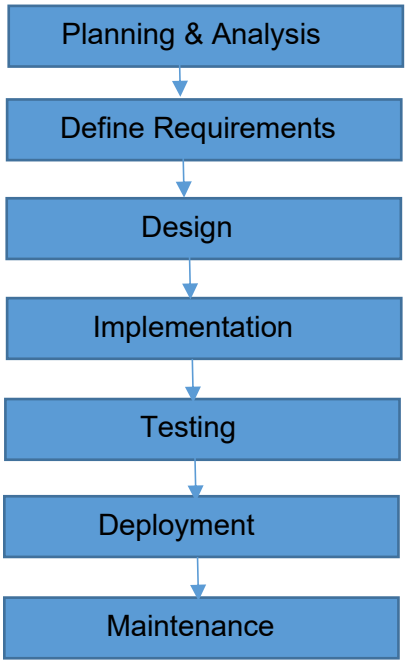
Software Development Life Cycle

- Software Development Life Cycle(SDLC) is a process that is used to develop ,design the software products.
- SDLC defines the whole procedure of software development step by step.



Phases of SDLC:

1)Planning & Analysis:

-> The first phase of the SDLC is the project planning stage where you are gathering business requirements from your client or stakeholders.

-> Requirement analysis is the most important and fundamental stage in SDLC. It is performed by the senior members of the team with inputs from the customer, the sales department, market surveys and domain experts in the industry.

2)Defining requirements:

-> Once the requirement analysis is done the next step is to clearly define and document the product requirements and get them approved from the customer or the market analysts.

->This phase is critical for converting the information gathered during the planning and analysis phase into clear requirements for the development team.

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3)Designing:

->The original plan and vision are elaborated into a software design document that includes the system design, programming language and platform to use.

->All the important stakeholders and based on various parameters as risk assessment, product robustness, design modularity, budget and time constraints, the best design approach is selected for the product.

4)Implementation:

->The actual development phase is where the development team members divide the project into software modules and turn the software requirement into code that makes the product.

->If the design is performed in a detailed and organized manner, code generation can be accomplished without much hassle.

5)Testing:

->If the design is performed in a detailed and organized manner, code generation can be accomplished without much hassle.

->However, this stage refers to the testing only stage of the product where product defects are reported, tracked, fixed and retested, until the product reaches the quality standards

6)Deployment:

->Once the product is tested and ready to be deployed it is released formally in the appropriate market. Sometimes product deployment happens in stages as per the business strategy of that organization.

->Then based on the feedback, the product may be released as it is or with suggested enhancements in the targeting market segment.

7)Maintenance:

->The maintenance phase is the final stage of the SDLC .

->In the maintenance stage, users may find bugs and errors that were missed in the earlier testing phase. These bugs need to be fixed for better user experience.

Software development life cycle models

1)Waterfall model

2)Spiral model

3)Iterative model

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4)V model

5)Incremental model

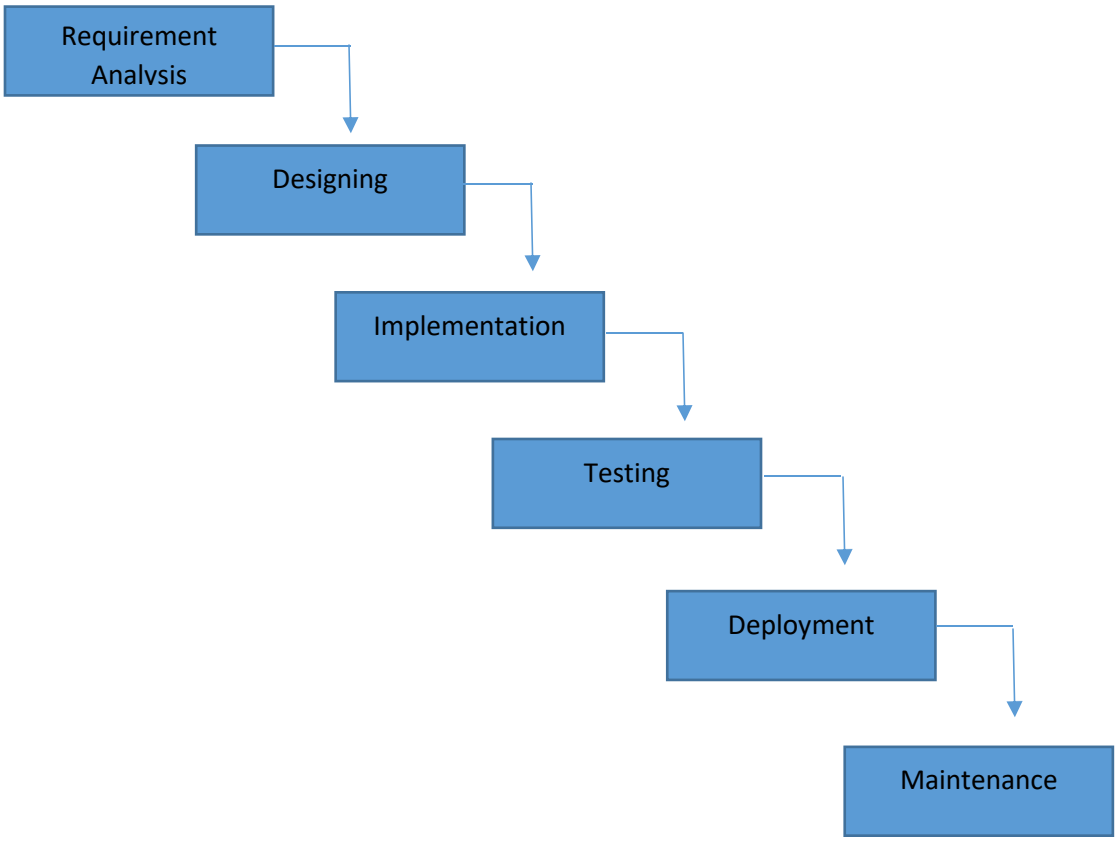
6)Agile model

Waterfall model:

The Waterfall model is one of the earliest approaches to software development and is often considered a classic model of the Software Development Life Cycle.

->It is a linear and sequential approach where each phase must be completed before the next one begins.

- Sequential phases.
- No overlapping phases.
- Clear documentation.



Spiral model:

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Spiral model is risk driven software development process model.

It is a combination of waterfall model ,Iterative model.

Software is developed in a series of incremental releases as per each spiral.

Divided into 4 parts:

1)Planning

2)Risk Analysis

3)Engineering and Execution

4)Customer Evaluation

Planning:

Communication between customers and project head.

Collect all the requirement from customers

Analysis estimated cost and schedule.

Risk Analysis:

Identification of all potential risks.

Strategy for solving risks

Engineering and Execution:

Developer perform actual coding

Tester perform all testing methods

Deploy or release product to the customer environment.

Evaluation:

Take a feedback from customers.

If customer want any changes,goes to next planning or next spiral iteration.

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Iterative model:

Starts with some requirement and analysis then develop first version of software.

If any changes,new versions are created.Again if any changes,new versions are created called as Iterations.After finalized,Deploy the product.

1)Requirement gathering and analysis

2)Design Phase

3)Coding Phase

4)Testing Phase

5)Review Phase

6)Deployment and Maintenance Phase

Incremental model:

Requirements are divided into multiple standalone modules of the software development cycle.

Each module goes through the requirements,design,implementation and testing phases.

The process continues until the complete system achieved.

V model:

In this each phase of the development life cycle is associated with Testing phase.

Testing of the software is planned in parallel with the corresponding phase of development.

Similar to waterfall model follow linear process,moves to next phase only after completing its preceding phase.

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Agile model:

It is an incremental and iterative process of software development.

Divides requirement into multiple iterations and provide specific functionality for the release.

Delivers multiple software requirements.Each iteration are lasts from two or three weeks.

Agile methods break tasks into smaller iterations, or parts do not directly involve long term planning. The division of the entire project into smaller parts helps to minimize the project risk and to reduce the overall project .

Product Planning

- This phase involves refining the product backlog, which is a prioritized list of features or user stories.
- Product owners, stakeholders, and the development team collaborate to clarify requirements, add details, and prioritize items for upcoming iterations.

Sprint Planning:

- At the beginning of each sprint, the team conducts a sprint planning meeting to select the items from the product backlog that will be worked on during the sprint.
- The team estimates the effort required for each selected item and defines the tasks necessary to implement them.

Development:

- During the sprint, the development team works on implementing the selected user stories or features.
- Developers collaborate closely with each other, as well as with testers, designers, and other stakeholders as needed.

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Daily Stand-up (or Daily Scrum):

- Agile teams typically hold daily stand-up meetings, where team members provide brief updates on their progress, discuss any impediments, and coordinate their work for the day.
- These meetings are time-boxed and help ensure that everyone is aligned and aware of the team's progress.

Continuous Testing:

- Throughout the sprint, developers integrate their code changes frequently, often multiple times per day.
- Automated tests are run continuously to detect and prevent regressions, ensuring that the software remains stable and functional.

Sprint Review:

- At the end of each sprint, the team holds a sprint review meeting to demonstrate the completed work to stakeholders.
- Stakeholders provide feedback on the delivered features, and the team discusses any changes or adjustments needed based on that feedback..

Release (or Deployment):

- Depending on the project's cadence and release strategy, the completed features may be deployed to production at the end of each sprint or accumulated for release at a later time.
- Continuous deployment practices may be employed to automate the release process and deliver new features to users quickly and frequently.