



Department of ICT

System Analysis and Design (SYAD-2432)

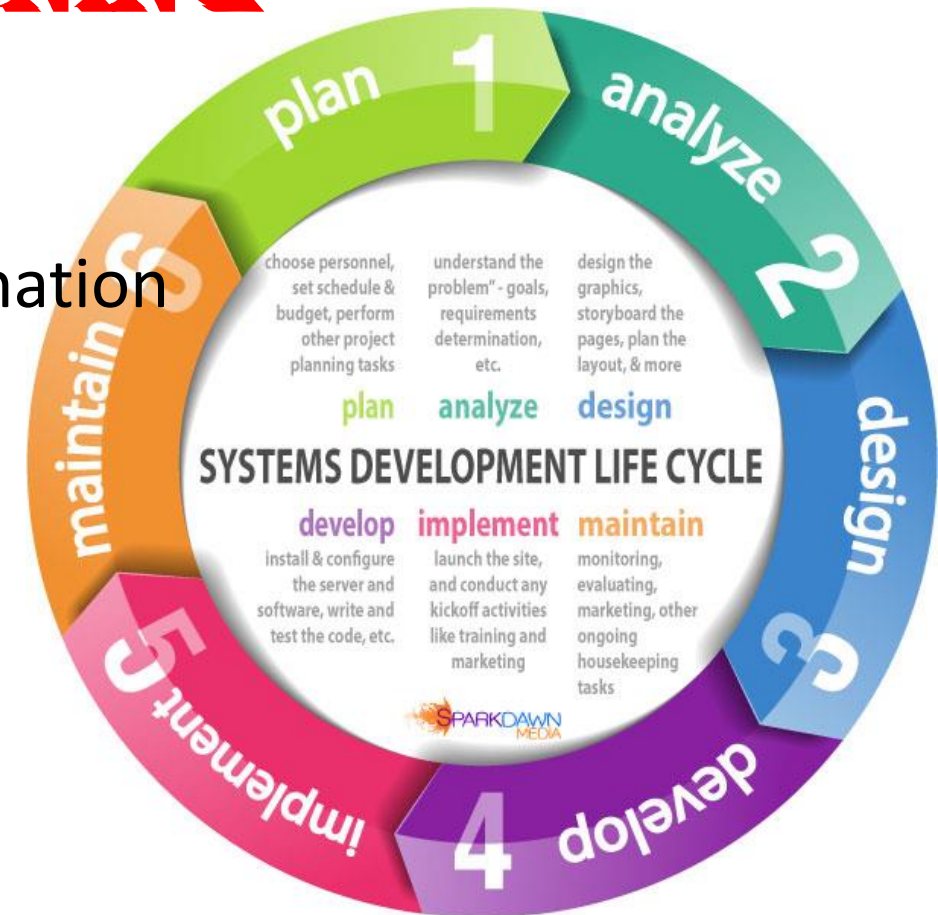
CHAPTER 3: SYSTEM PLANNING

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1. What is Requirements Determination?
2. Major Activities in requirement Determination
3. Information Gathering Techniques
4. Feasibility Study
5. Steps Involved in Feasibility Analysis
6. Types of Feasibilities



SYSTEM PLANNING



"Laying the foundation for successful system development."

❖ What is System Planning?

- The first step in SDLC to define direction, scope, and feasibility.

❖ Why It Matters:

- Avoids costly errors (e.g., system failure, budget overruns).
- Ensures alignment with stakeholder needs.

❖ Two Core Activities:

1. Requirements Determination
2. Feasibility Study



SYSTEM PLANNING

- **Planning** is deciding in advance
 - What is to be done
 - When where
 - How and by whom it is to be done.
- Planning bridges the gap from **where we are** to **where we want to go**.
- System planning is the first phase in the system development life cycle
- System planning is where an organization's total information needs are identified, analyzed, prioritized and arranged.



1. Requirements Determination



- Requirements Determination is the process of defining, documenting, and analyzing the needs and constraints of stakeholders for a proposed system or project.
- Importance: Requirement determination helps ensure that the proposed system meets the needs of stakeholders, which ultimately increases the chances of success for the system.

Requirements



[illegible]

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- A graphic of a white puzzle piece with the word "REQUIREMENTS" in orange and red text. The puzzle piece is set against a dark gray background. The word "REQUIREMENTS" is written in a bold, sans-serif font, with "REQUIRE" in orange and "MENTS" in red. The puzzle piece has a 3D effect with a shadow.



1. Requirements Determination

❖ Needs vs. Requirements:

- *Need*: "Improve customer service."
- *Requirement*: "System shall resolve customer queries in <2 mins."



❖ Types of Requirements:

- **Functional**: *What* the system does (e.g., "Generate sales reports").
- **Non-Functional**: *How well* it does it (e.g., "Process 1k transactions/sec").



❖ Example:

- Library system requirement: "Allow members to borrow 5 books via RFID scan."

2. Major Activities in Requirement Determination.

- Understanding business needs and objectives,
- Identifying stakeholders and their needs,
- Defining functional and non-functional requirements,
- Analyzing the requirements,
- Documenting the requirements.

2. Major Activities in Requirement Determination

- **Understanding business needs and objectives:**
 - This includes identifying the goals, objectives, and vision of the organization.
- **Identifying stakeholders and their needs:**
 - This involves identifying all stakeholders and their requirements for the proposed system.
- **Defining functional and non-functional requirements:**
 - This contains defining the functional requirements that the proposed system must meet and the non-functional requirements such as performance, reliability, and security.
- **Analyzing the requirements:**
 - This involves reviewing, prioritizing, and validating the requirements.
- **Documenting the requirements:**
 - This implicates capturing the requirements in a formal document that can be used as a reference throughout the project.



3. Information Gathering Techniques.

- These techniques include
 1. Interviews
 2. Surveys
 3. Observation
 4. Document analysis.



3. Information Gathering Techniques.

- **Interviews**: A face-to-face or virtual conversation with stakeholders to gather their requirements and opinions.
- **Surveys**: A questionnaire sent to stakeholders to gather their feedback and opinions.
- **Observation**: The process of observing stakeholders in their natural work environment to understand their needs and behaviors.
- **Document analysis**: Reviewing existing documents such as reports, contracts, and user manuals to understand the current system and its requirements.

Information Gathering Techniques

Comparison Table:

Technique	Best For	Pros	Cons
Interviews	Deep insights	Rich, detailed data	Time-consuming
Questionnaires	Large audiences	Cost-effective, scalable	Low response rates
Observation	Real-world workflows	Uncovers hidden issues	Hawthorne Effect
JAD Sessions	Collaborative design	Fast consensus-building	Requires skilled facilitator

4. Feasibility Study

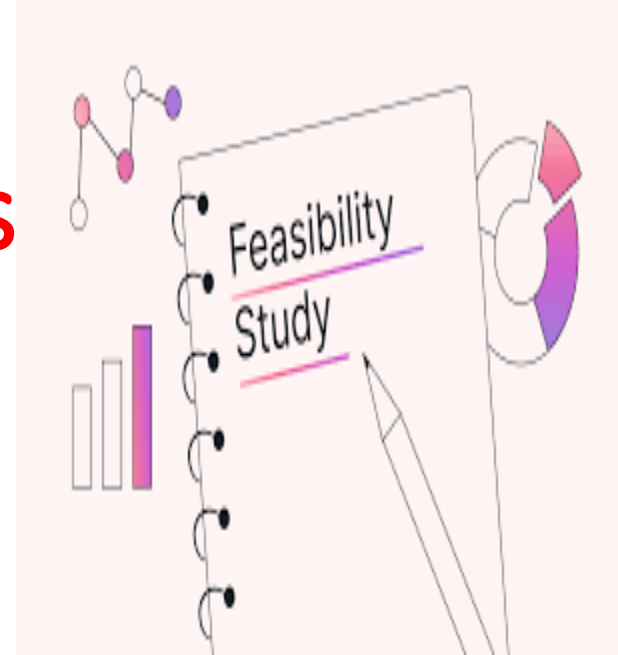


- A feasibility study is an assessment of the practicality of a proposed project or system.
- A feasibility study helps determine whether a proposed project or system is worth pursuing and can identify potential risks and challenges.



5. Steps Involved in Feasibility Analysis

- Five steps involved in feasibility analysis, which are
 1. Defining the problem and scope
 2. Identifying alternative solutions
 3. Evaluating the alternatives based on technical, financial, and operational feasibility
 4. Choosing the best solution
 5. Preparing a feasibility report



5. Steps Involved in Feasibility Analysis



- **Define the problem and scope:** This contains identifying the problem that the proposed system will solve and its scope.
- **Identify alternative solutions:** This involves researching and brainstorming possible solutions to the problem.
- **Evaluate the alternatives:** This implicates assessing the technical, financial, and operational feasibility of each alternative solution.
- **Choose the best solution:** This includes selecting the solution that best meets the needs of stakeholders and is feasible.
- **Prepare a feasibility report:** This comprises documenting the findings and recommendations of the feasibility analysis in a formal report.

6. Types of Feasibilities



- There are three types of feasibilities: **technical, financial, and operational feasibility.**
 - **Technical feasibility:** Whether the proposed system can be developed using available technology and resources.
 - **Financial feasibility:** Whether the proposed system is financially viable and can be developed within budget.
 - **Operational feasibility:** Whether the proposed system is operationally viable and can be integrated into existing business processes.



Technical feasibility

- Technical feasibility is an important aspect of system planning as it assesses whether the proposed system can be developed and implemented with the available technology and resources.
- It helps to identify potential technical challenges and limitations that may impact the success of the project.
- By conducting a technical feasibility study, organizations can ensure that the proposed system is technically viable, feasible, and sustainable.
- This can help to reduce **risks**, **minimize costs**, and **improve** the likelihood of project success.
- Ultimately, technical feasibility is crucial to the success of any project, as it ensures that the proposed system can be effectively implemented to achieve organizational goals and objectives

TECHNICAL FEASIBILITY



TECHNICAL FEASIBILITY



TECHNICAL FEASIBILITY



TECHNICAL FEASIBILITY





Technical feasibility

- To achieve organizational goals and objectives.
- The following are steps that can be taken to assess technical feasibility:
 1. **Analyze existing technology and infrastructure:**
 - ✓ Assess the current technology and infrastructure to identify any potential limitations and gaps that may affect the proposed system's implementation.
 2. **Identify technical requirements:**
 - ✓ Identify the technical requirements for the proposed system, including hardware, software, and network requirements, and assess the availability and compatibility of these requirements.
 3. **Evaluate technical risks:** Identify and evaluate technical risks that may arise during the development and implementation of the proposed system, such as system crashes, data loss, and security breaches.
 4. **Consider scalability:** Assess the system's scalability, including its ability to handle future growth and changes in the organization's needs.

Examples of technical feasibility

- Examples of technical feasibility assessments may include analyzing the compatibility of a new software system with existing hardware and network infrastructure, assessing the security risks associated with implementing a new system, or evaluating the scalability of a proposed system to accommodate future growth.
- By assessing technical feasibility, organizations can identify potential technical challenges and limitations and develop strategies to address these issues.
- This can help to minimize risks, reduce costs, and improve the likelihood of project success.

Financial feasibility

- ❑ Assessing the financial feasibility of a project involves estimating the costs and benefits associated with it, and then determining whether the return on investment (ROI) is sufficient to justify the investment.
- ❑ Here are the steps to assess financial feasibility:
 1. Identify the costs
 2. Estimate the benefits
 3. Calculate the ROI
 4. Analyze the results
- It is important to note that ROI should not be the only factor considered when assessing the financial feasibility of a project.



Example

❖ Let's say that a company is considering investing \$100,000 in a new software system that is expected to improve efficiency and reduce labor costs. The company estimates that the new software will result in labor cost savings of \$50,000 per year for the next five years. They also estimate that the software will require \$10,000 per year in maintenance costs.

1. To calculate the ROI, we can use the following formula:

$$\text{ROI} = (\text{Net Profit} / \text{Investment}) \times 100\%$$

$$\begin{aligned}\text{Net Profit} &= \text{Benefits} - \text{Costs} \\ \text{Net Profit} &= (\$50,000 \times 5) - (\$10,000 \times 5)\end{aligned}$$

$$\text{Net Profit} = \$200,000$$

$$\text{ROI} = (\$200,000 / \$100,000) \times 100\%$$

$$\text{ROI} = 200\%$$

In this case, the ROI is 200%, which is a very **positive result**.

- ❖ This indicates that the benefits of the new software system greatly outweigh the costs, and the investment is financially feasible.
- However, it's important to note that ROI is just one factor to consider when assessing financial feasibility.
- Other factors, such as the risks associated with the project, the company's strategic goals, and the potential for unforeseen expenses, should also be taken into account.

Operational feasibility



- Assessing operational feasibility involves evaluating whether a proposed system or project is **acceptable** and **practical** for stakeholders.
- The steps to assess operational feasibility:
 1. Identify stakeholders
 2. Define requirements
 3. Evaluate current processes
 4. Conduct stakeholder analysis
 5. Evaluate acceptability
 6. Assess practicality



STEPS TO ASSESS OPERATIONAL FEASIBILITY

1. Identify stakeholders:

- The first step is to identify all stakeholders who will be affected by the proposed system. This may include employees, customers, suppliers, and management.

2. Define requirements:

- The next step is to define the requirements for the proposed system. This involves identifying the functions and features that are necessary to meet stakeholder needs.

3. Evaluate current processes:

- The next step is to evaluate the current processes and systems in place. This involves understanding how things currently work, identifying any problems or inefficiencies, and determining whether the proposed system can address those issues.

STEPS TO ASSESS OPERATIONAL FEASIBILITY

4. Conduct stakeholder analysis:

- Once you have identified the stakeholders, it's important to conduct a stakeholder analysis to understand their needs and preferences. This can be done through surveys, interviews, focus groups, or other methods.

5. Evaluate acceptability:

- Based on the stakeholder analysis, evaluate whether the proposed system is acceptable to stakeholders. This involves assessing whether the system meets their needs, whether it's user-friendly, and whether it will be adopted by stakeholders.

6. Assess practicality:

- Finally, assess the practicality of the proposed system. This involves evaluating whether the system can be implemented within the constraints of the organization, such as budget, time, and resource limitations.

Benefits of Feasibility Study



- Helps identify potential risks and challenges before investing significant time and resources in a proposed system or project.
- Helps ensure that the proposed system is feasible and aligns with the goals and objectives of the organization.
- Helps provide a roadmap for the development and implementation of the proposed system.



Challenges of Feasibility Study



- Lack of accurate and reliable data.
- Uncertainty and unpredictability of the future.
- Incomplete and inaccurate analysis.

Mitigating Challenges in Feasibility Study.

- Conduct thorough research and analysis.
- Involve stakeholders in the feasibility study process.
- Use multiple information gathering techniques.



Importance of Effective System Planning.

- Helps ensure the success of a proposed system or project.
- Helps identify potential risks and challenges before investing significant time and resources.
- Helps ensure that the proposed system meets the needs of stakeholders and aligns with the goals and objectives of the organization.

System Planning Best Practices

- Best Practices in System Planning.
 - Involve stakeholders in the planning process.
 - Conduct thorough research and analysis.
 - Use multiple information gathering techniques.
 - Consider the technical, financial, and operational feasibility of the proposed system.

Common Challenges in System Planning

- Some of the most common challenges include
 - Budget constraints
 - Time constraints
 - Stakeholder conflicts.
- **Budget constraints** may limit the resources available for the project, affecting the scope of the system
- **Time constraints** can lead to rushed decisions or implementation, which can affect the quality of the system.
- **Stakeholder conflicts** can arise due to differing opinions or expectations about the system, which can delay or derail the project.
- Proper planning and communication can help mitigate these challenges and lead to a successful system implementation.

Mitigating challenges in system planning

- Mitigating challenges in system planning involves **identifying** and **addressing** potential issues early in the planning process
- Strategies for mitigating common challenges include **prioritizing requirements** to ensure that the most critical needs are addressed within budget and time constraints.
- Involving stakeholders in decision-making can help to address conflicts and ensure that the system meets their needs and expectations.
- Effective communication and collaboration between stakeholders, project managers, and developers can also help to minimize misunderstandings and delays.
- Additionally, regularly reviewing and adjusting the project plan can help to ensure that the system is delivered on time, within budget, and to the satisfaction of all stakeholders.

Conclusion

❑3.1 Requirements Determination:

- Requirements determination is the process of identifying and defining the needs and objectives of the project.
- It involves understanding the current system and its limitations, as well as identifying new requirements that need to be fulfilled.

❑3.2 Major Activities in Requirement Determination:

- There are several major activities involved in requirement determination, including identifying stakeholders, defining objectives, analyzing existing systems, and prioritizing requirements.

❑3.3 Information Gathering Techniques:

- There are various techniques that can be used to gather information during the requirements determination phase, such as interviews, surveys, observations, and document analysis.
- The choice of technique will depend on the project's needs and the availability of resources.

Conclusion

❑3.4 Feasibility Study:

- A feasibility study is conducted to assess the viability of the project, considering technical, economic, operational, and schedule feasibility.
- It helps to identify potential risks, challenges, and constraints that may impact the success of the project.

❑3.5 Steps Involved in Feasibility Analysis:

The steps involved in feasibility analysis include identifying the project scope, defining the proposed system, conducting a cost-benefit analysis, and evaluating the project's risks and benefits.

❑3.6 Types of Feasibilities:

There are three types of feasibilities: technical feasibility, economic feasibility, and operational feasibility.

- Technical feasibility assesses whether the proposed system can be developed and implemented with the available technology and resources.
- Economic feasibility evaluates the financial viability of the project, considering costs, benefits, and return on investment.
- Operational feasibility evaluates whether the proposed system is acceptable and practical for stakeholders, and whether it can be implemented within the constraints of the organization.
- Effective system planning is crucial to the success of any project, as it helps to ensure that the project is aligned with organizational goals, that the needs of all stakeholders are met, and that the project is completed on time and within budget.