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COLLEGE OF ENGINEERING AND TECHNOLOGY

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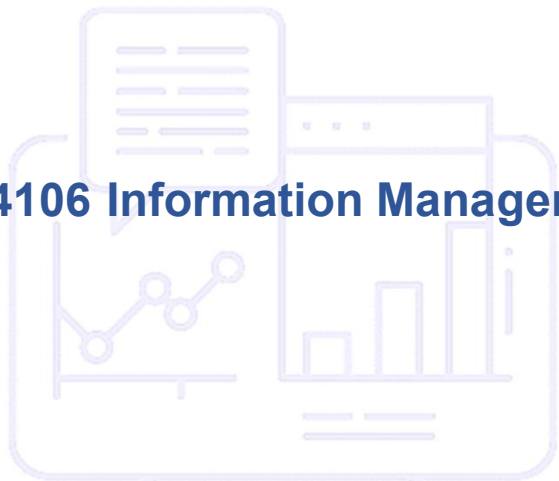


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Department of Management Studies

MBA – I Semester

BA4106 Information Management



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UNIT –II

2.2 System Analysis and Design

2. System Analysis and Design

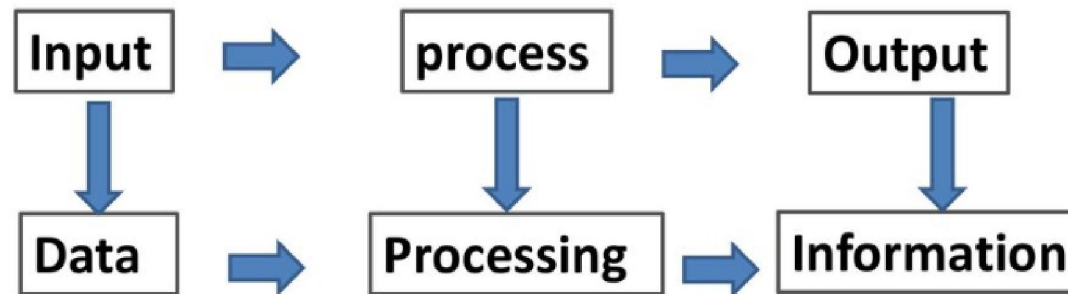


2. System Analysis and Design - Overview

- System Analysis and Design (SA&D) is a systematic approach to improve the design and organization of a system or process.

Basic Elements of a system

System: Collection of Interrelated components that work together to perform a specific task



Example: Physical systems of sun and its planets
Biological system of the human body
Technological System of Oil refinery

System Development can generally have two major components:

1. System Analysis
2. System Design

What is System Analysis ?

- ❑ Concentrates on “ **What**” the system should do to meet the requirement of user.
- ❑ Process of
 - ❑ Gathering and interpreting facts
 - ❑ Diagnosing Problems
 - ❑ Recommend improvement to system
- ❑ Process of breaking the system down into its individual components
- ❑ Analyst collects the requirements of the system and documents them.

What is System Design ?

- ❑ Identifies “ **How** the system will accomplish this change”
- ❑ Process of
 - ❑ Planning a new system
 - ❑ Replace or complement existing system
- ❑ Designing the architecture, components, modules, interfaces, and data
- ❑ System Design is a bottom-up approach



System Analysis

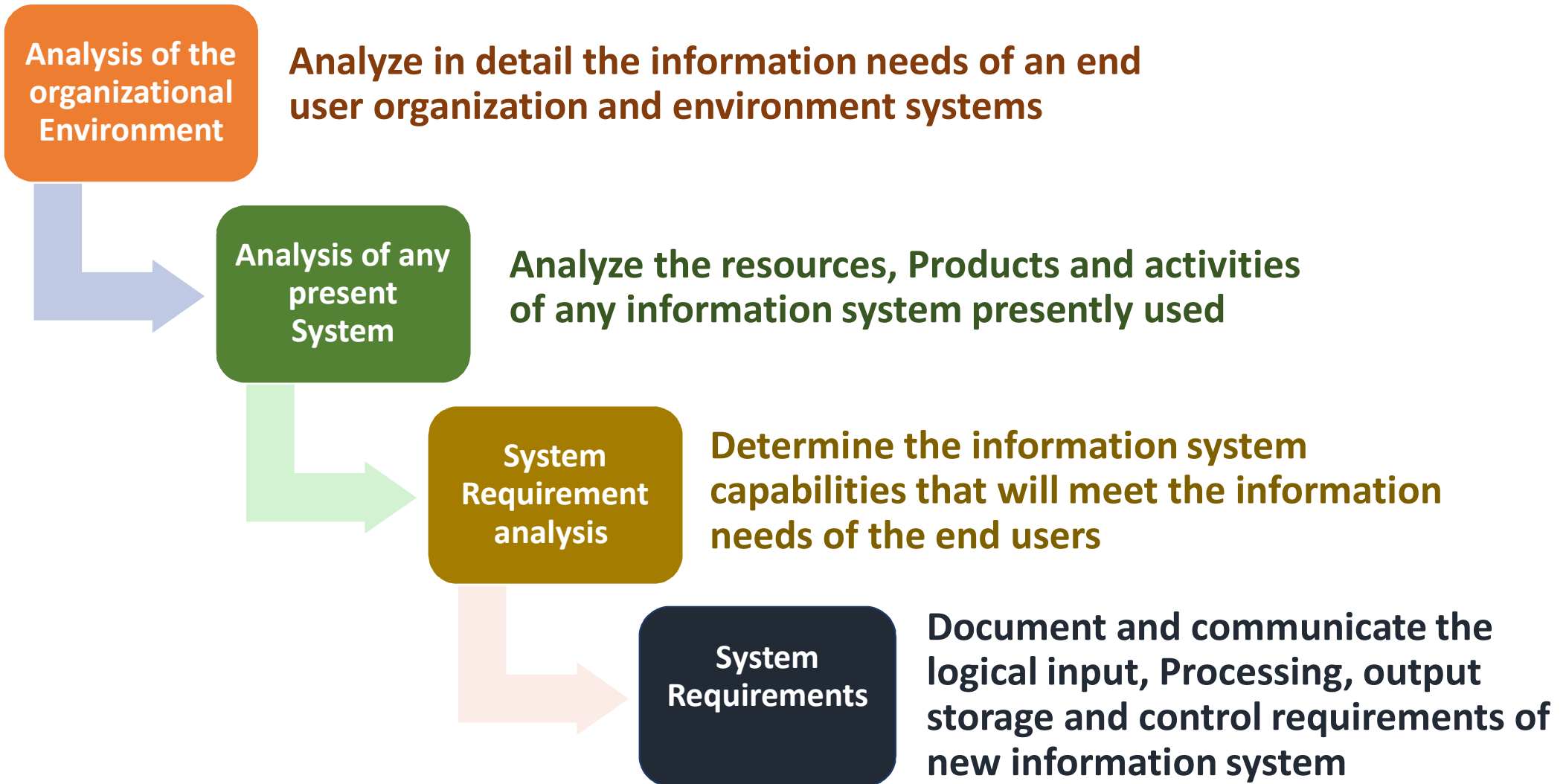
- ❑ Systems analysis is a process of
- ❑ collecting factual data,
- ❑ understand the processes involved,
- ❑ identifying problems and
- ❑ recommending feasible suggestions.
- ❑ Studying the business processes,
- ❑ gathering operational data,
- ❑ understand the information flow,
- ❑ Finding out bottlenecks and
- ❑ Evolving solutions for overcoming the weaknesses of the system

System analysis is the process of breaking the system down into its individual components and understanding how each component interacts with the other components

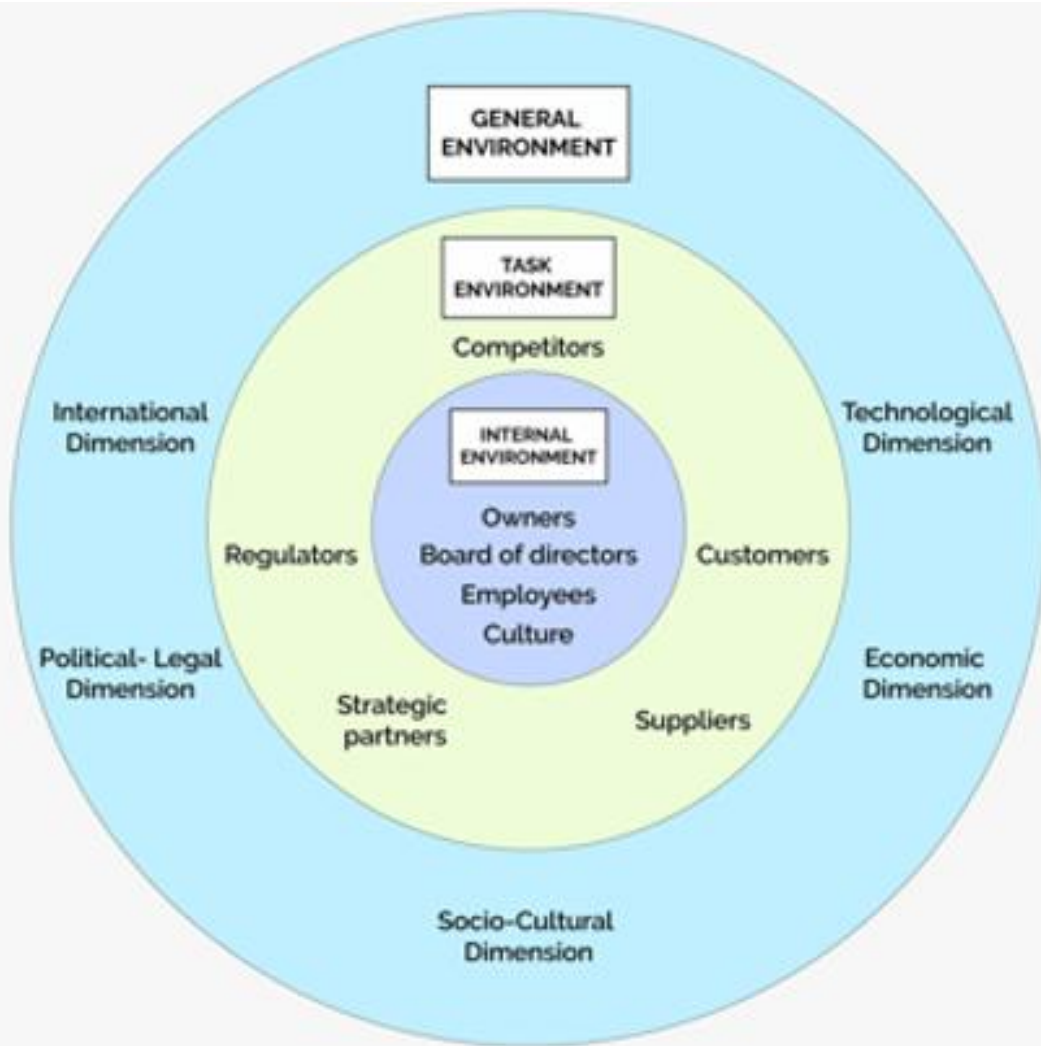
Need for System Analysis

- System Objective
- System Boundaries
- System Importance
- Nature of The System
- Role of the System as an Interface
- Participation of Users
- Understanding of Resource Needs
- Assessment of Feasibility

System Analysis Activities



Analysis of the organizational Environment



Analysis of any present System

- ❑ Before designing a new system, Understand present system
- ❑ Check- improvement or replacement needs
- ❑ How system utilizes H/W, S/W, HR ?
- ❑ Analyze input, output, storage and control

System Requirement Analysis

- ❑ Need Analysis or **user-requirement analysis** of end user are determined
- ❑ Determine **information processing ability** (Input, processing, output and control)
- ❑ **Logical system requirements** are developed. i.e., Information requirements of end user

System Requirements

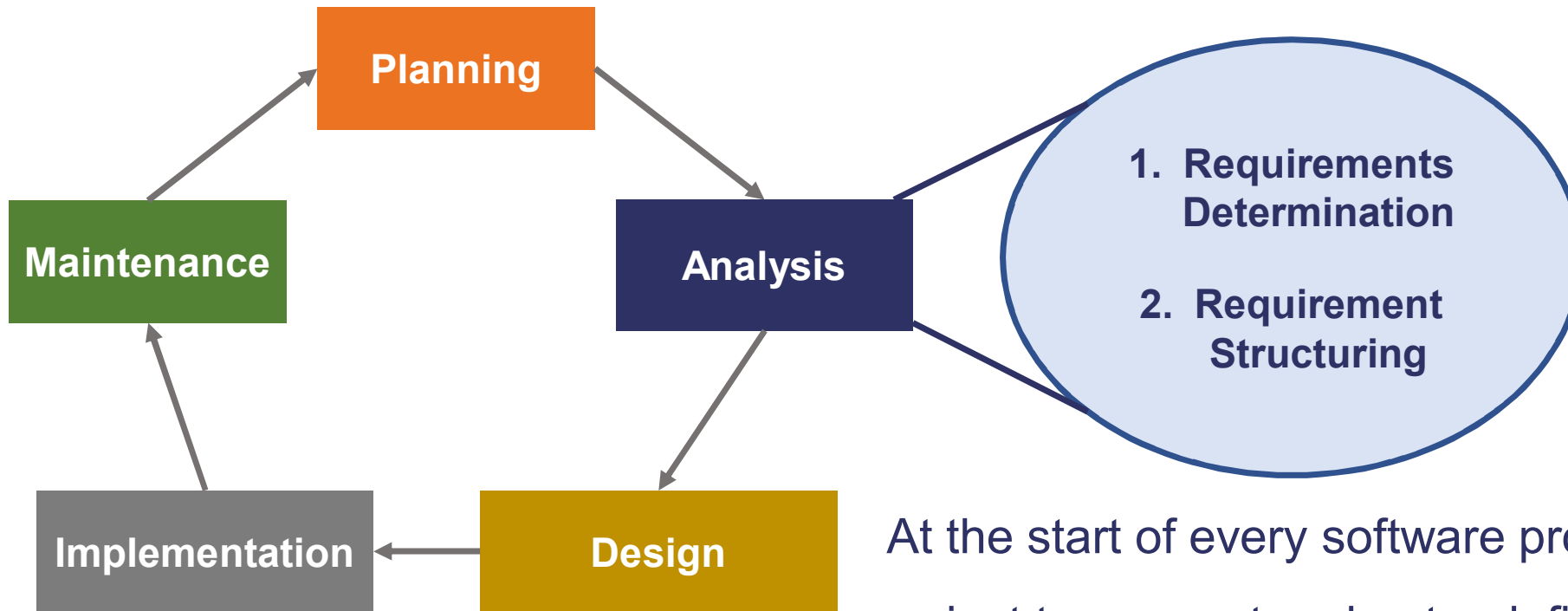
Input Requirements: Sources, contents, formats, organization, volume, frequency, codes, capture and conventional requirements

Output Requirements: formats, organization, volume, frequency, end user destinations and timing

Processing Requirements: calculations, decision rules, converting input to output, response time, turnaround time

Storage requirements: Organization, Content, database size, types and frequency of updating, record retention and deletion

Phases of System Analysis



At the start of every software project, the project team must understand, finalize and document the features and functionalities required of the end product.

Requirements Determination:

Requirements Anticipation: System Analysts assumes requirements based on his previous experience.

Requirements Elicitation: System Analysts uses Interviews, questionnaires, group brainstorming meetings, voice and e-mail to collect user requirements

Requirements Assurance: System Analysts uses various assurance techniques to validate and verify the requirements with user . Ex: user walk-through – analysts and user together review the documented requirements.

Requirements Determination:

Requirements Specification: System Analysts use this to understand customer's requirements and organize them into a document. This is connected with "Computer Aided Software Engineering" (CASE) technology.

Tools for requirement determination:

Different tools for fact finding are;

1. Document Analysis
2. Onsite observation
3. Interviews
4. Questionnaires

Requirements Structuring

Information /understanding bout requirement of software product

Converted into

Logica model

Structured documentation tools are used by technical/non-technical users

Some requirement structuring tools are;

- 1.Data Flow Diagram (DFD)
2. Decision Table
3. Decision Tree
4. Structured English
5. Entity Relationship (ER) Diagrams

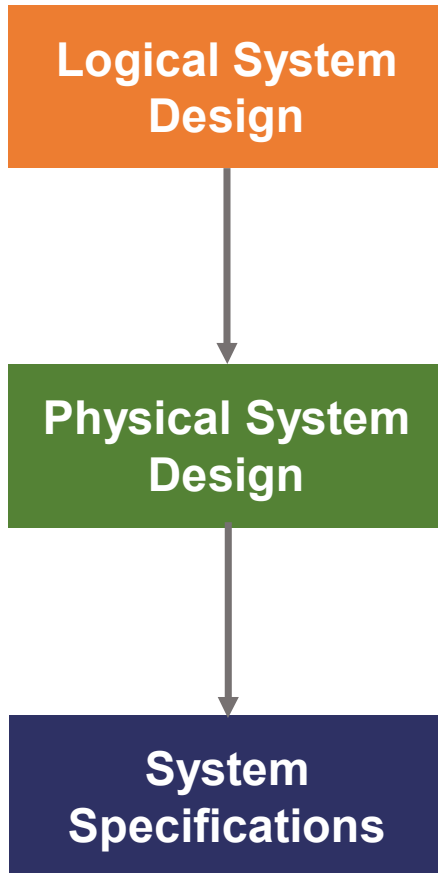


System Design

The analyst engages in the following actions during the system design phase,

1. Plans design activities
2. Works with user to decide different data input to system
3. Draw models of the new system by using Data Flow Diagram (DFD)
4. Clearly describes the data requirements
5. Write down program specifications
6. Recognizes and orders hardware and software whenever required.

System Design



Develop general specifications: how input, processing, output and control activities meet system requirements

Develop detailed specifications for user interface products and methods, database structures and processing procedures, H/w, S/w personnel specifications developed

Document and communicate the detailed specifications of the proposed system to end-users

Logical System Design

- ❑ Outcome of this design can be referred to as the “ **blueprint of the proposed system**”
- ❑ Design phase starts **after Analysis stage** is finished.
- ❑ Logical system design refers to a **broad design** which converts the total organizational system.
- ❑ This is also called “ **feasibility design**” or “ **High level design**”.
- ❑ **Conceptual system design** is prepared before deciding on various designs.

Steps of Logical System Design

1. Current physical system and their data flows, volumes, file content frequencies, are Reviewed
2. Output specifications are prepared
3. Input details are prepared. Flow of document from input data source to the actual input location also determined
4. Edit, security and control specifications are prepared. Rules for edit correction,
5. Implementation plan is recognized
6. Benefits and system constraints, target dates, costs are reviewed.

Physical System Design

- ❑ Physical design is the stage where the logical design is transformed into a concrete, physical system.
- ❑ It is a **blue print of logical system design**
- ❑ It produces **Program specification, physical file, database definition**
- ❑ It includes user-interface design

Steps of Physical System Design

1. Physical system should be designed

1. Specify input/output
2. Design database - specify backup procedure
3. Design physical information flow

2. System Implementation should be planned

1. Prepare a **conversion schedule** with target date
2. **Establish Training procedure**, Course and Time-table should be established

3. Develop **Test and Implementation Plan** add specify any new H/W and S/W.

4. **Update Cost, Conversion date**, benefits and system constraints

System Design

User Interface, Data and Process Design

User Interface Design

Screen, Form, Report and Dialog Design

Data Design

Data Element Structure Design

Process Design

Program and Procedure Design

User Interface Design :

- ❑ Designing **interactions** between end users and Computer system
- ❑ It concentrates on **input/output methods**, Conversion of data and information – **human readable** and **machine readable** form
- ❑ It produces detailed **specifications** for information products such as display screens, interactive user/ computer dialogues, audio responses, forms, documents and reports

Data Design

- ❑ Design of logical structure of data bases and files to be used.
- ❑ Data design produces detailed description of:
 - ❑ The entities (people, places, things, events)
 - ❑ The relationship of these entities
 - ❑ The specific data elements (databases, files, records, etc ...)
 - ❑ The integrity rules that govern how each data element is specified.

Process Design

- ❑ Design of software resources
- ❑ Developing detailed specifications for program modules.
- ❑ Software packages have to be purchased or custom programming is developed

3. System Specifications

1. **User Interface specifications:** *Personalized screens*
2. **Database specifications:** for accessing customer and inventory data
3. **Software specification:** retrieving product data and computing all sales amount within a second
4. **Hardware and Network Specifications:** Install network servers and high bandwidth telecommunication lines
 - provide communication between company
5. **Personnel Specifications :** *Hire a manager, specialist, designer* for planning, developing and managing strategies

Role of System Analysts

