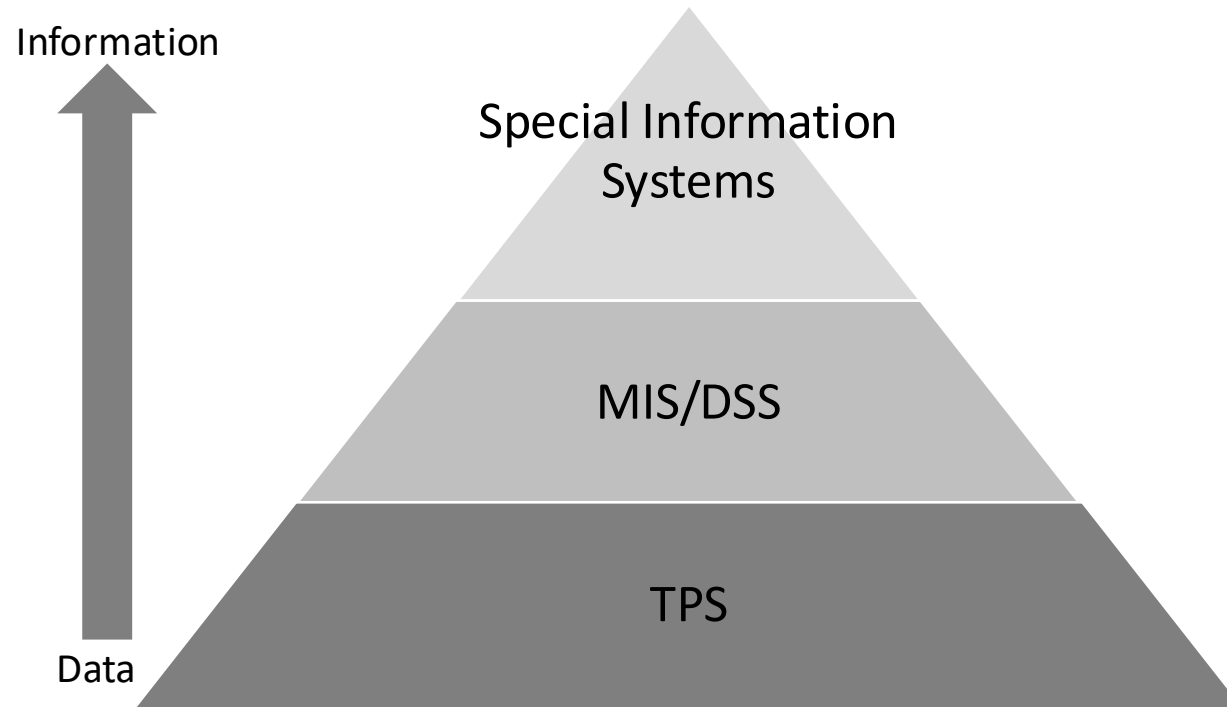
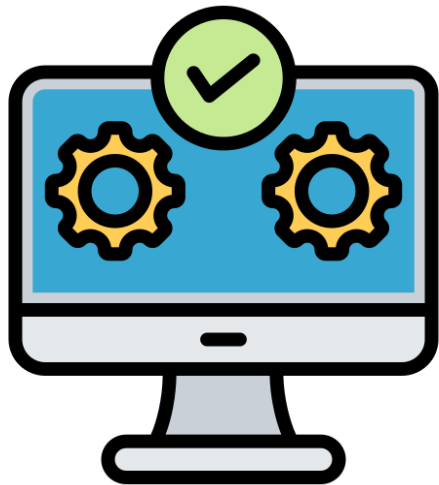
Business Information Systems:

- Transaction Processing Systems, Methods, Objectives, Activities, Applications
- Overview of Management Information Systems
- Characteristics of MIS
- Functional Aspects of MIS
- Types of Decisions
- Decision Making Process
- Decision Making Approaches
- Dimensions of Knowledge
- Overview of Knowledge Management Systems
- Types of Knowledge Management Systems



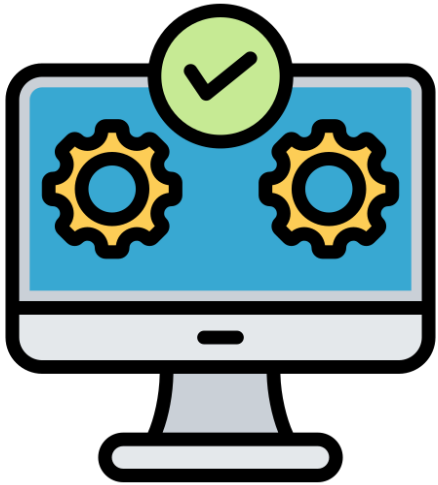


- **Used to capture and process the detailed data necessary to update records about fundamental business operations in the organization**
 - Order entry, inventory control, payroll, accounts payable, accounts receivable
- **Serves as the foundation of all other special purpose systems e.g. MIS/DSS**
- **Processing Activities**
 - Data collection
 - Data editing
 - Data correction
 - Data manipulation
 - Data storage
 - Document production





Transaction Processing Methods and Objectives



- **Batch Processing**

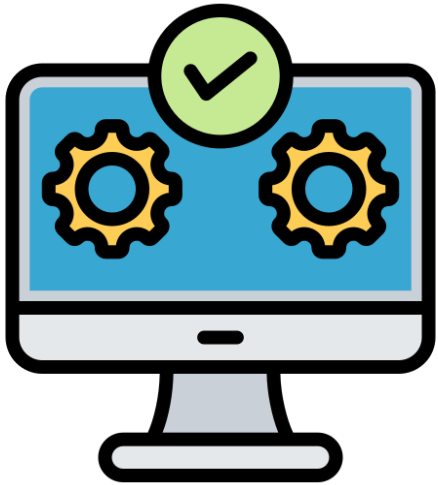
- business transactions are accumulated over a period of time, and then accumulated as a single batch
 - Daily, weekly, biweekly
- Some delay between an event and the eventual processing of the related transaction

- **Online Transaction Processing (OLTP)**

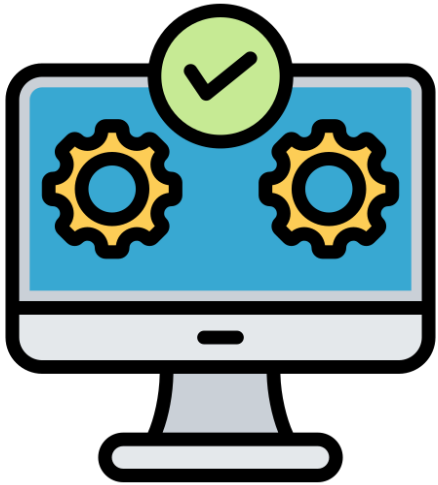
- Transaction is processed immediately
- Essential for businesses that require current, up-to date data
 - Airlines, ticket agencies, investment firms
- Faster, more efficient
- Many companies use Internet to capture & process transaction data such as customer orders and shipping info from e-commerce application.



Transaction Processing Methods and Objectives



- Process data by and about transactions
- Maintain a high degree of accuracy and integrity
- Avoid processing fraudulent transactions
- Produce timely user responses and reports
- Increase labor efficiency
- Help improve customer service
- Help built and maintain customer loyalty
- Achieve competitive advantage

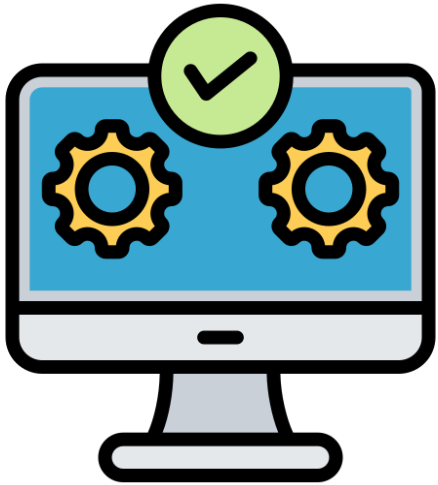


- **Data Collection**

- Sometimes done manually, collecting handwritten sales data/ inventory changes
- At times automated through devices such as scanners /terminals, POS
- Source data automation: data captured at source, in digital form in timely manner
 - Through UPC codes or RFID tags
 - Product ID automatically determined; price retrieved from database
 - Inventory database updated and reports generated for the store manager to recorder the supply

- **Data Editing**

- Checking the data for validity and completeness
- Codes are checked against already stored codes

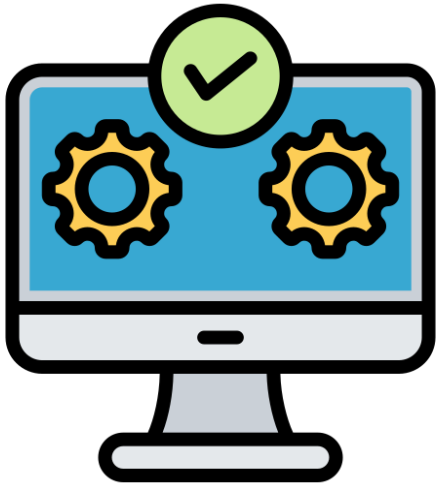


- **Data Correction**

- Re-entering data that was not scanned or typed properly
- Error messages are generated to specify problem so proper corrections can be made
- Some companies have Data Quality centers, to improve and maintain data

- **Data Manipulation**

- Process of performing calculations and other data transformations
- Classifying data, storing data in categories, calculations, summarizing results, storing data

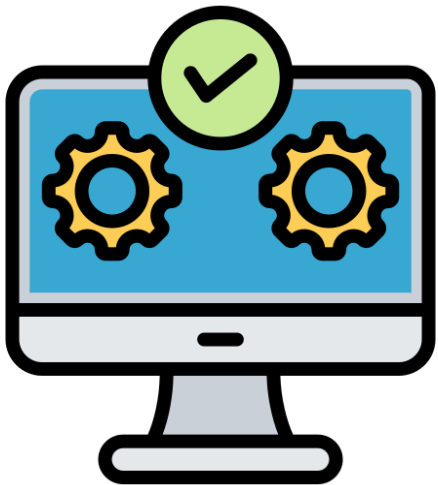


- **Data Storage**

- Updating one or more databases with new transactions
- Afterwards data is available for processing and further manipulations
- also available for reporting and decision making

- **Document Production**

- Generating output records, documents, reports
- Hard copy (pay check) or soft copy (balance report)
- Also provide useful management information and decision support
- In addition, provide reports needed by local, state or government agencies



Order Processing

- Order processing
- Sales configuration
- Shipment planning
- Shipment execution
- Inventory control
- Accounts receivable

Purchasing

- Inventory control (raw material, packing material, spare parts, supplies)
- Purchase order supplies
- Receiving
- Accounts payable

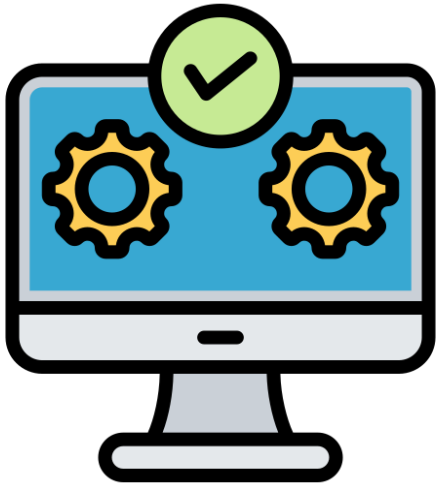
Accounting

- Budget
- Accounts receivable
- Payroll
- Asset management
- General Ledger

Systems that support order processing, purchasing and accounting function for traditional TPS



Overview of Management Information Systems



- **Integrated collection of people, procedures, databases and devices that provides managers and decision makers to help achieve organizational goals**
 - Right information to the right people, in the right format at the right time
- **Provides managers with insight into regular operations**
 - Control, organize and plan
 - E.g: summarizing profit and losses
 - E.g. generating sales activity report



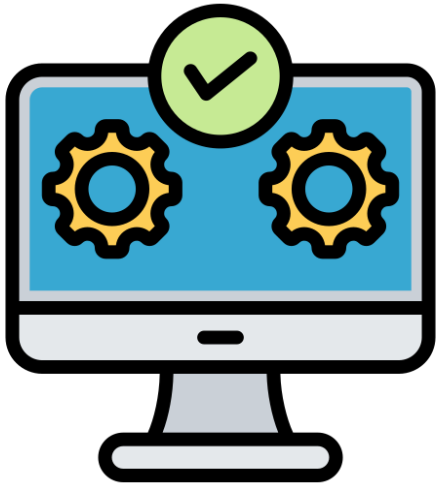
- **Inputs to a MIS**

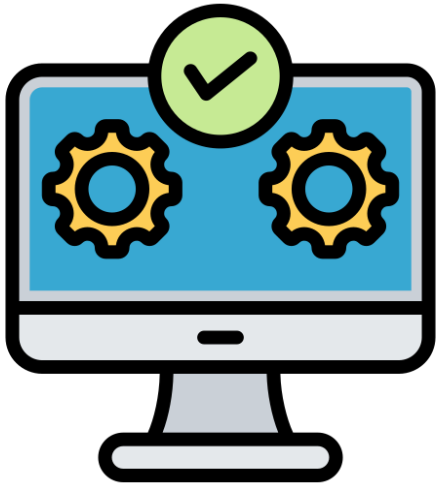
- **Internal:**

- TPS and ERP systems
 - Company's supply chain
 - Data warehouses/ data marts
 - Specific functional areas

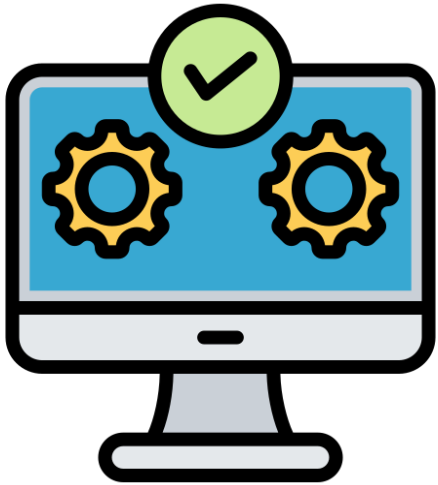
- **External:**

- Customers, suppliers, stakeholders
 - Through Internet or extranet link

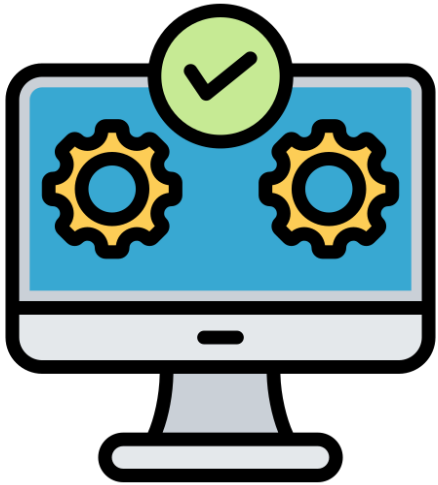




- **Scheduled Reports**
 - Periodic. E.g. report once per day to monitor production of new item
- **Key-indicator reports**
 - Summarizes pervious day critical activities
- **Demand reports**
 - E.g. executive wants to know status of a certain item, so request database
- **Exception Reports**
 - Generated when situation unusual or requires management action
- **Drill Down Reports**
 - Get detailed data about a certain situation



- Providing reports with fixed and standard formats
- Produce hard copy and soft copy reports
- Use internal data stored in the computer systems
- Allow users to develop their own custom reports
- Require user request for reports developed by systems personnel

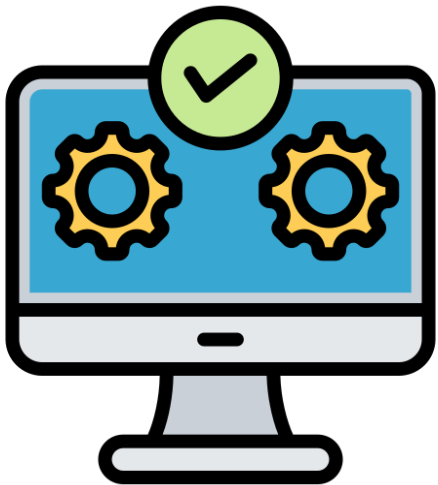


- **Financial MIS**

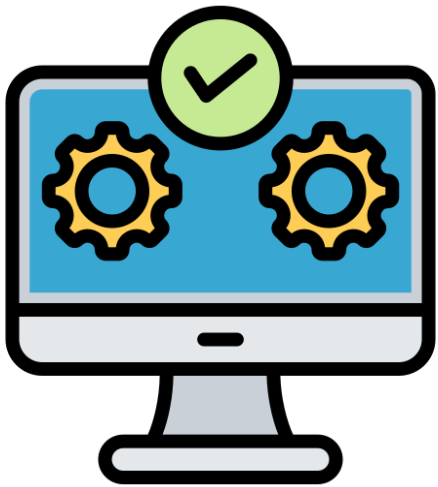
- Provides financial info to executives plus decision makers
- Functions of Financial MIS include:
 - Integrating financial and operational information
 - Providing easy access to financial data & information
 - Make financial data immediately available
 - Allows multidimensional analysis of financial data (time, plant, product etc)
 - Analyzing historical and current financial activity

- **Subsystems of financial MIS**

- **Profit/loss and cost systems:** these systems are used to compute the revenues, profits and costs from:
 - Profit centers
 - Revenue centers
 - Cost centers



- **Auditing:** these systems are used in all aspects of internal and external auditing, also checking whether financial statements and reports produced by financial MIS are accurate
- **Uses and management of funds:** these systems help in using the funds internally, such as purchasing inventory, updating equipment, hiring employees etc. and externally such as investments in other revenue generators

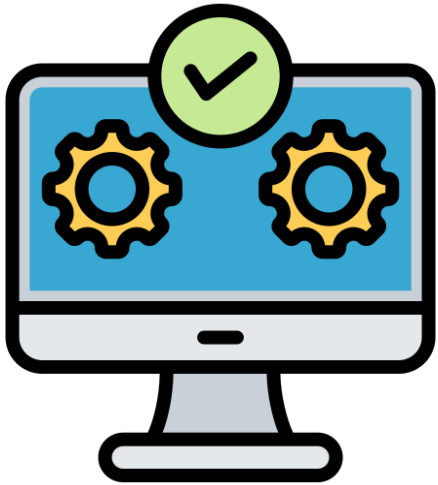


- **Manufacturing MIS**

- Manufacturing has dramatically improved because of IS
- MIS subsystems and outputs monitor and control the flow of materials, products and services through the organization
- MIS monitors the whole process of transforming raw materials to finished goods
- E.g. auto manufacturers

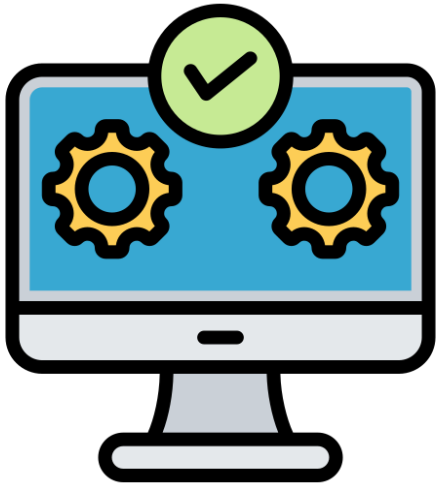
- **Manufacturing MIS subsystems include:**

- Design and Engineering
 - Use computer-aided design with new or existing products
 - Blue print created and constantly revised
 - Results in reduction of manufacturing costs



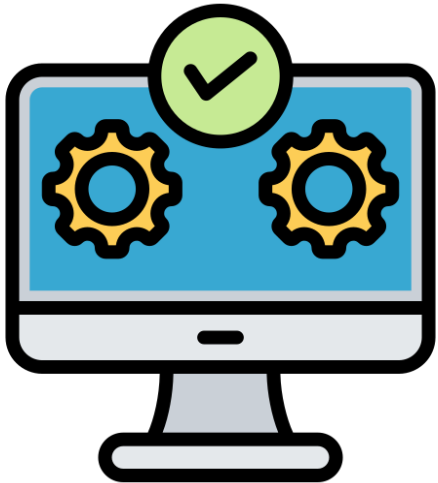
- **Manufacturing MIS**

- Master Production scheduling and inventory control
 - Provides detailed plans for both short-term and long range of scheduling manufacturing facilities
 - Economic order quantity (EOQ), Materials requirement Planning (MRP),
 - Just-in Time Inventory
- Process Control
 - Managers use technologies to control and streamline manufacturing process
 - Computer assisted manufacturing (CAM)
 - Computer Integrated manufacturing (CIM)
- Quality control and Testing
 - A process that ensures that the finished product meets the customer's needs
 - IS are used to monitor quality and take corrective steps to eliminate quality issues



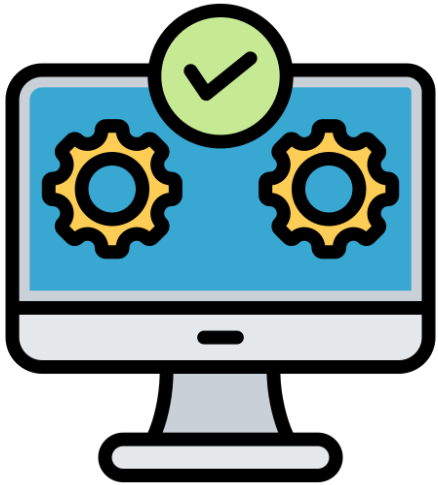
- **Marketing MIS**

- Supports managerial activities in product development, distribution, pricing decisions, promotional effectiveness and sales forecasting
- Different subsystems help the managers increase sales, reduce marketing expenses and develop plans for future product & services
- Market research
 - Computers used to help analyze the results of research
- Product Development
 - Computers help to analyze and select the appropriate mix of factors involved
- Promotion and advertising
 - Internet used to promotions and advertising
- Product pricing
 - Computers used to analyze pricing and revenues
- Sales analysis
 - Computers can be used to give sales analysis from different dimensions



• Human Resource MIS

- Concerned with previous, current, future employees
- Helps in workforce analysis, planning, hiring, training, job assignment
- Thus, keep the workforce costs to minimum
- HR planning
 - Right no. and kind of employee in right jobs
 - Planning workforce needs and supplies
- Selection and recruiting
 - Through internet and resume templates
- Training and skills
 - Help in evaluating and testing employees
- Salary administration
- Scheduling and Job placement



- **Structured decisions**

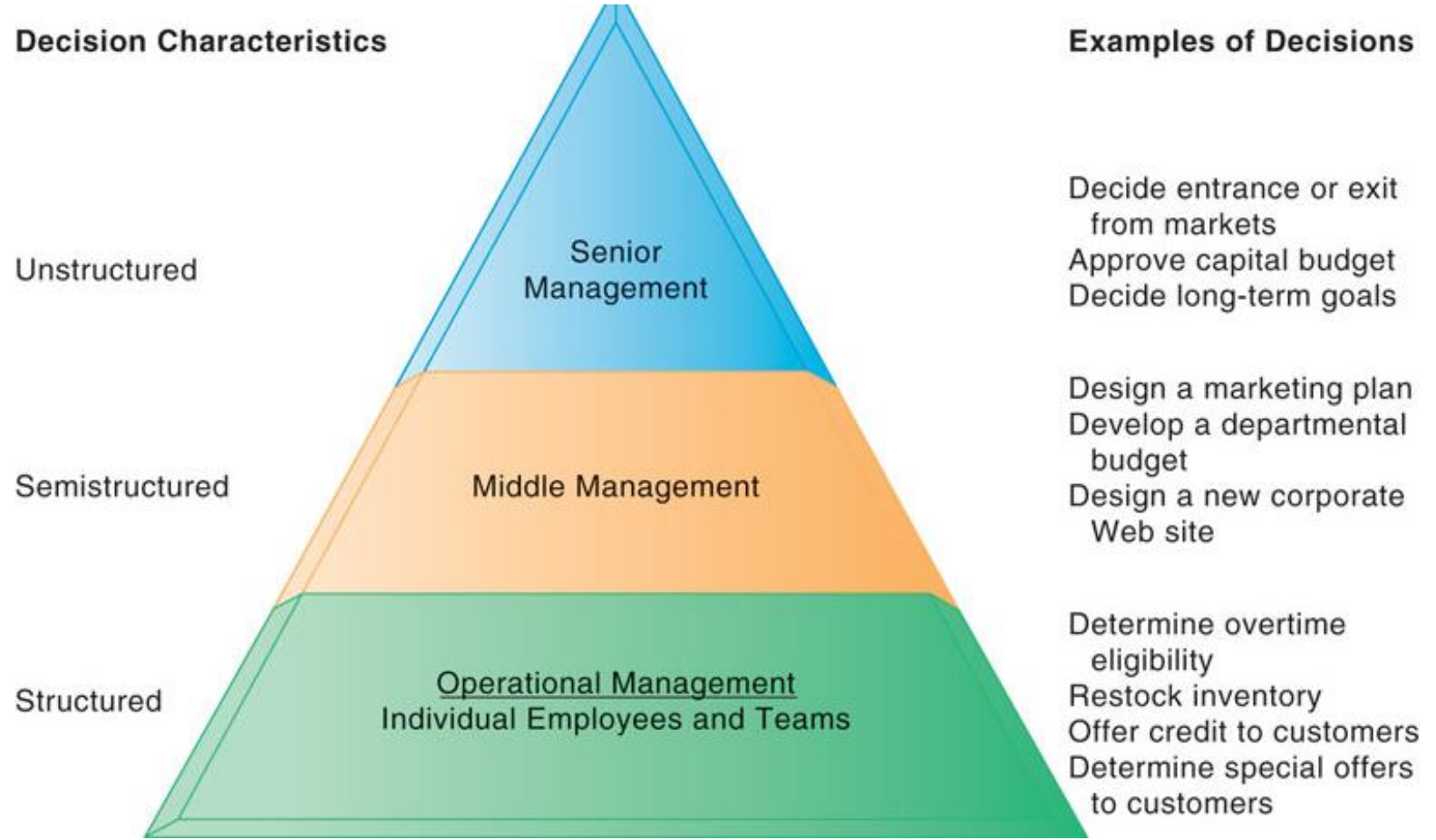
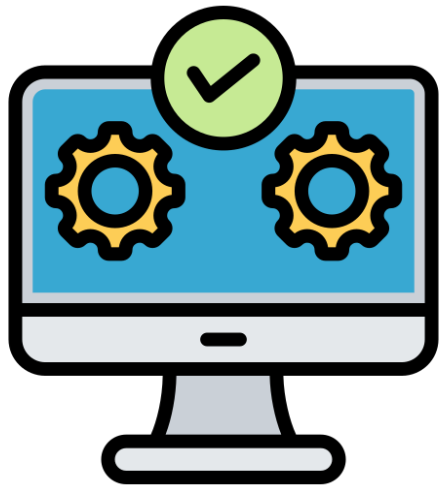
- Repetitive and routine
- Definite procedures for handling problems
- Question: is some employee entitled to overtime pay?

- **Unstructured decisions**

- Decision maker must provide judgement, evaluation and insight
- Decisions are novel, important and non-routine
- Question: should we enter a new market?

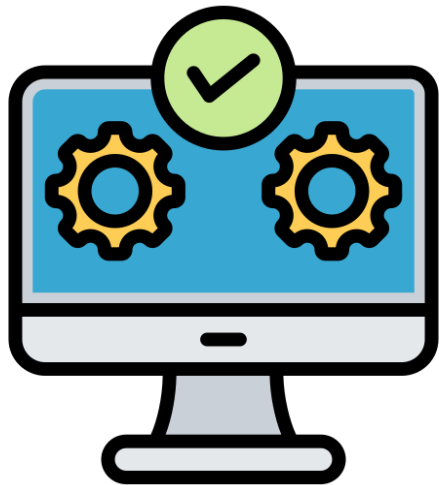
- **Semistructured decisions**

- Have elements of both types of decisions
- Part of the problem has a clear cut answer
- Question: Why is the reported order fulfilment report showing a decline over a past six months?





Decision Making Process

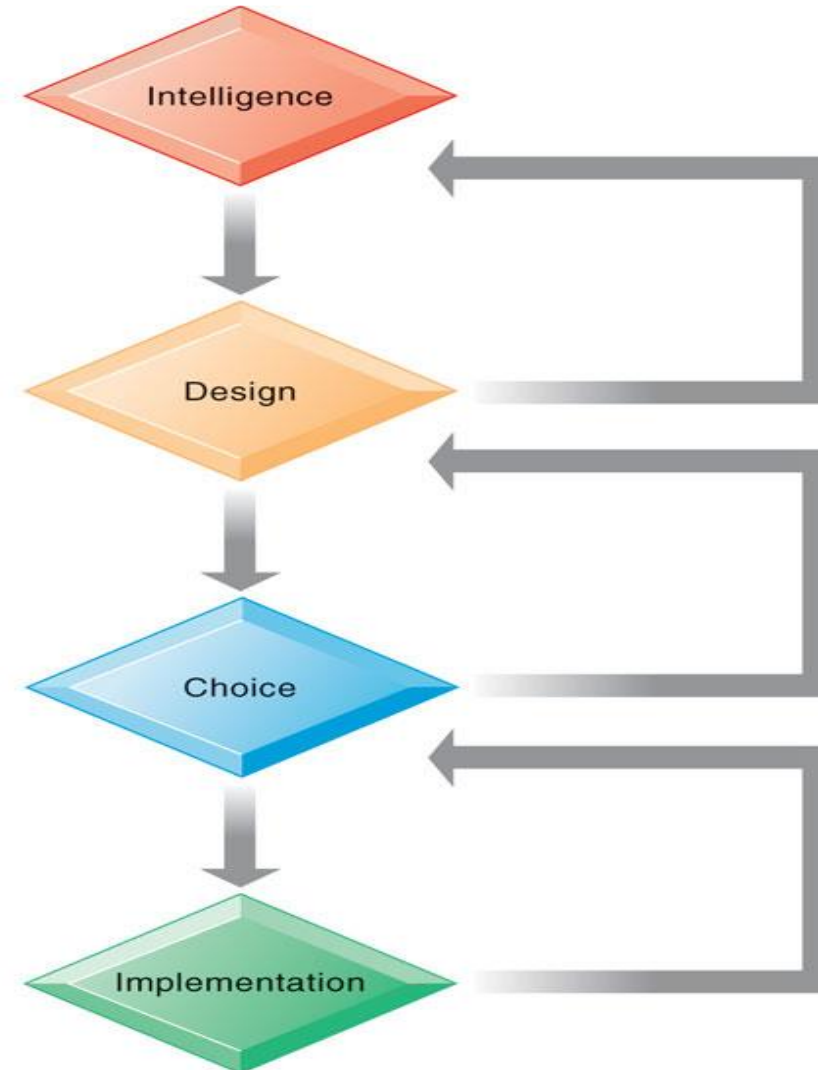


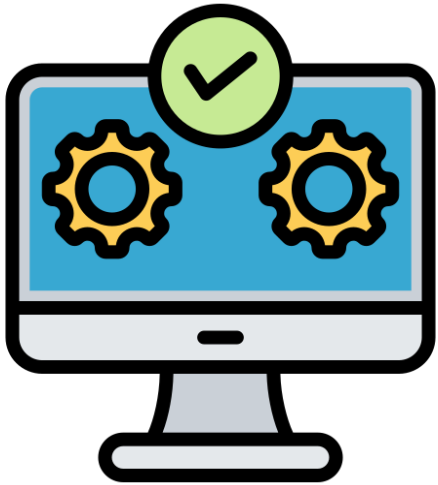
Problem discovery:
What is the problem?

Solution discovery:
What are the possible solutions?

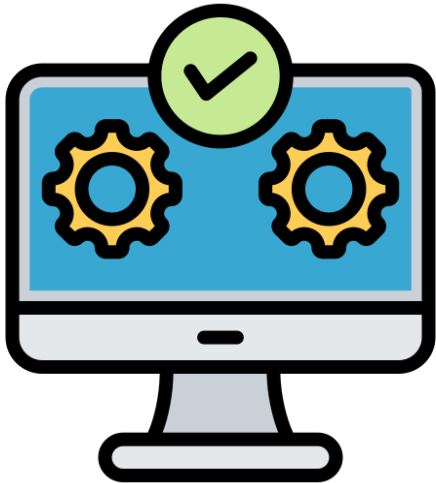
Choosing solutions:
What is the best solution?

Solution testing:
Is the solution working?
Can we make it work better?

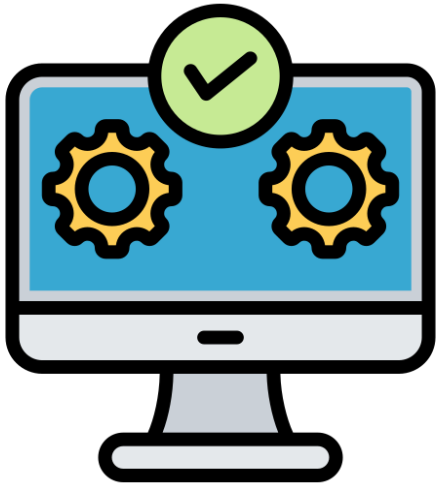




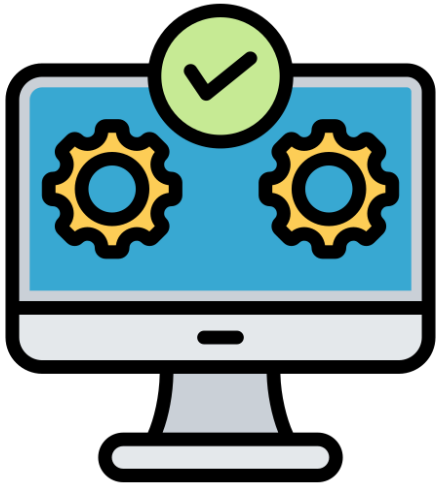
- **Intelligence**
 - Discovering, identifying and understanding the problem
 - Why, what, where
- **Design**
 - Identifying and exploring various solutions to the problem
- **Choice**
 - Choosing among the different alternatives
- **Implementation**
 - Making the chosen alternative work
- **Monitoring**
 - Evaluate the implementation, whether anticipated results are achieved



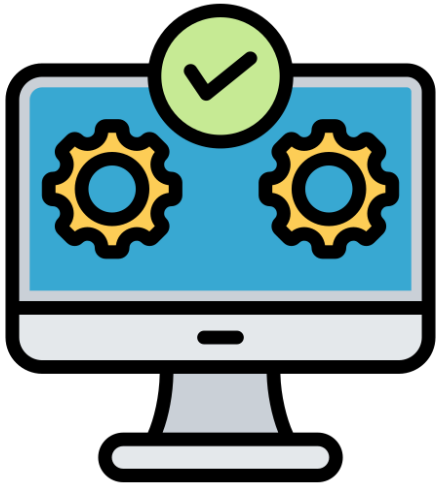
- **Optimization**
 - Finds the best solution, helping the organizations meet the goals
- **Satisficing**
 - Finds a good, but not necessarily the best solution
- **Heuristics**
 - Rules of thumb
 - Accepted guidelines and procedures to find a good solution



- **Data:** flow of transactions (raw facts) captured by the system
- **Information:** collection of facts organized so that they have value beyond the value of facts themselves
- **Knowledge:** is the awareness and understanding of a set of information and the ways that information can be made useful to support a specific task or reach a decision
 - **Tacit:** knowledge residing in minds of employees that is not documented
 - **Explicit:** knowledge that has been documented (structured /unstructured)



- **Knowledge is a Firm asset**
 - Intangible asset
- **Knowledge has different forms**
 - Tacit, explicit, know-how, craft, skill, following procedures, knowing 'why'
- **Knowledge has a location**
 - Cognitive event, individual attribute and collective attribute, 'sticky'
- **Knowledge is situational**
 - know when to apply some procedure (conditional) and works in certain situations (contextual)
- Knowing how to do things efficiently is a primary source of profit and competitive advantage

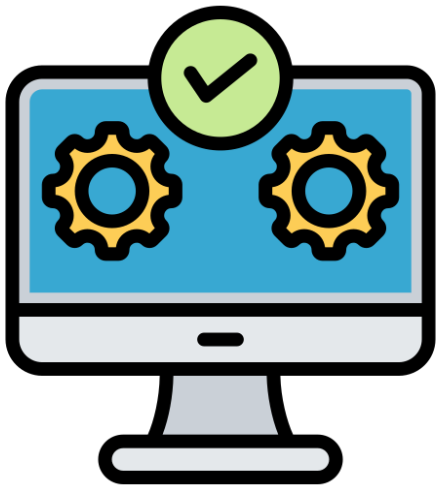


- **Knowledge Management**

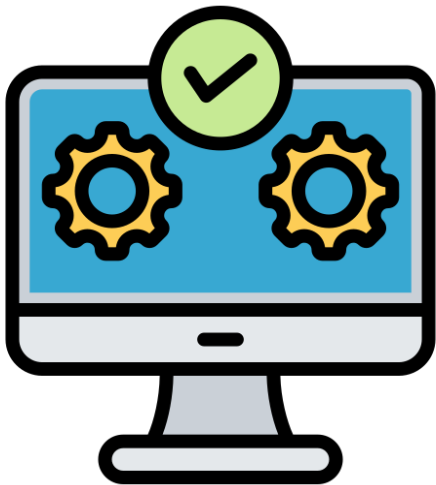
- Refers to set of business processes developed in an organization to create, store, transfer and apply knowledge

- **Knowledge Management System**

- Organized collection of people, procedures, software, databases and devices used to create, store, share and use the organization's knowledge and experience
- These also help organizations achieve their goals
- **Knowledge worker:** create, use and disseminate knowledge
 - professionals in science, engineering, business
- **Chief Knowledge Officer:** top-level executive who overlooks work related to KMS



- **Organizations create and gather knowledge using a variety of organizational learning mechanisms**
- **Organizational Learning:**
 - When organizations gain experience, they adjust their behaviour to reflect that learning by creating new business processes and changing patterns of decision making
- **Communities of Practice (COP):**
 - Informal social networks of professionals and employees within and outside the firm who have similar work-related activities and interests
 - Some organizations create , store, share knowledge through COPs
 - Allow easier reuse of knowledge, by pointing community members to useful documents

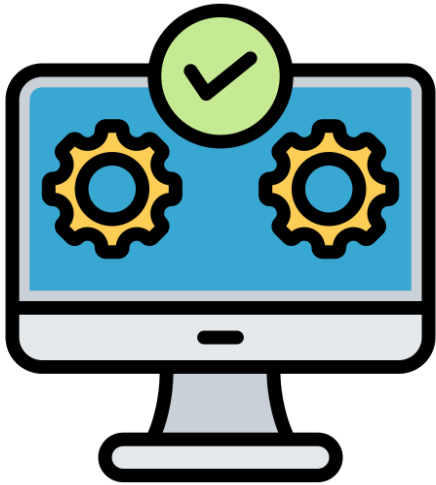


- **Knowledge Acquisition/Creation**

- Initially used to corporate repositories of documents, reports, presentations
- Then started to include unstructured documents (e-mails)
- Develop online expert networks
- Create knowledge by discovering patterns in corporate data

- **Knowledge Storage**

- Documents, patterns and expert rules stored usually in database
- Document management systems, Expert systems
- Orgs need planned management storage systems, and reward employees for taking time to update and store information

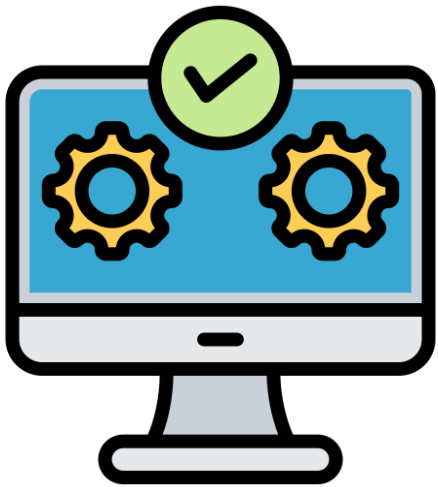


- **Knowledge Dissemination**

- Contemporary technologies have helps in the dissemination of knowledge
- Also training programs, informal networks, and shared management experience

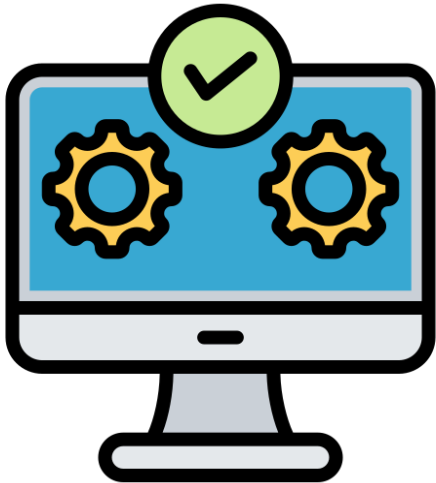
- **Knowledge Usage/Application**

- Organizational knowledge must become a systematic part of management decision making as well as DSS
- Also utilized in enterprise applications for managing key business processes and relationship with customers/suppliers
- Create new processes, products, services



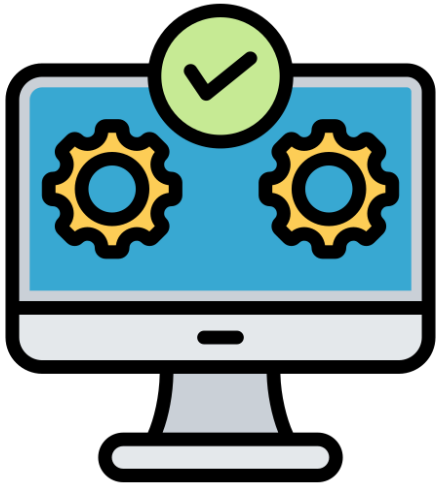
- **Enterprise Wide Knowledge Management Systems**

- General purpose enterprise-wide efforts collect, store, distribute and apply digital content and knowledge
- **Content Management Systems (CMS):** stores both structured as well as unstructured knowledge
 - Includes computer repositories of documents, presentations, best practices
 - For easy retrieval, organize info into meaningful categories and then each object is classified
 - Benefit: reduces time to search for relevant docs
- **Knowledge Network Systems:** used when knowledge is not in the form of digital documents
 - Provides online directory of corporate experts in well defined knowledge domains
 - Use communication technologies to get linked to experts



- **Enterprise Wide Knowledge Management Systems**

- **LMS:** provide tools for management, delivery, tracking, assessment of various types of learning and training
 - Automates selection & administration of courses, group learning in online forums
- **Collaboration tools:** blogs and wikis also used for collaboration along with other vendor given collaboration software
 - Help capture, consolidate & centralize knowledge for the firm



- **Knowledge Work Systems**

- Specialized systems built for engineers, scientists & other knowledge workers charged with discovering & creating new knowledge for the company
- **CAD and 3D:** automates creation and revision of designs using computers & sophisticated graphics software
 - Design easily tested and changed on computer
- **Virtual Reality:** have visualization, rendering, and simulation capabilities.
 - Interactive graphic software to create computer generated simulations close to reality
 - Augmented Reality: enhances visualization by augmenting real physical-world environment



Thank You