

Information Systems

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IT372
Information Systems

Lecture 07



Module 4: Systems Development



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Chapter 13: Investigation and Analysis

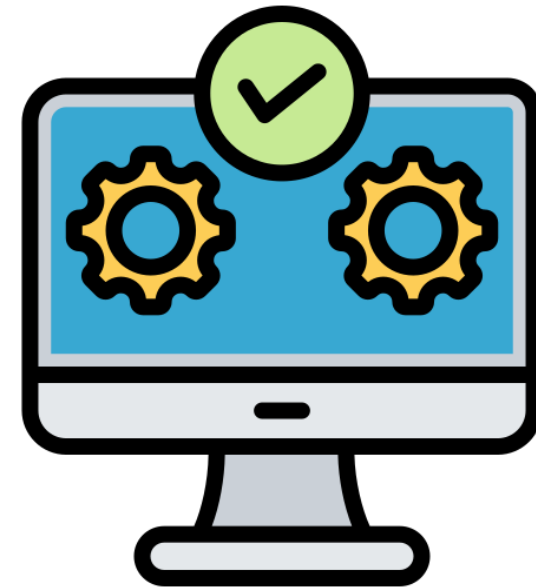


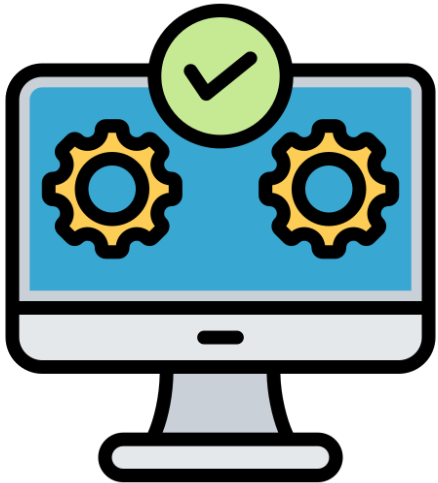
Information Systems (IT372)



Business Information Systems:

- Participants of Systems Development
- Initiating Systems Development
- Information Systems Planning and Aligning Corporate & IS goals
- Establishing Objectives for Systems Development
- Systems Development Lifecycles
- Outsourcing and On-demand Computing
- Factors Affecting Systems Development Success
- Systems Investigation
- Systems Analysis



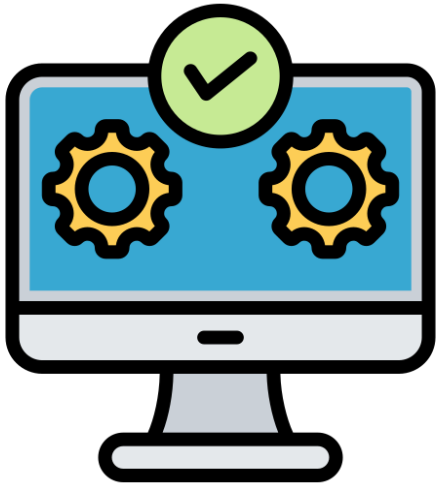


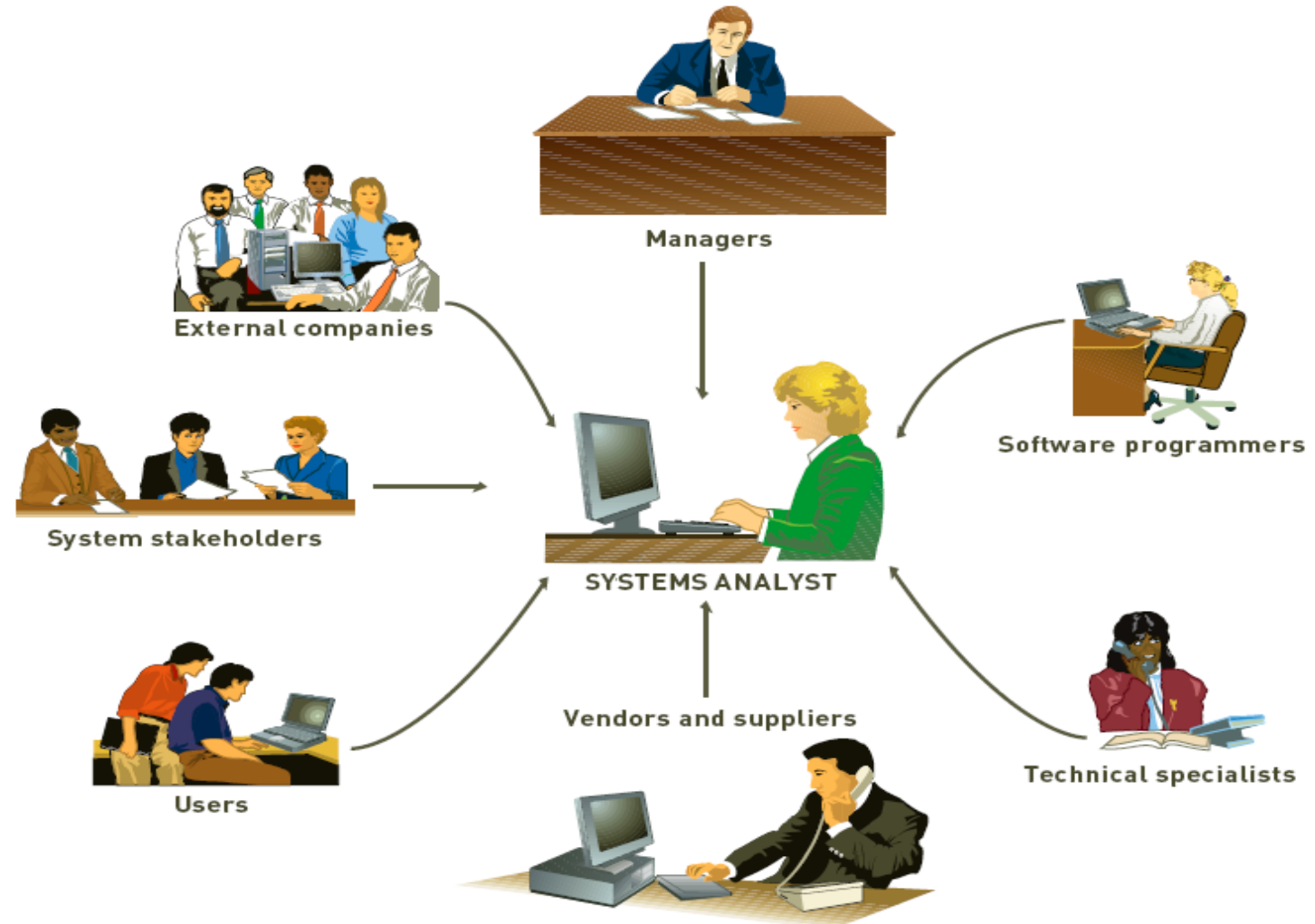
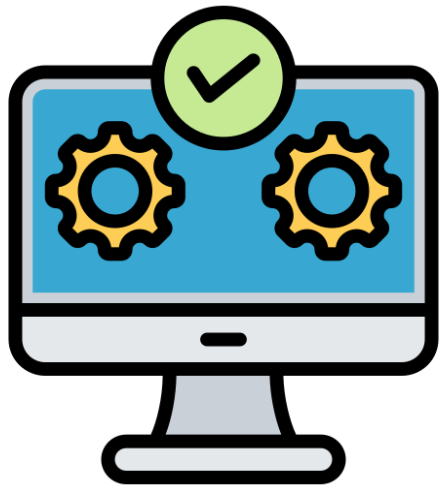
- **Development team**
 - Determines objectives of the information system
 - Delivers system that meets objectives
- **Project**
 - Planned collection of activities that achieves a goal
- **Project manager**
 - Responsible for coordinating all people and resources needed to complete a project on time
- **Stakeholders**
 - People who ultimately benefit from project
- **Users**
 - People who will interact with the system regularly

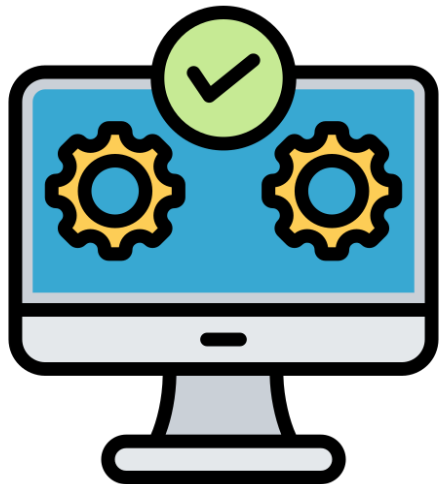


- **Systems development specialists**

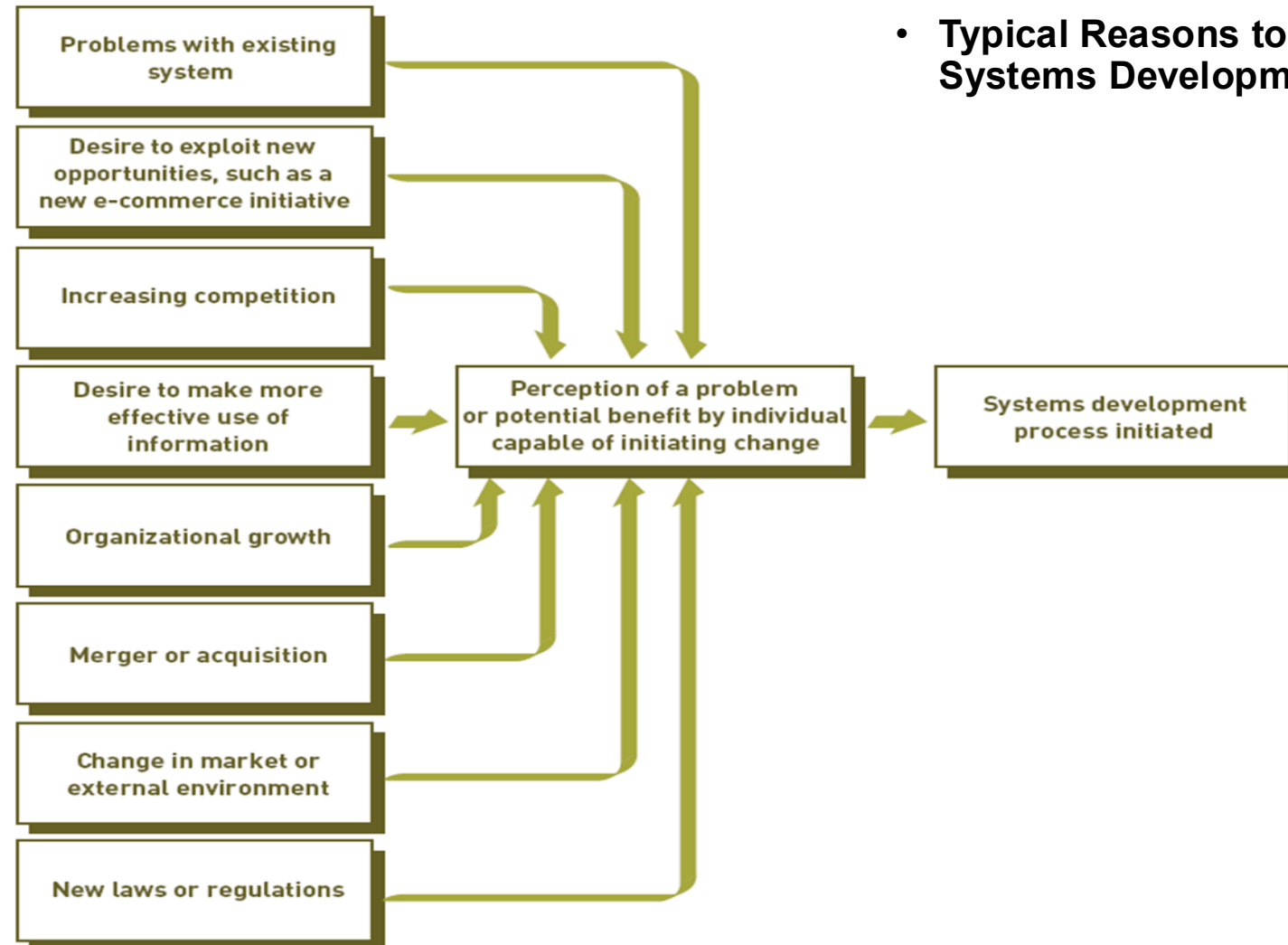
- **Systems analysts:** professionals who specialize in analysing and designing business systems
- **Programmers:** responsible for modifying or developing programs to satisfy user requirements

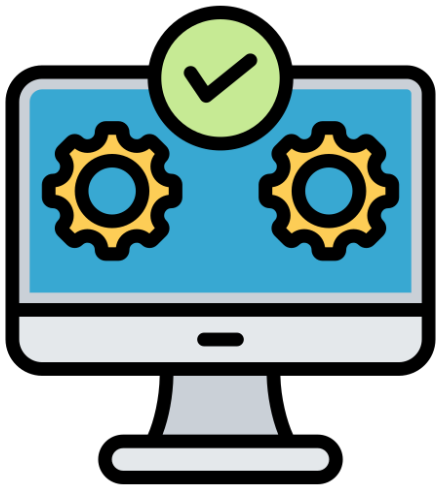




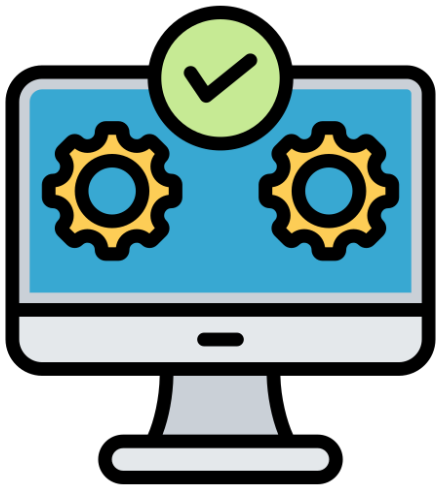


- Typical Reasons to Initiate Systems Development

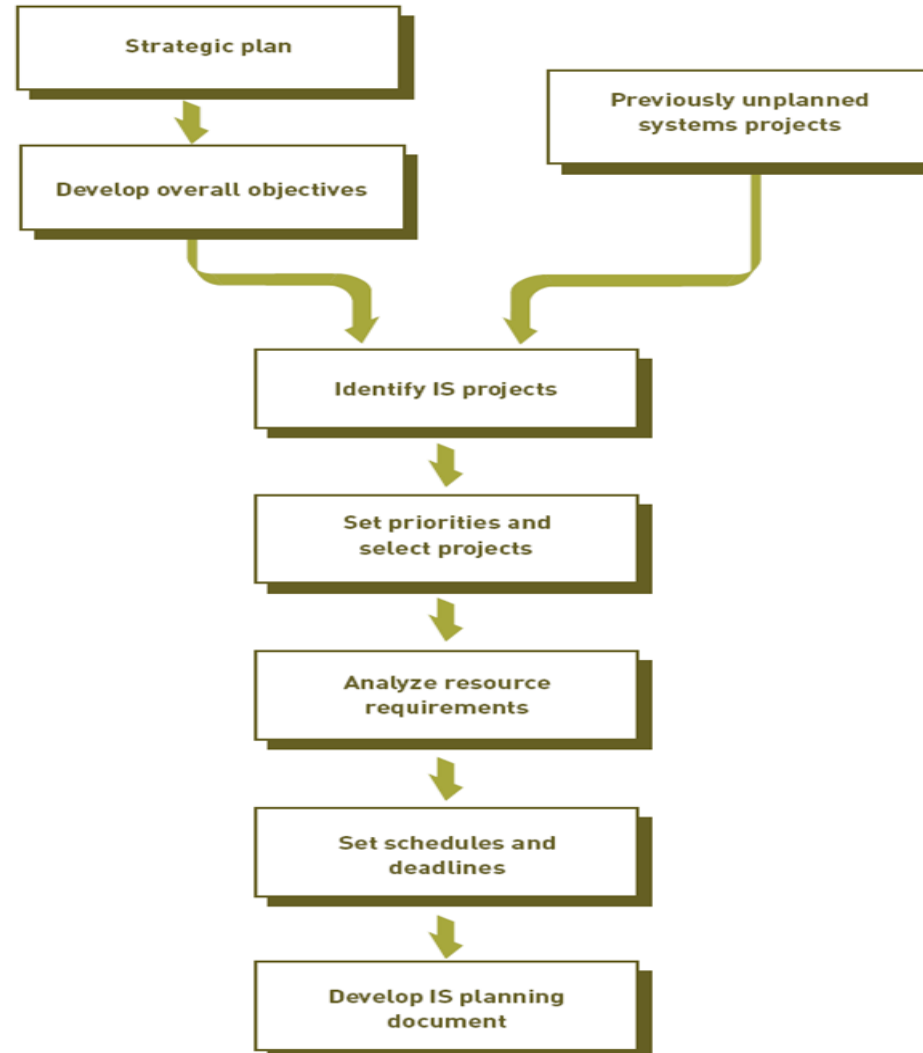
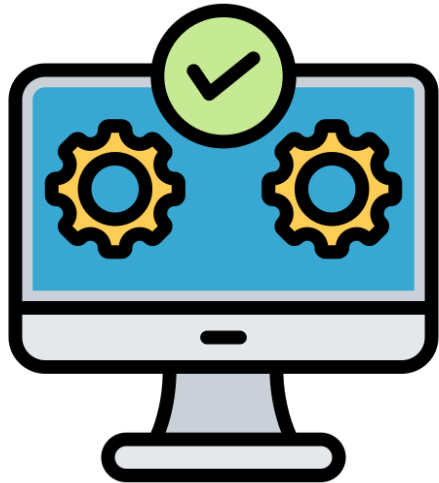


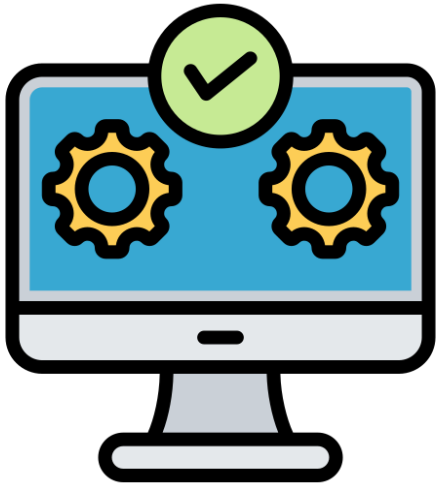


- **Systems development initiatives**
 - Arise from all levels of an organization
 - Can be planned or unplanned
- **Number of reasons for initiating systems development projects**
 - Mergers, acquisitions, federal regulations, etc.



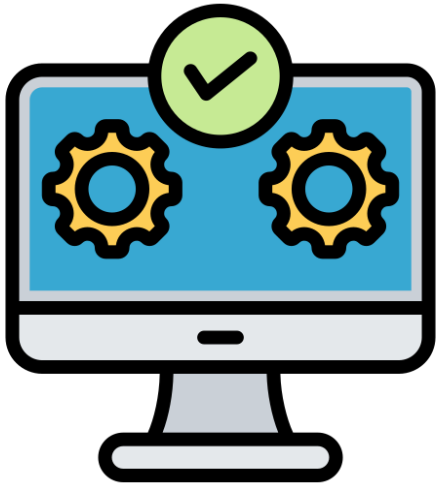
- **Information systems planning**
 - Translating strategic and organizational goals into systems development initiatives
- **Aligning organizational goals and IS goals**
 - Critical for successful systems development effort
 - This gives a long-range view of IS used in the organization
 - Also allows better use of IS resources (funds, personnel and time)



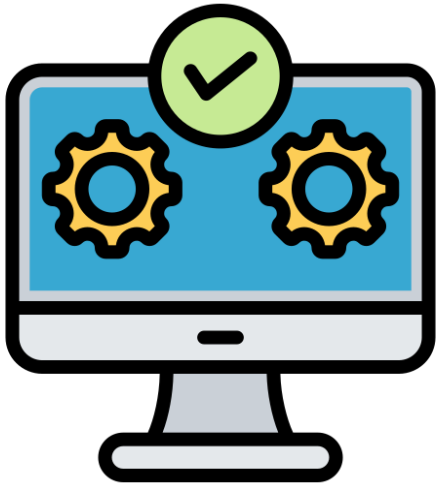


- **Developing a Competitive Advantages**

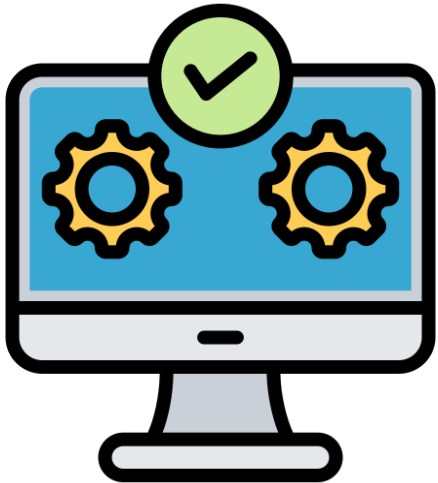
- IS project are there to achieve competitive advantage
- Creative Analysis
 - Investigating new approaches to existing problems
- Critical Analysis
 - Unbiased and careful questioning to see if system elements are related in the most effective ways
 - Questioning statements and assumptions
 - Identifying and resolving objectives and orientations that conflict



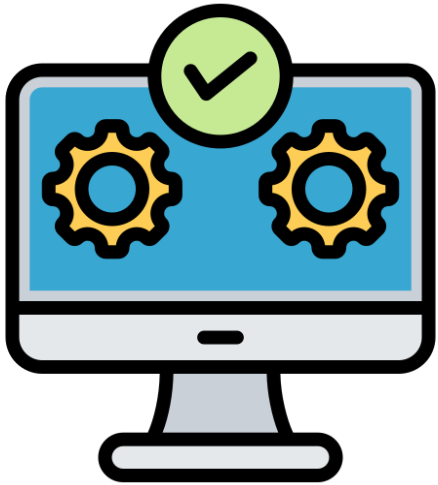
- **Performance objectives**
 - The quality or usefulness of the output
 - Accuracy of the output
 - The speed at which output is generated
 - The scalability of the resulting system
 - The risk of the system
- **Cost Objectives**
 - Development cost
 - Cost related to the uniqueness of the system application
 - Fixed investments in hardware and related equipment
 - Ongoing operating costs of the system



- **Common systems development life cycles**
 - Traditional
 - Prototyping
 - Rapid application development (RAD)
 - End-user development



- **Systems investigation**
 - Identifies problems and opportunities and considers them in light of business goals
- **Systems analysis**
 - Studies existing systems and work processes to identify strengths, weaknesses, and opportunities for improvement
- **Systems design**
 - Defines how the information system will do what it must do to obtain the problem's solution

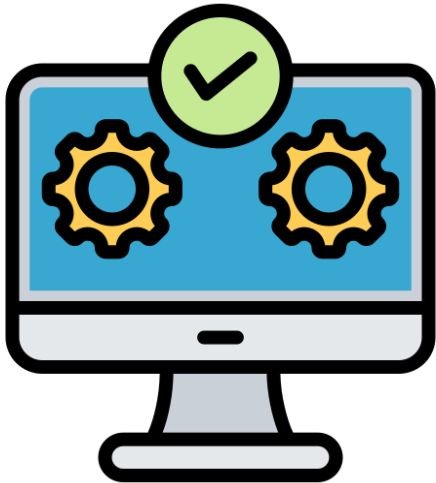


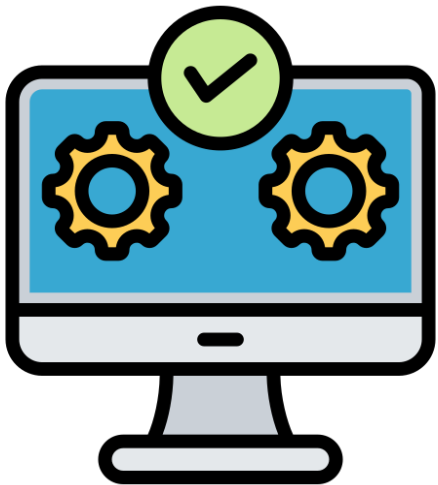
- **Systems implementation**

- Creates or acquires various system components detailed in systems design, assembles them, and places new or modified system into operation

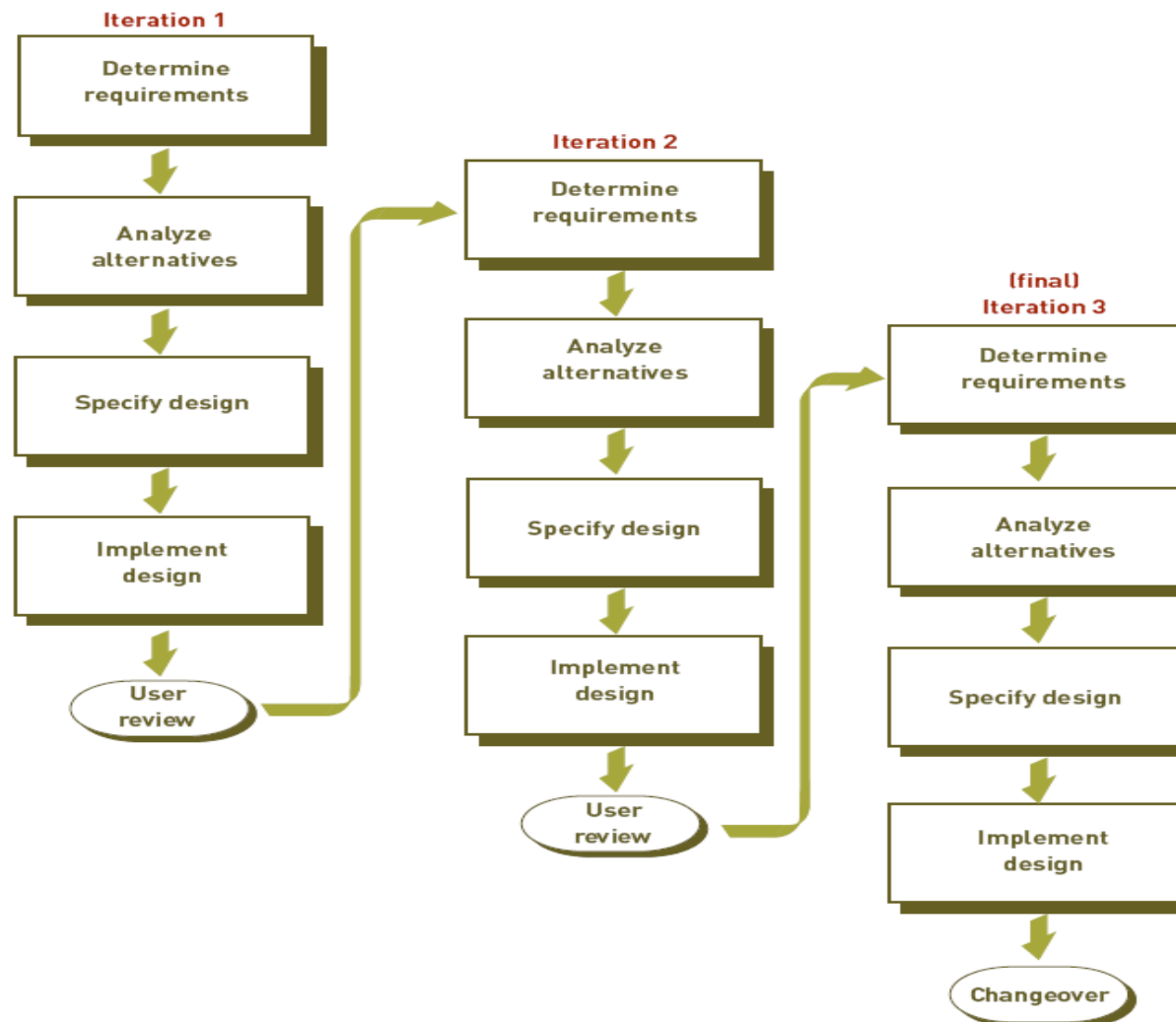
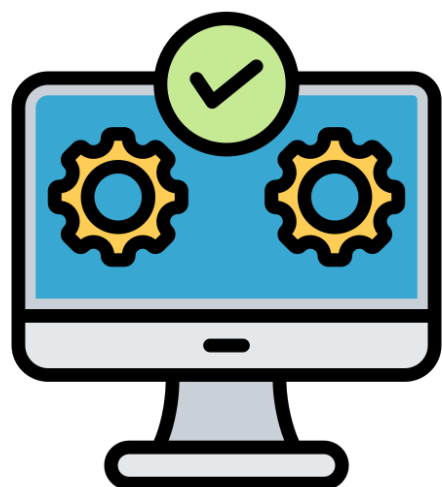
- **Systems maintenance and review**

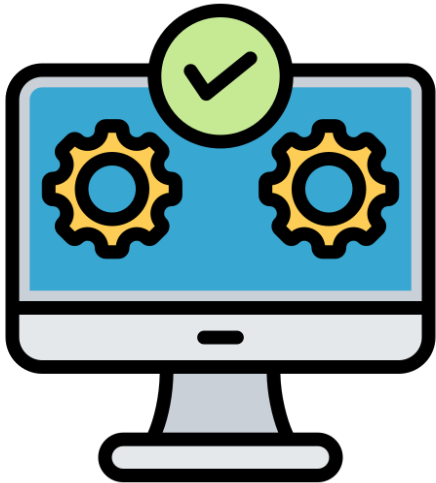
- Ensures the system operates as intended
- Modifies the system so that it continues to meet changing business needs



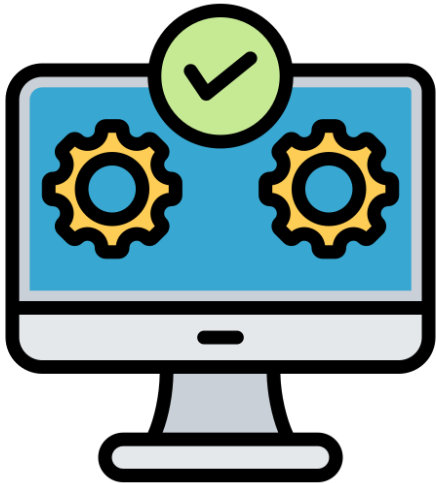


- **An iterative approach**
- **Operational prototype**
 - **Prototype that works**
 - Accesses real data files, edits input data, makes necessary computations and comparisons, and produces real output
- **Nonoperational prototype**
 - A mock-up, or model
 - Includes output and input specifications and formats





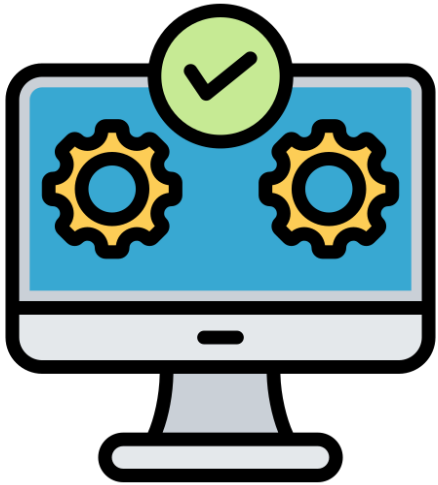
- **Rapid application development (RAD)**
 - Employs tools, techniques, and methodologies designed to speed application development
 - Makes extensive use of the joint application development (JAD)
- **Other approaches to rapid development**
 - Agile development
 - Extreme programming (XP)

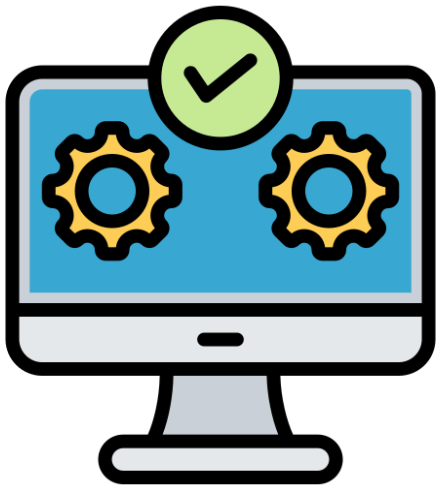


- **End-user systems development**
 - Systems development project in which business managers and users assume the primary effort
- **Disadvantages**
 - Some end users do not have the training to effectively develop and test a system



- **Reasons Companies use them:**
 - Reduces costs
 - Obtains state-of-the-art technology
 - Eliminates staffing and personnel problems
 - Increases technological flexibility

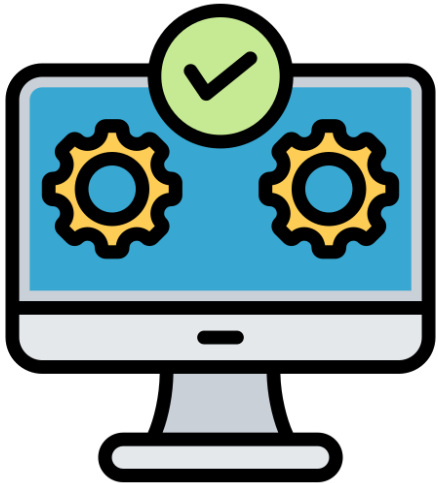




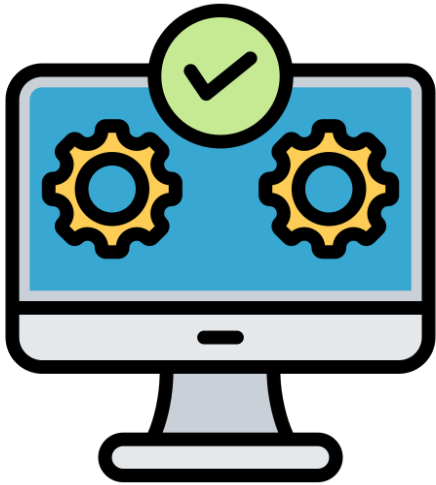
Reason	Example
When a company believes it can cut costs	PacifiCare outsourced its IS operations to IBM and Keane, Inc. PacifiCare hopes the outsourcing will save it about \$400 million over ten years.
When a firm has limited opportunity to distinguish itself competitively through a particular IS operation or application	Kodak outsourced its IS operations, including mainframe processing, telecommunications, and personal computer support, because it had limited opportunity to distinguish itself through these IS operations. Kodak kept application development and support in-house because it thought that these activities had competitive value.
When outsourcing does not strip the company of technical know-how required for future IS innovation	Firms must ensure that their IS staffs remain technically up-to-date and have the expertise to develop future applications.
When the firm's existing IS capabilities are limited, ineffective, or technically inferior	A company might use outsourcing to help it make the transition from a centralized mainframe environment to a distributed client/server environment.
When a firm is downsizing	First Fidelity, a major bank, used outsourcing as part of a program to reduce the number of employees by 1,600 and slash expenses by \$85 million.



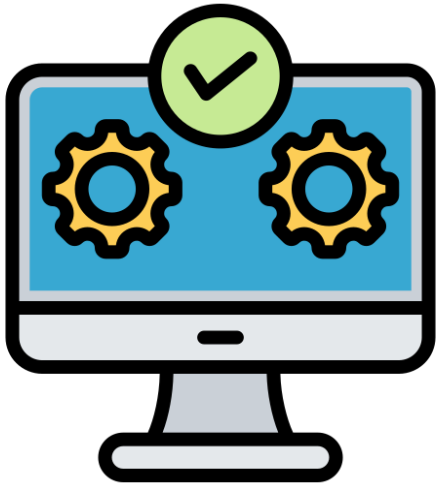
Factors Affecting Systems Development Success



- Degree of Change
- Continuous Improvement versus Reengineering
- Managing Change
- Quality and Standards
- Use of Project Management Tools
- Use of CASE tools
- Object Oriented Systems Development



- **Purpose: identify potential problems and opportunities**
- **Uncovers following questions:**
 - What primary problems might a new or enhanced system solve?
 - What opportunities might a new or enhanced system provide?
 - What new hardware, software, databases, telecommunications, personnel, or procedures will improve an existing system or are required in a new system?
 - What are the potential costs (variable and fixed)?
 - What are the associated risks?



- **Initiating Systems Investigation**

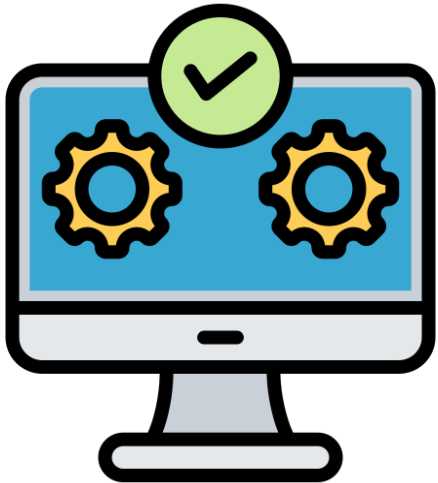
- ***Systems Request Form*** submitted by someone who wants IS department to initiate systems investigation
- Information included
 - Problems in or opportunities for system
 - Objectives of systems investigation
 - Overview of proposed system
 - Expected costs and benefits of proposed system

- **Participants in Investigation**

- Upper and middle level managers
- Project manager
- IS personnel
- Users, stakeholders



- **Feasibility Analysis**

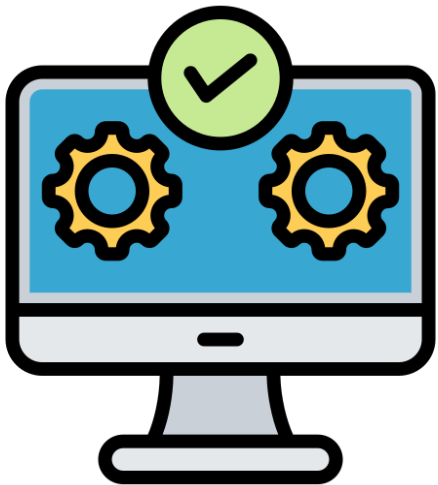


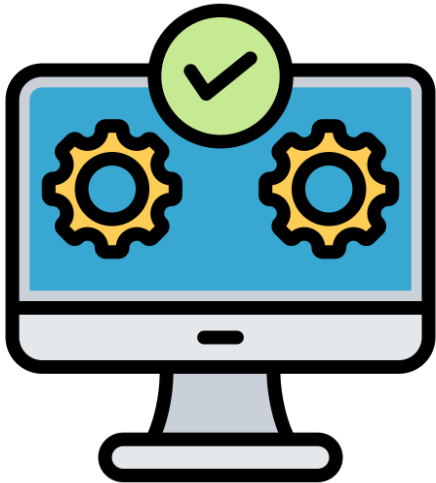
- Technical feasibility
- Economic feasibility
- Net present value
- Legal feasibility
- Operational feasibility
- Schedule feasibility



- **The Systems Investigation Report**

- Outcome of systems investigation
- Summarizes results of systems investigation
- Recommends course of action: continue, modify or drop
- Report reviewed by steering committee



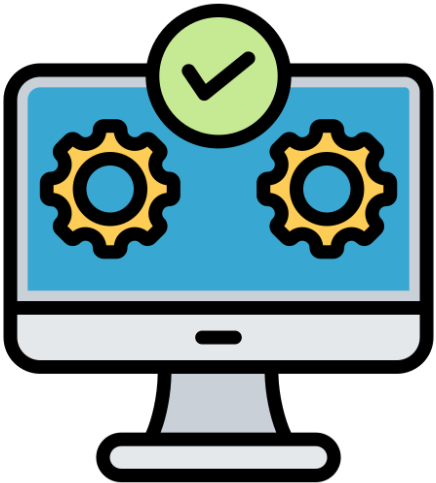


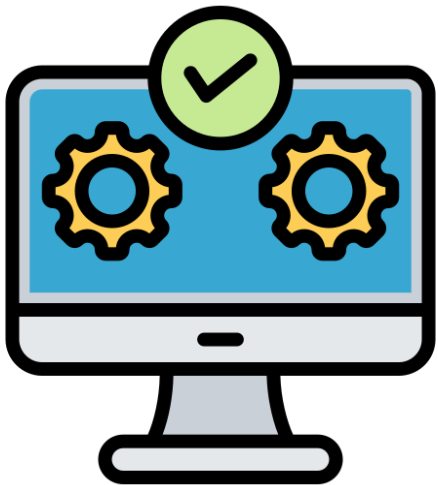
- **Question: What must the IS do to solve the problem?**
- **General Considerations:**
 - Clarify goals of the organization
 - Assembling the participants of systems analysis
 - Collecting appropriate data and requirements
 - Analyzing the data and requirements
 - Preparing report on existing system, new system requirements, project priorities
- **Participants**
 - Original development team
 - Team Develops:
 - List of objectives and activities
 - Deadlines
 - Statement of resources required
 - Major milestones



- **Data Collection**

- Identify sources of data
- **Data Collection**
- Structured interview
- Unstructured interview
- Direct Observation
- Questionnaires
- Statistical sampling





- **Data Analysis**

- Manipulating the collected data so that it can be used
- Tools and techniques for data analysis are as follows:

- **Data Modeling**

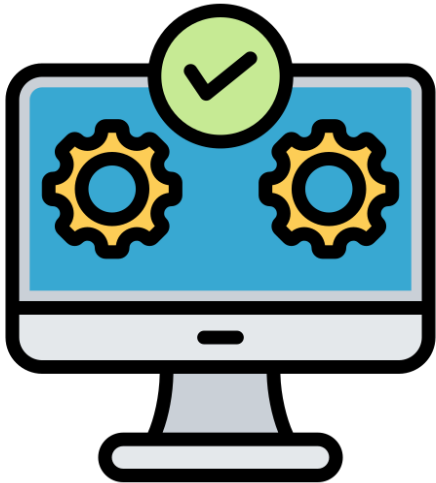
- Approach to modeling organizational objects and associations
- ER diagram – objects and relationships, where entities have attributes

- **Application Flowcharts**

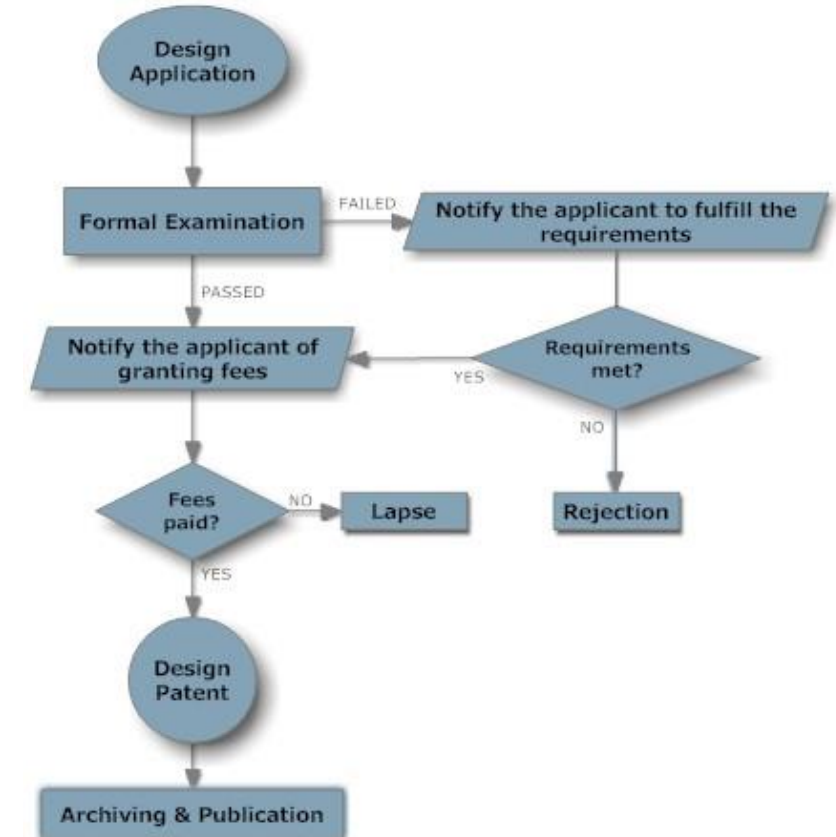
- Show relationships among applications or systems
- E.g. clear relationships among order processing functions

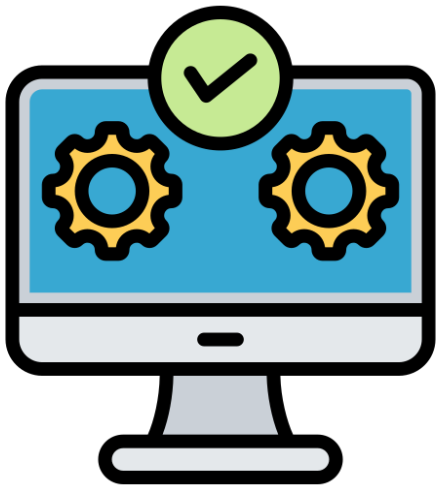
- **Grid Charts**

- A table that shows relationships among various aspects of system development
- E.g. a chart between showing various applications using different databases



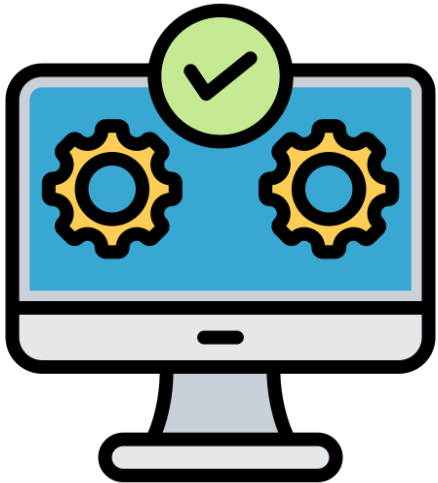
Databases Applications	Customer database	Inventory database	Supplier database	Accounts receivable database
Order processing application	X	X		
Inventory control application		X	X	
Marketing analysis application	X	X		
Invoicing application	X			X





- **Activity Modeling**

- Done through the use of Data-flow diagrams (DFD)
- Models objects, associations and activities by describing how data can flow between and around objects
- DFD describes activities that accomplish a business task
- Consists of four primary symbols
 - Data flow
 - Process symbol
 - Entity symbol
 - Data store



- **Requirements Analysis**

- Purpose: determine user, stakeholder, and organizational needs
- capture requests of various people in detail

- **Asking directly**

- Works best for stable systems in which users understand system functions

- **Using CSF**

- Managers make list of factors that are critical to success of their field

- **The IS Plan**

- Translates strategic and organizational goals into systems development initiatives

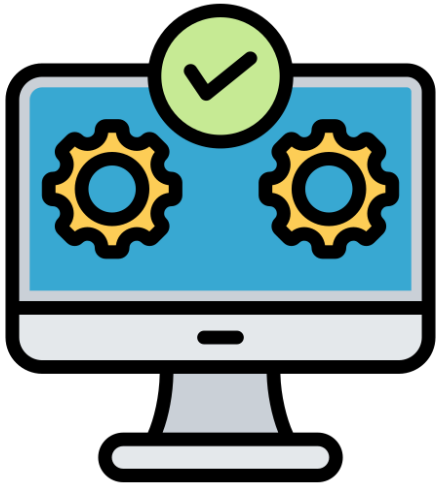
- **OO systems Analysis**

- Object oriented approach is used to identify problems and show relationships by showing objects as classes



- **Systems Analysis Report**

- Strengths and weaknesses of existing system from a stakeholder's perspective
- User/stakeholder requirements for new system
- Organizational requirements for new system
- Description of what new information system should do to solve the problem





Thank You