SOFTWARE ENGINEERING

Assignment – 2

UNIT – 2 SEM- 2 , (DEP – IT)

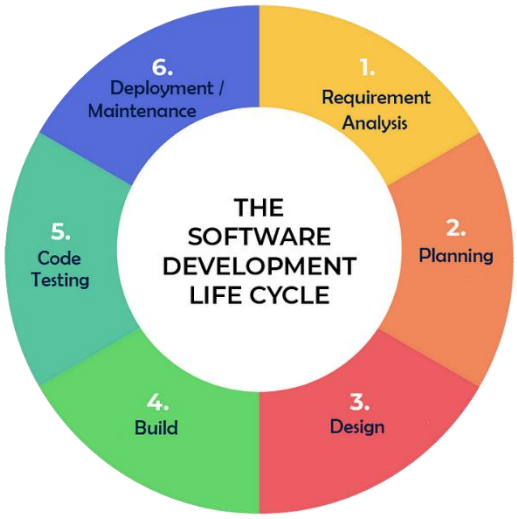
1. **What are Software Life Cycle Models?** **(Short Answers)**

Ans - Software Life Cycle Models are systematic approaches used in software engineering to manage the development of software applications. These models provide a structured framework for planning, designing, building, testing, and maintaining software systems.

2. **How many steps are there in the Software Development Life Cycle (SDLC)?**

Ans - 1. Planning

2. Analysis
3. Design
4. Implementation
5. Testing
6. Deployment
7. Maintenance



3. **Why is it important to select the appropriate life cycle model for a software project?**

Ans - 1. It ensures the development process fits the project's needs.

2. It helps manage resources efficiently.
3. It improves teamwork and communication.
4. It reduces risks by addressing issues early.
5. It satisfies customers by delivering what they expect.
6. Role is Clear
7. Lead to good software

4. **What are the key attributes defined by the Software Development Life Cycle (SDLC)?**

Ans - Software development life cycle (SDLC) also defines some key attributes:

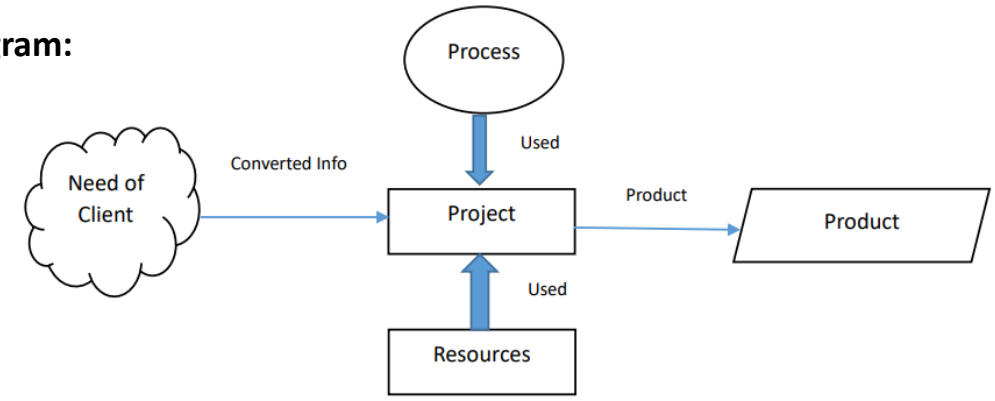
- **Role is clear**
- **Pre and post condition are understood and held true**
- **The outcome of the methods is key products**

By selecting the appropriate model based on project requirements, constraints, and objectives, software developers can better manage the complexities of the development process and deliver high-quality software products.

5. **Define software process with proper diagram**

Ans - A software process is like a recipe for making software. It is a series of ordered steps that developers follow to create a software product. These steps show how to produce software and provide a method for developing it. Each step in the process is done using specific tools and techniques. For a project to be successful, it needs to follow this systematic process.

Diagram:



6. **Describe the purpose of the Software Development Life Cycle (SDLC) and its impact on software development.** **(Long Answers)**

Ans - 1. Purpose of SDLC:

- Ensure systematic approach to software development.

- Provide a structured framework for managing the software development process.

- Improve the quality of software products.

- Enhance project management and resource utilization.

- Ensure timely delivery of software projects.

2. Impact on Software Development:

- Organizes tasks and workflows efficiently.

- Facilitates better communication among team members.

- Helps in identifying and mitigating risks early in the development process.

- Improves collaboration between development, testing, and deployment teams.

- Ensures adherence to requirements and customer expectations.

7. Explain the primary reasons for selecting a suitable life cycle model in software engineering

Ans - 1. Matching Project Needs:

- Different projects have different requirements and constraints.

- Choosing a suitable life cycle model ensures alignment with the project's specific needs and goals.

2. Resource Management:

- Each life cycle model allocates resources differently throughout the development process.

- Selecting an appropriate model helps optimize resource allocation, such as time, budget, and personnel.

3. Risk Management:

- Certain life cycle models are better suited for managing risks inherent in the project.

- Choosing the right model helps mitigate potential risks and uncertainties effectively.

4. Client Collaboration:

- Client involvement varies across different life cycle models.

- Selecting a model that accommodates the level of client interaction desired ensures satisfactory collaboration and feedback.

5. Product Complexity

- The complexity of the software product influences the choice of life cycle model.

- Models differ in their ability to handle complex requirements, development processes, and technical challenges.

6. Quality Assurance:

- Some life cycle models emphasize quality assurance and testing more than others.

- Selecting a model that prioritizes quality ensures the delivery of a reliable and robust software product.

8. Describe the different groups of SDLC models and classify them based on their characteristics.

Ans - 1. Sequential (or Traditional) Models:

- Follow a step-by-step, linear approach.

- Example: Waterfall model.

2. Iterative Models:

- Involve repeating cycles of development.

- Example: Spiral model.

3. Agile Models:

- Flexible and adaptive to change.

- Example: Scrum, Kanban.

4. Incremental Models:

- Build the software in stages.

- Example: Incremental model.

5. Hybrid Models:

- Combine elements from different models.

- Example: Scrum ban.

9. Compare the Waterfall Model, Iterative Model, Spiral Model, Big Bang Model, in terms of their characteristics, advantages, and disadvantages.

Ans - 1. Waterfall Model:

- **Characteristics:** Sequential approach with distinct phases (requirements, design, implementation, testing, deployment, maintenance).

- **Advantages:** Clear structure, easy to understand and manage, suitable for well-defined projects.

- **Disadvantages:** Limited flexibility to accommodate changes, late detection of issues, long delivery time.

2. Iterative Model:

- **Characteristics:** Repeated cycles of development, each producing a version of the software with additional features.

- **Advantages:** Allows for early delivery of partial functionality, accommodates changes and feedback, reduces risk through incremental development.

- **Disadvantages:** Requires frequent iteration planning and coordination, may lead to scope creep if not managed properly.

3. Spiral Model:

- **Characteristics:** Combines elements of both Waterfall and Iterative models, emphasizing risk analysis and incremental development.

- **Advantages:** Incorporates risk management from the beginning, accommodates changes, provides early prototypes for user feedback.

- **Disadvantages**: Complex to manage, requires thorough risk assessment and management expertise, can be time-consuming.

4. Big Bang Model:

- **Characteristics:** Minimal planning and documentation, development starts without detailed requirements.

- **Advantages**: Quick start, suitable for small projects with unclear requirements.

- **Disadvantages:** High risk of failure due to lack of planning, difficult to manage changes, may lead to chaotic development process.

10. Explain Iterative model in detail

Ans - The Iterative Model is like building with LEGO bricks:

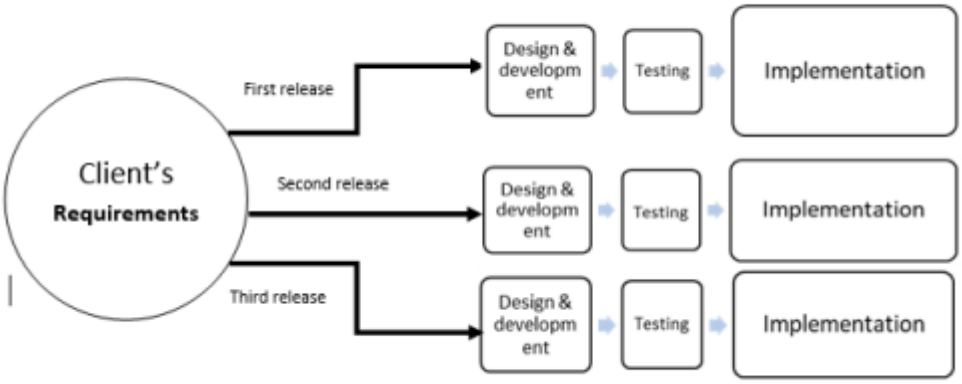
1. Start Small: Imagine you are building a LEGO set, but instead of trying to assemble everything at once, you start with a small section.

2. Add Piece by Piece: You add one piece at a time, making sure each piece fits and works well with the others.

3. Test and Adjust: After adding a few pieces, you check to see if everything is coming together as expected. If something does not fit right or does not look quite how you want it to, you adjust.

4. Repeat: You keep adding more pieces, testing, and adjusting until you have built the entire model. Each time you add new pieces, you are making the model better and better.

5. Final Touches: Once the model is complete, you might go back and make some final touches to polish it up and make sure everything is just right.



➢ **Problems of iterative model:**

- **This model is not suitable f**
- **or small development.**
- **It is hard to manage the entire process.**
- **A skilled team is needed to manage risk analysis.**
- **More resources are needed than a waterfall.**

THANK YOU SO MUCH, CREATED BY SAURABH

ALL THE BEST