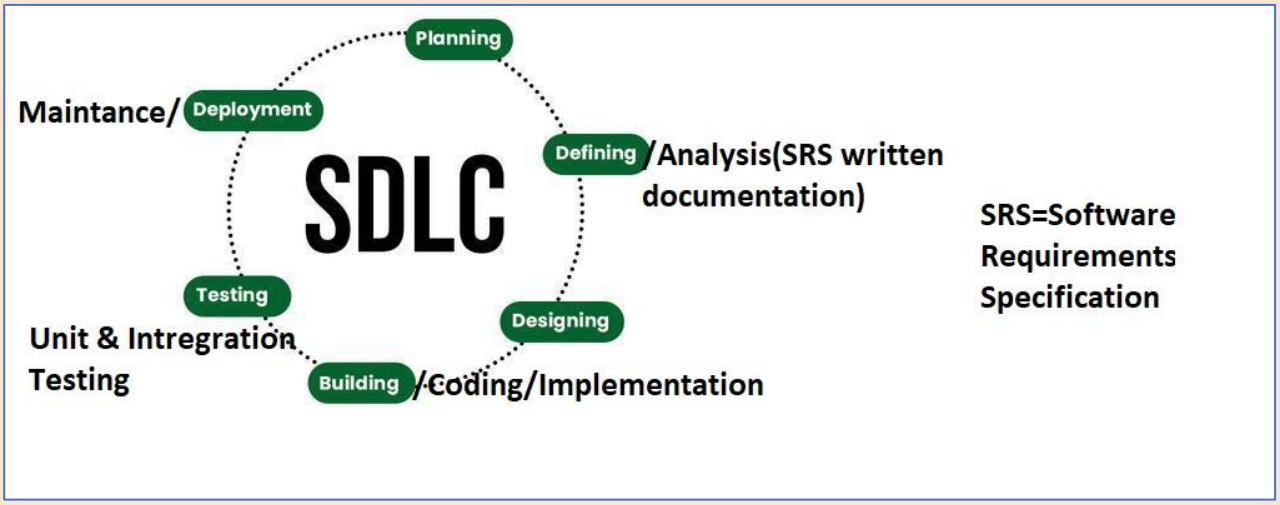
1. Software Development Life Cycle (SDLC)

Software development life cycle (SDLC) is a structured process that is used to design, develop, and test good-quality software.



LINK- https://www.geeksforgeeks.org/software-development-life-cycle-sdlc/

2. Software Engineering Basic Principles

Some of these principles include:

1. **Modularity:** Breaking down the software into smaller, independent, and reusable components or modules. This makes the software easier to understand, test, and maintain.
2. **Abstraction:** Hiding the implementation details of a module or component and exposing only the necessary information. This makes the software more flexible and easier to change.
3. **Encapsulation:** Wrapping the data and functions of a module or component into a single unit, and providing controlled access to that unit. This helps to protect the data and functions from unauthorized access and modification.
4. **DRY principle (Don't Repeat Yourself):** Avoiding duplication of code and data in the software. This makes the software more maintainable and less error-prone.
5. **KISS principle (Keep It Simple, Stupid):** Keeping the software design and implementation as simple as possible. This makes the software more understandable, testable, and maintainable.

LINK- https://www.geeksforgeeks.org/basic-principles-of-good-software-engineering-approach/

3.Top 8 Software Development Life Cycle (SDLC) Models used in Industry

1. Waterfall Model (Classical & Iterative Waterfall)

2. V-shaped Model

3. Prototyping Model

4. Incremental Model

5. Evolutionary Model

6. RAD (Rapid Application Development) Model

7. Spiral Model

8. Agile Development Models

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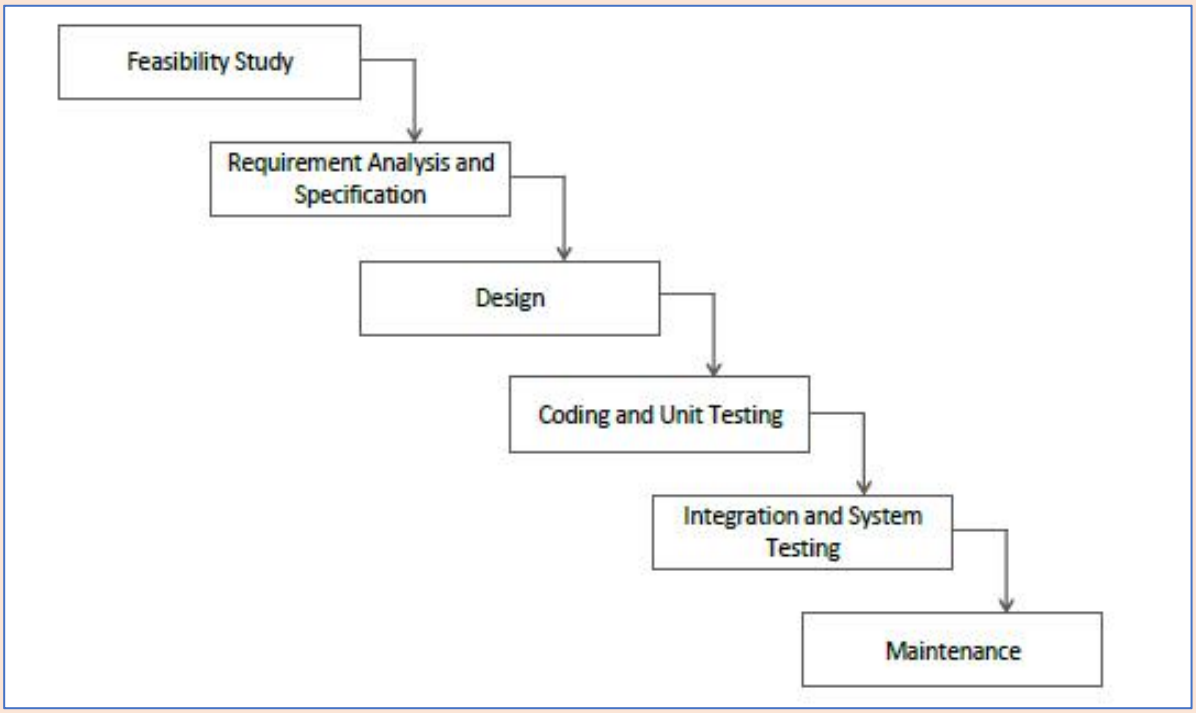
1. Waterfall Model

(Classical Waterfall Model)



Link- https://www.geektonight.com/classical-waterfall-model-software-engineering/

(Iterative Waterfall Model)

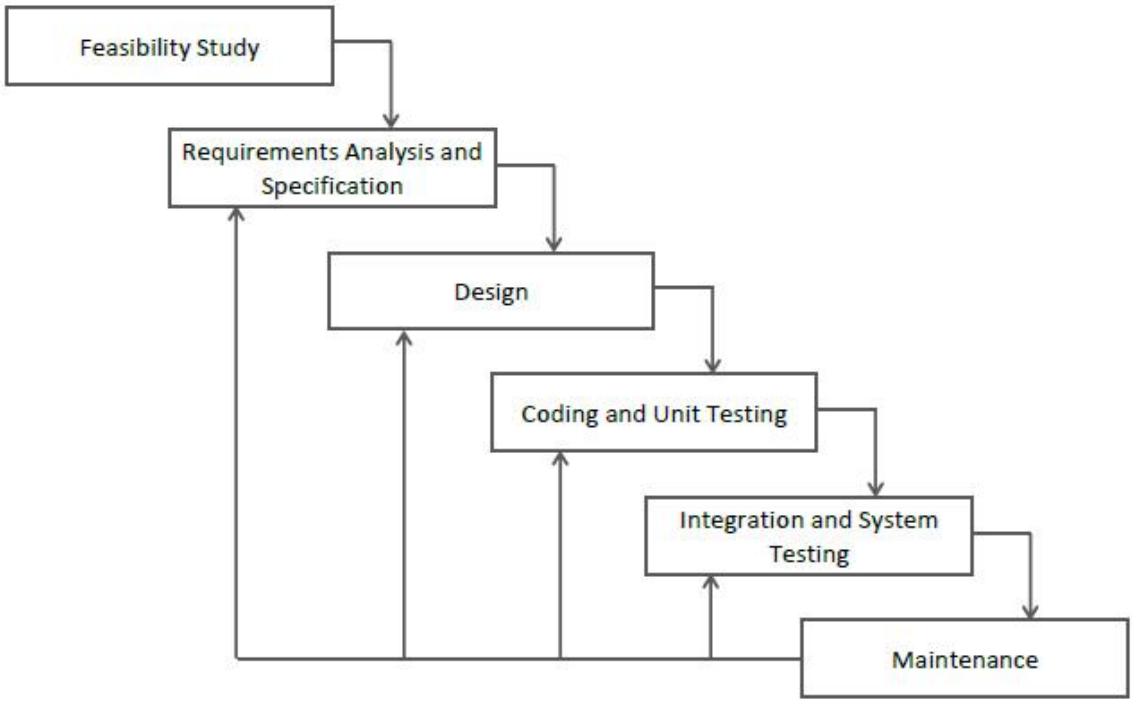


Figure 2: Iterative Waterfall Model

Link- https://www.geektonight.com/iterative-waterfall-model-software-engineering/

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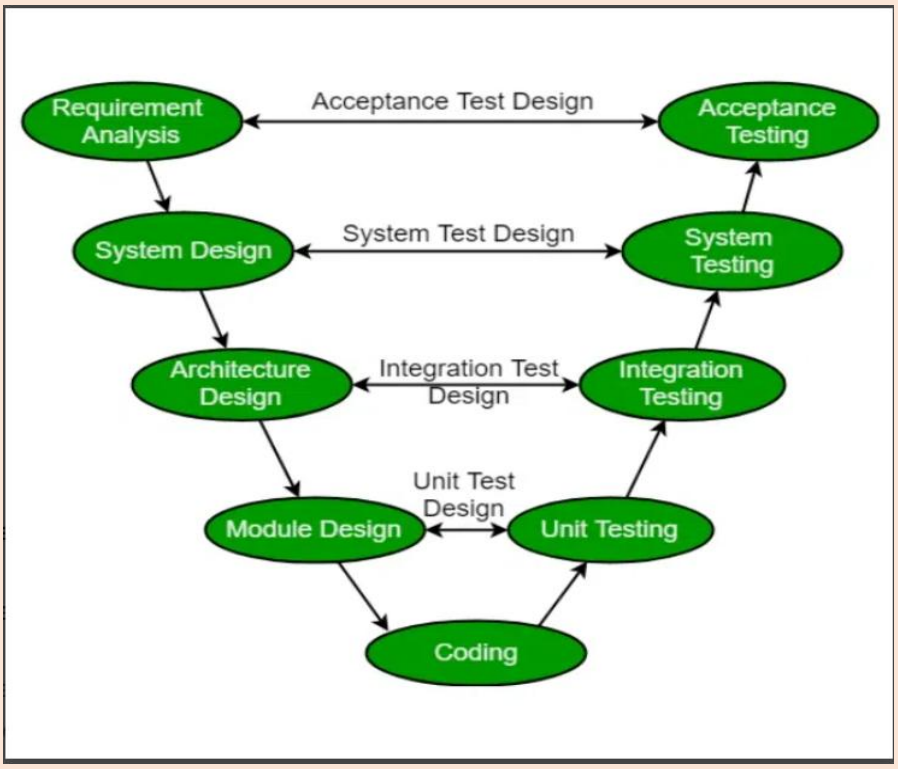
2. V-shaped Model

It is also known as the Verification & Validation Model.

Here Verification means step-by-step checking and Validation means check after completion of full project.

The V-model in software development is a **parallel model** that allows for parallel **validation** and **verification** at each step. The V-model is a sequential execution model that has a corresponding **testing phase for each development phase**.



LINK- https://www.geeksforgeeks.org/software-engineering-sdlc-v-model/

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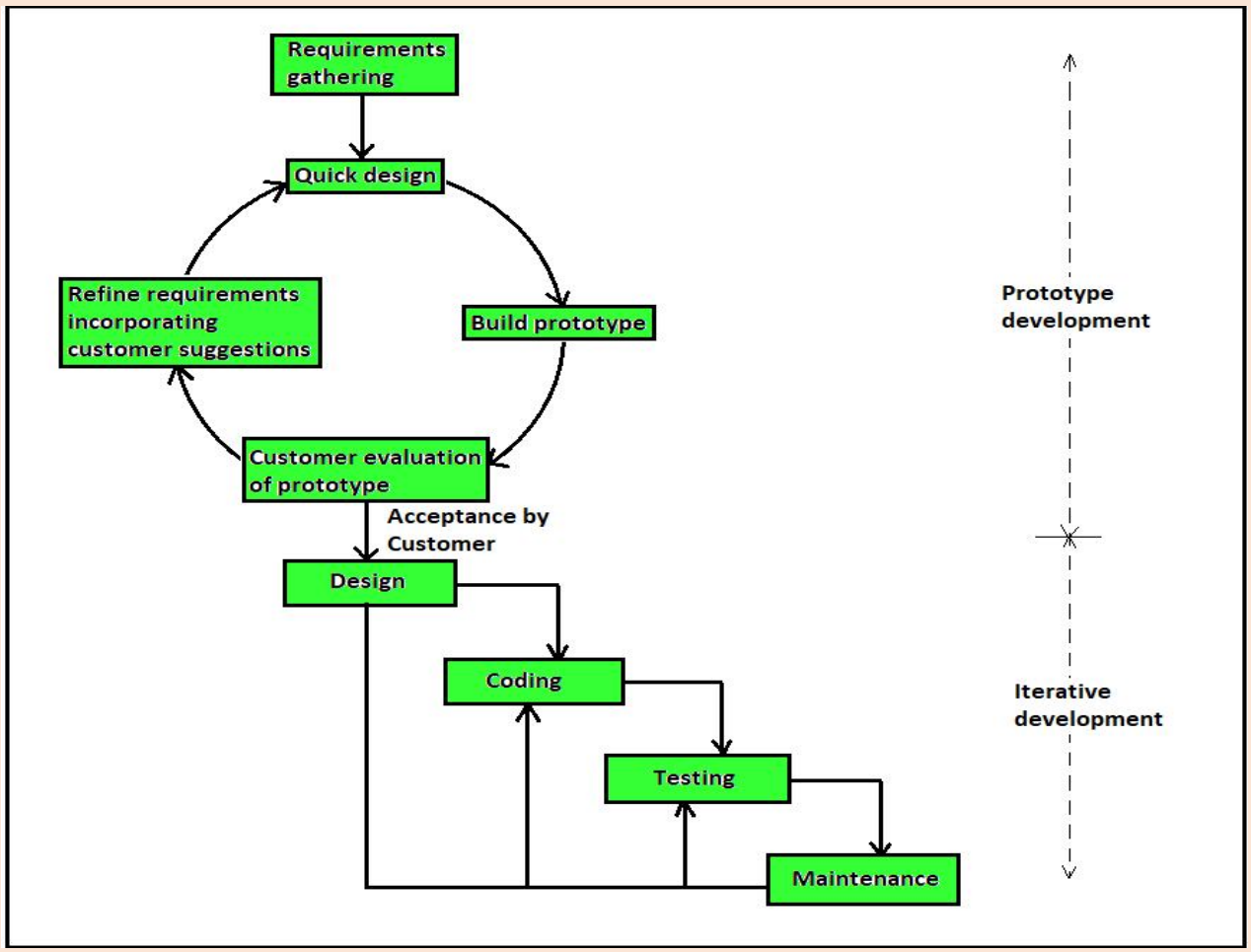
3. Prototyping Model



Link- https://www.geeksforgeeks.org/software-engineering-phases-prototyping-model-set-2/

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4. Incremental Model

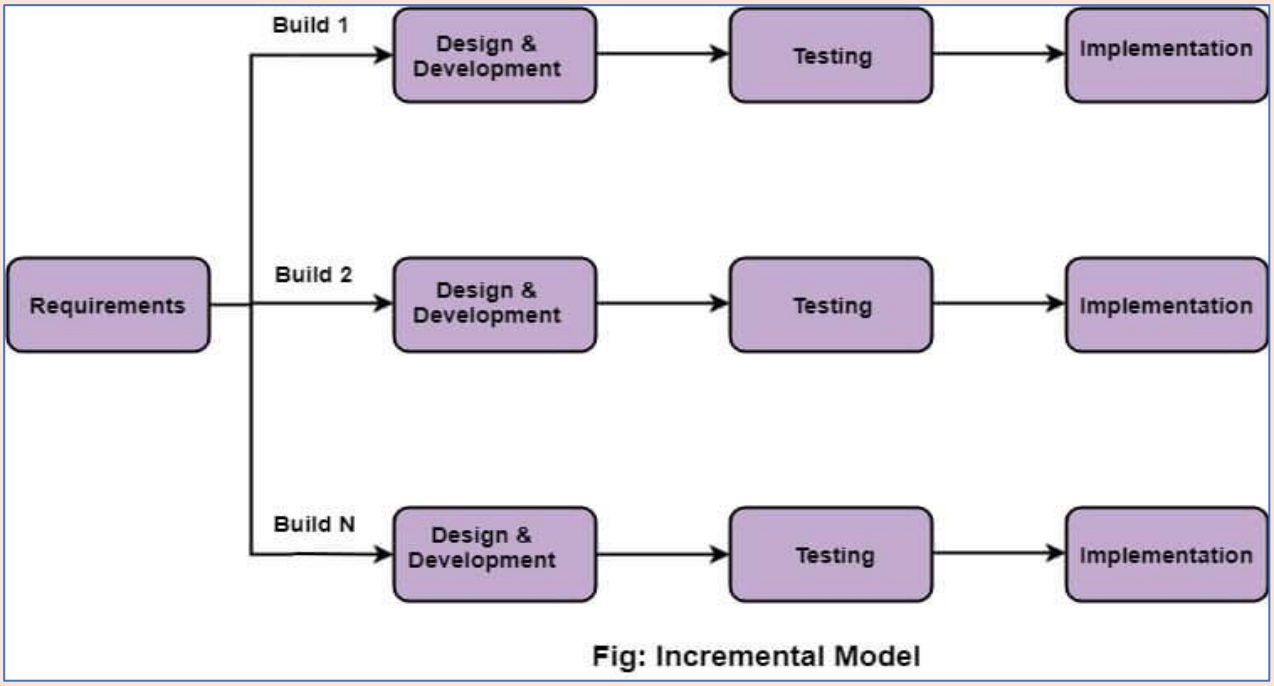
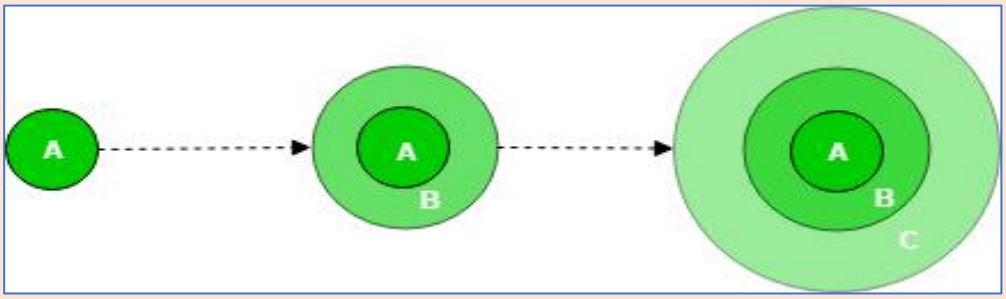


Fig: Incremental Model

LINK- https://www.javatpoint.com/software-engineering-incremental-model



Link- https://www.geeksforgeeks.org/software-engineering-incremental-process-model/

5. Evolutionary Model

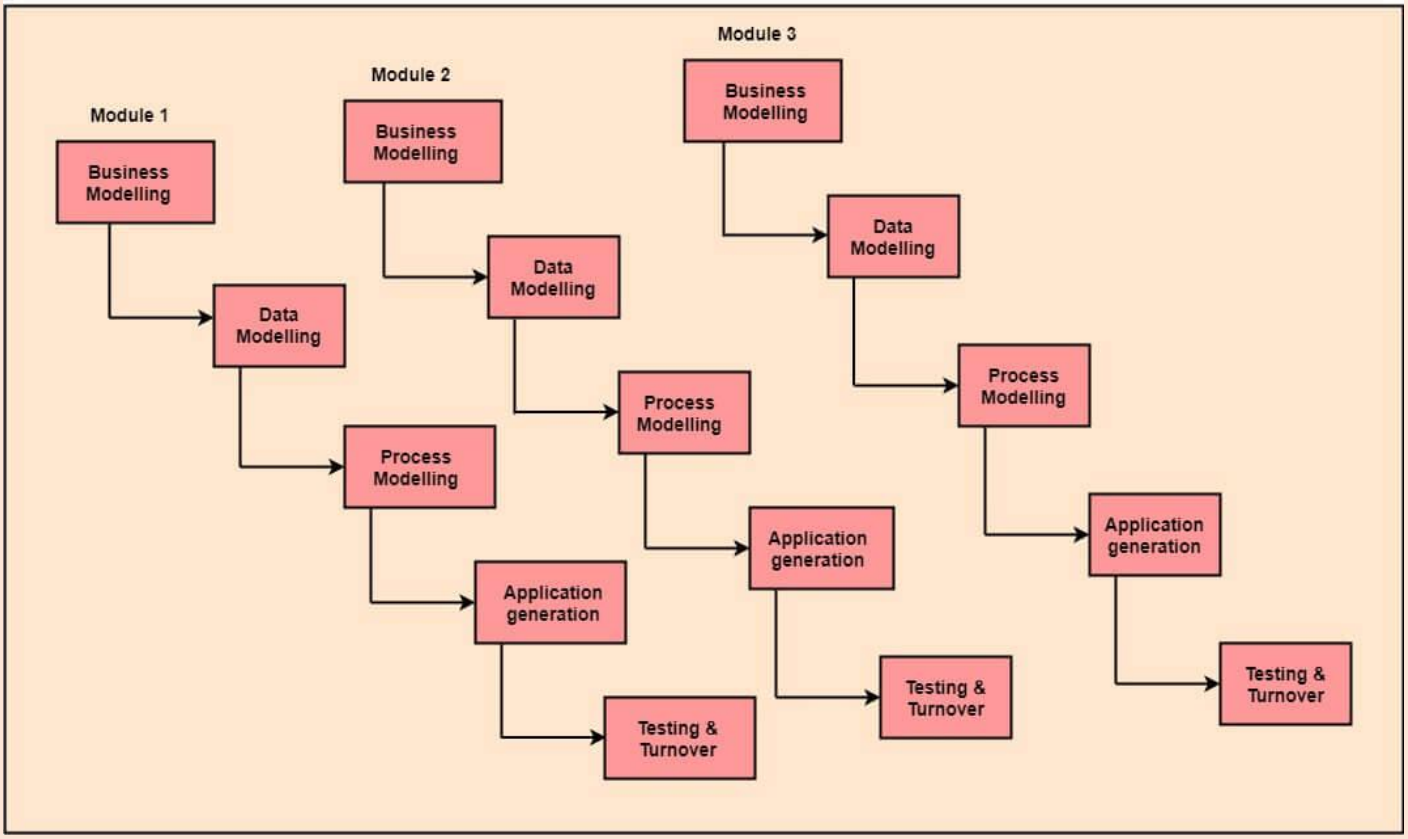
The evolutionary model is a combination of the Iterative and Incremental models of the software development life cycle.

LINK- https://www.geeksforgeeks.org/software-engineering-evolutionary-model/

6. RAD (Rapid Application Development) Model

It is Based on ‘Time’ and It is ‘Parallel Computing’.

Fig: RAD Model



LINK- https://www.javatpoint.com/software-engineering-rapid-application-development-model

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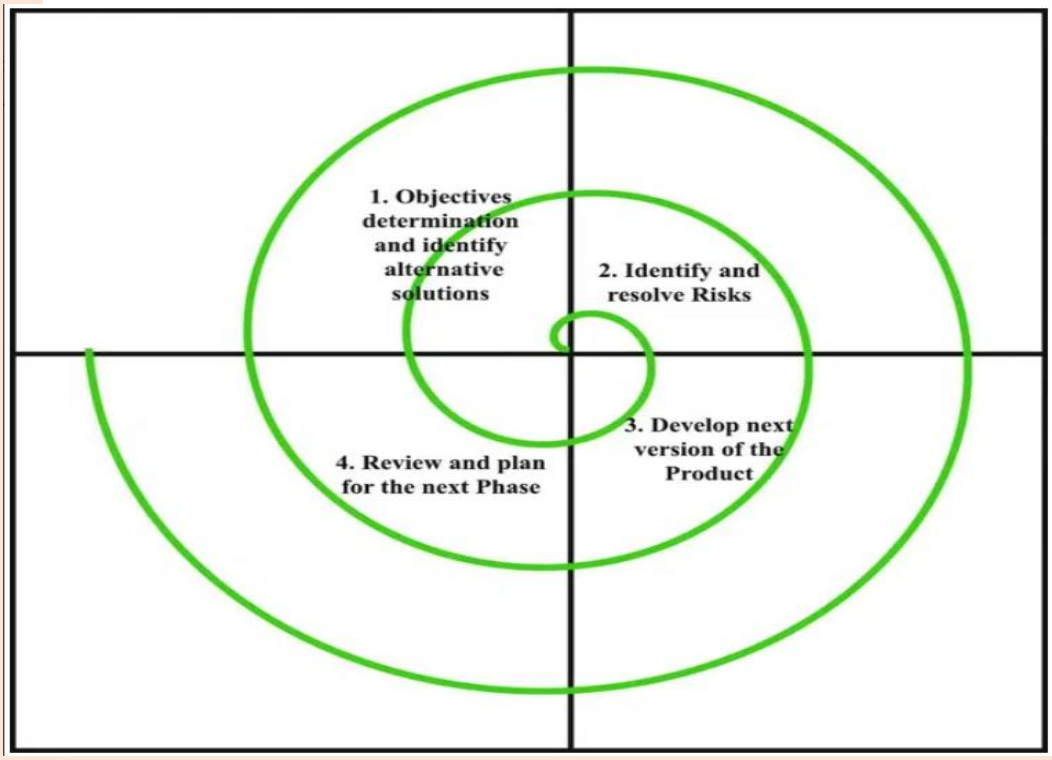
7. Spiral Model

The Spiral Model is a risk-driven model, meaning that the focus is on managing risk through multiple iterations of the software development process.

The spiral model is called a **meta model** because it incorporates other software development life cycle (SDLC) models. These models include:

- Iterative waterfall model
- Prototyping model
- Evolutionary model



Link- https://www.geeksforgeeks.org/software-engineering-spiral-model/

SEE THIS VIDEO PLAYLIST:

https://www.youtube.com/watch?v=uJpQlyT_CK4&list=PLxCzCOWd7aiEed7SKZBnC6ypFDWYLRvB2

8. Agile Development Models (Move Quickly)

The Agile Model was primarily designed to help a project adapt quickly to change requests. So, the main aim of the Agile model is to facilitate quick project completion.

Agile methodology focuses on frequent iterations, quick market releases, and feedback incorporation for continuous improvement. It emphasizes face-to-face client communication, rapid changes, and minimal documentation for efficient product development.

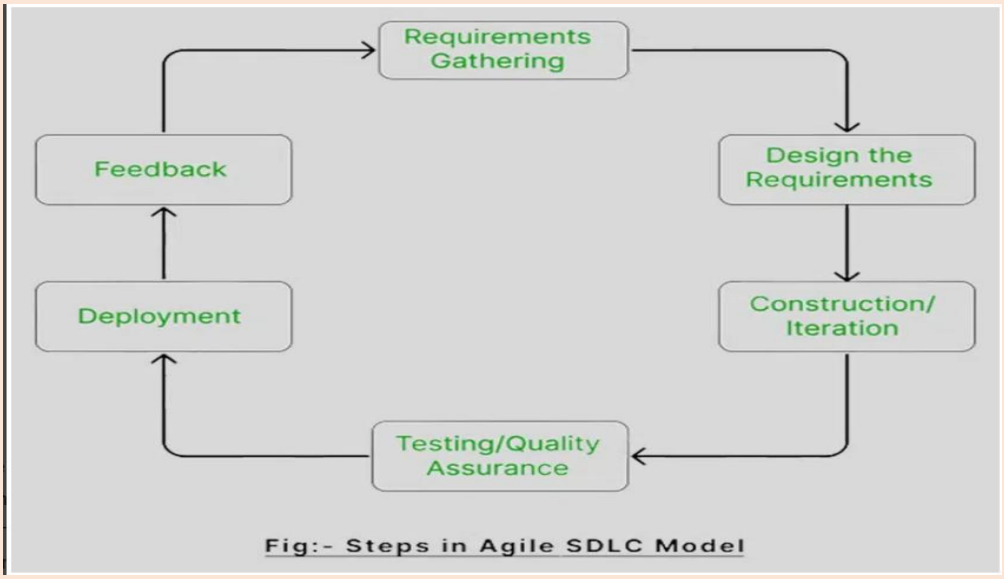


Fig:- Steps in Agile SDLC Model

LINK- https://www.geeksforgeeks.org/software-engineering-agile-development-models/

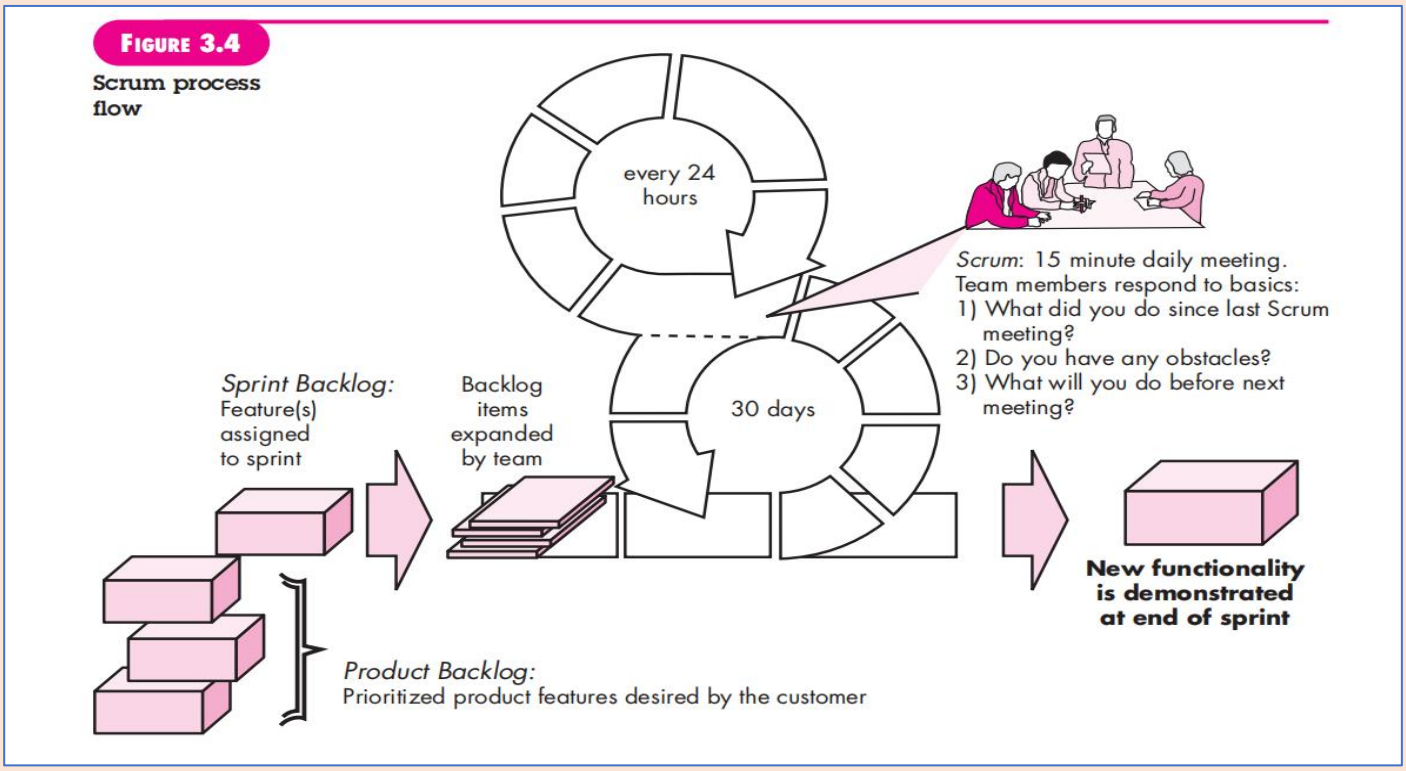
some examples of Agile methodologies:

- Scrum
- Kanban
- Feature Driven Development (FDD)
- Dynamic Systems Development Method (DSDM)
- Large-scale scrum (LeSS)
- Scrumban
- eXtreme Programming (XP)
- Adaptive Software Development (ASD)
- Crystal
- Lean Software Development (LSD)

>>SCRUM (Limited Time):

>>Scrum (the name is derived from an activity that occurs during a rugby match) is an agile software development method.

>>Main Moto of SCRUM We have to put maxium effort with in less time.
>>It is Lightweight, iterative & incremental framework.
>>It is Non-continuous process.



KEY-WORDS
>>SPRINT: It means breakdown the development phases into stages or cycle.
>>SCRUM-TEAM has scrum-master & product owner with const communication on daily basis
>>Backlogs (It means Pending Works): In Scrum, a backlog is a prioritized list of work that the development team needs to complete. This is typically known as the Product Backlog.
>>Daily Scrum: 10-15 minutes daily meeting here also employee work freedom & work adaption present Means employee can give their idea to the Scrum-Master(Team Leader).
>>SCRUM-MASTER: A Scrum master is a leader who guides a team through a project using Scrum, an Agile framework for developing complex projects and Scrum master also work with the team-member/employee.
>>Product Owner: As a member of the Scrum Team, the Product Owner provides clarity to the team about a product's vision and goal.
>>Advantages:
Freedom & Adaption
High-Quality, low-risk product
Reduce the development time upto 40%
Scrum-Customer Satisfied is very important
>>Disadvantages:
More Efficient for Small Size Team
No Changes on Sprint means onces work is assigned to the team member later on we can not change the assigned work

>>Kanban:

>>Kanban or Kanbam is a Japanese word which translate to signboard is Visual System that is used for managing work as it goes through the process.

>>The Main Moto of Kanban can help determine the bottlenecks, fix them in cost-effective manner

>>It is a Continuous process.

LINK- https://www.spiceworks.com/tech/devops/articles/what-is-agile-software-development/

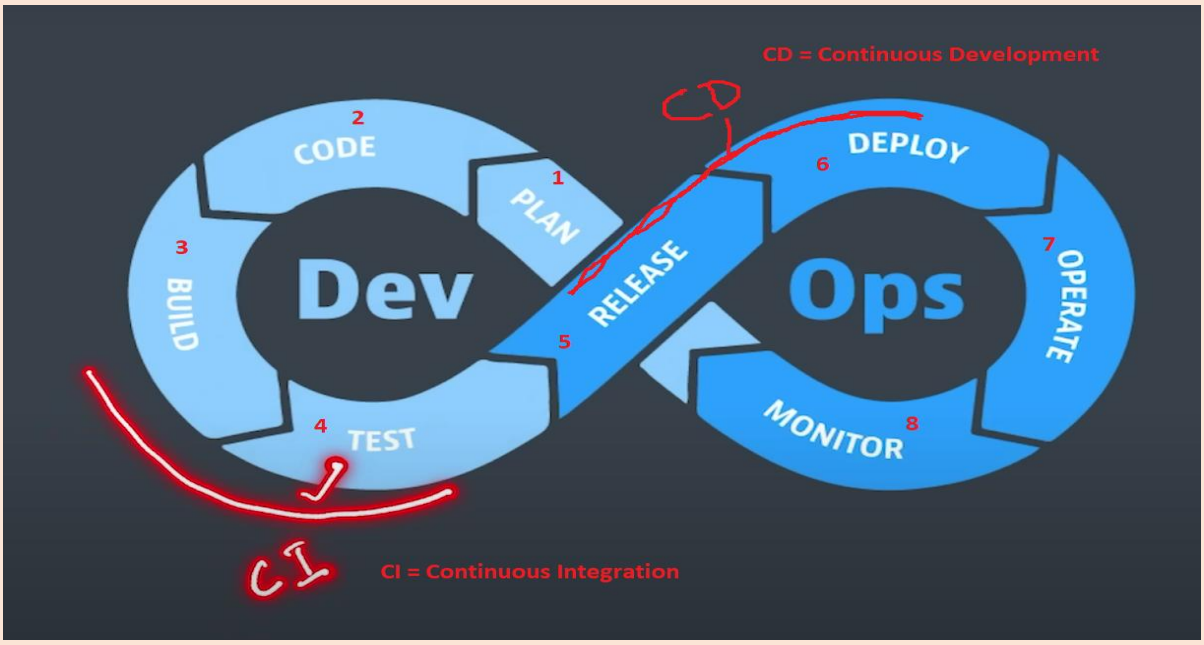
LINK OF YOUTUBE VIDEO: https://www.youtube.com/watch?v=WjwEh15M5Rw&list=PPSV

	SCRUM	KANBAN
Release methodology	Regular fixed-length sprints (i.e., two weeks)	Continuous flow
Roles	Product owner, scrum master, development team	Continuous delivery or at the team's discretion
Key metrics	Velocity	Cycle time
Change philosophy	Teams should strive not to change the sprint forecast during the sprint. Doing so compromises learning around estimation.	Change can happen at any time

Difference Link- https://www.youtube.com/watch?v=rIaz-l1Kf8w&list=PPSV

DEVOPS:

DevOps is a concept/process that bridges development team and operations team/departments in software development, ensuring collaboration and cost reduction. Small companies may combine these functions, but larger corporations separate them for efficiency.



LINK- https://www.youtube.com/watch?v=h7LDnVsNRVI