

SYSTEM DESIGN, ENGINEERING AND TESTING SESSIONAL

Topic: Group Formation, Project Selection and SDLC Sessional - 01

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GROUP FORMATION, PROJECT SELECTION

Group Formation

- Each group have maximum of 3 members.
- Project Proposal should be submitted within 3 week

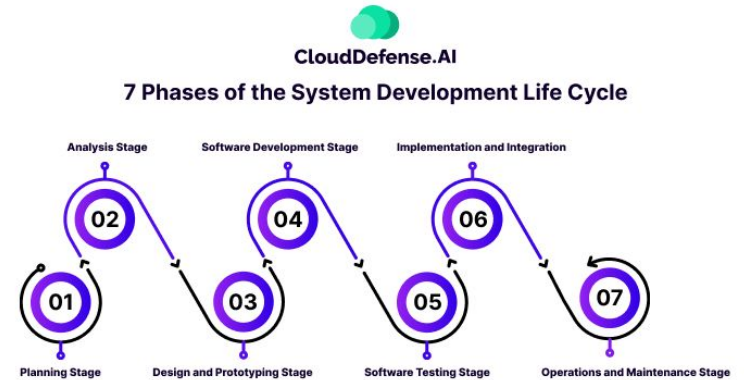
Project Selection

- You can choose your previous semester project or select a new one.
- You must follow the SDLC for your project.

This sessional mainly focuses on your own project applying the concept of System Design, Engineering and Testing.

INTRODUCTION TO SDLC

- The System Development Life Cycle (**SDLC**) provides a well-structured framework that gives an idea, of how to build a system.
- Stages (Phases) of System Development Life Cycle
 - **Stage 1:** Planning Stage
 - **Stage 2:** Feasibility or Requirements of Analysis Stage
 - **Stage 3:** Design and Prototyping Stage
 - **Stage 4:** Software Development Stage
 - **Stage 5:** Software Testing Stage
 - **Stage 6:** Implementation and Integration
 - **Stage 7:** Operations and Maintenance Stage



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Stage 1: Planning Stage

- Define the problem and scope of any existing systems.
- Determine the objectives for the new system.
- Develop an effective outline to catch potential problems early.
- Secure funding and resources needed for the project.
- Set the project schedule, especially important for commercial products.

Stage 2: Analysis Stage

- Gather specific details required for the new system.
- Define any prototype system requirements.
- Evaluate alternatives to existing prototypes.
- Perform research and analysis to determine end-user needs.
- Create a Software Requirement Specification (SRS) document.

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Stage 3: Design Stage

- Outline the details for the overall application.
- Specify user interfaces and system interfaces.
- Define network and database requirements.
- Convert the SRS document into a logical structure for implementation.
- Prepare a design document for reference in later phases.

Stage 4: Development Stage

- Write code and build the application according to design documents.
- Utilize Static Application Security Testing (SAST) tools.
- Follow coding guidelines defined by the organization.
- Use various tools like compilers, debuggers, and interpreters.
- Select appropriate programming languages based on project requirements.

Stage 5: Testing Stage

- Thoroughly test the software to identify any bugs.
- Track, fix, and retest defects.
- Ensure the software meets quality standards defined in the SRS document.
- Testing duration varies based on software complexity and developer skill.
- Implement best practices for software testing projects.

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Stage 6: Implementation and Integration Stage

- Integrate different modules or designs into the primary source code.
- Use training environments to detect further errors or defects.
- Integrate the information system into its environment.
- Install the software.
- Ensure the software is ready for market and provided to end-users.

Stage 7: Maintenance Stage

- Handle issues reported by end-users.
- Implement necessary changes after deployment.
- Address residual bugs not patched before launch.
- Resolve new issues reported by users.
- Maintenance duration varies based on system size and complexity.

BASIC SDLC METHODOLOGIES

Waterfall Model

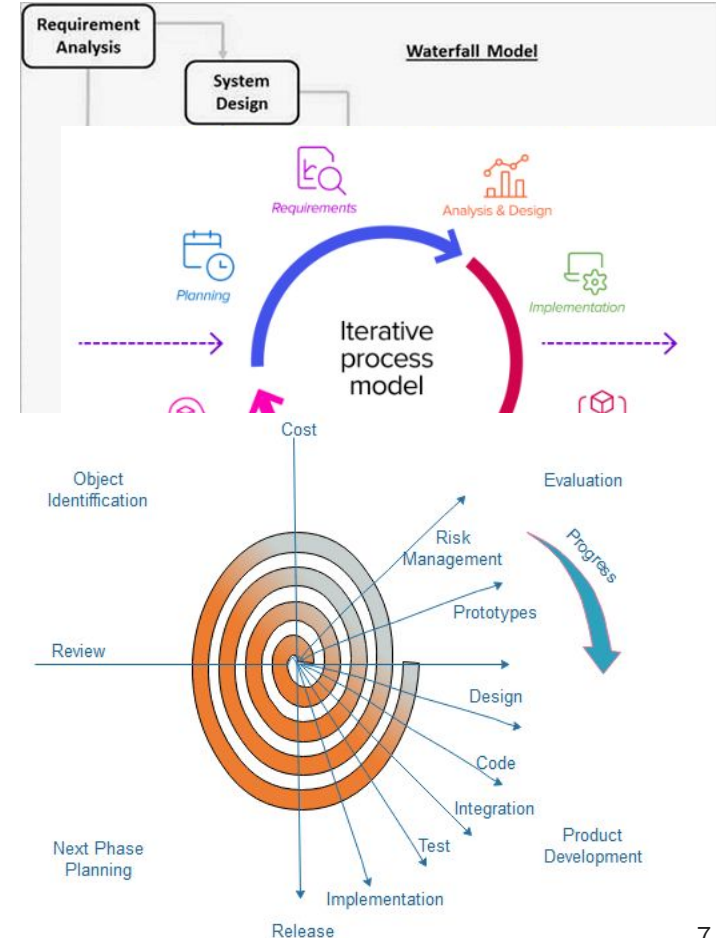
- A linear and sequential approach where each phase must be completed before the next one begins.
- Each stage has a separate project plan.
- Information flows from one stage to the next to avoid recurring issues.
- Vulnerable to early delays that can cause problems later.

Iterative Model

- Focuses on repetition and repeated testing.
- New versions are produced at the end of each phase to catch potential errors early.
- Allows constant improvement of the product.
- Implementing changes is often less expensive.

Spiral Model

- Flexible and suitable for large projects.
- Projects go through four main phases repeatedly in a spiral motion.
- Allows for customization and incorporation of feedback early in the life cycle.
- Ideal for large and complex projects.



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V-Model

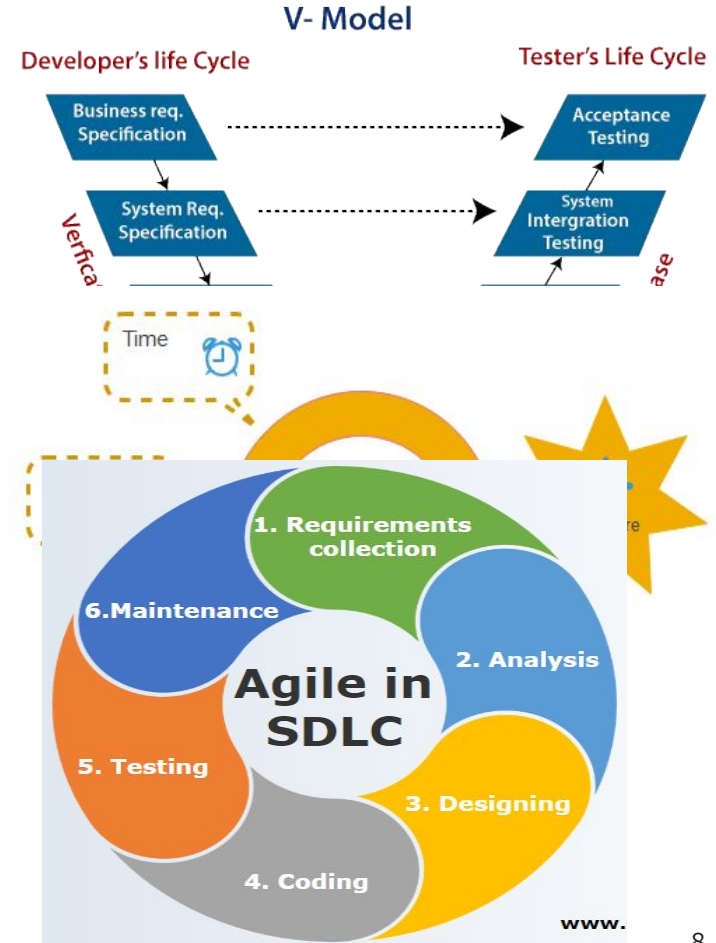
- Similar to the Waterfall model, but with a testing phase for each development stage.
- Focuses on verification and validation.
- Helps to catch bugs and defects early.
- Requires a disciplined and rigorous timeline.

Big Bang Model

- Extremely flexible and lacks a structured process.
- Minimal planning; developers start with money and resources.
- Suitable for projects where the client isn't sure what they want.
- Often used for smaller or experimental projects.

Agile Model

- Prioritizes fast and ongoing release cycles with incremental changes.
- Emphasizes iterative development and testing.
- Helps to address small issues as they arise.
- Well-known in the software development industry for its flexibility and adaptability.



FIND WHICH SDLC IS BEST SUITED FOR YOUR PROJECT

Brainstorm yourself and write down the reasoning to choose the SDLC. You have 20 minutes for this.

THANK YOU