**SDLC MODELS**

**Waterfall Model:**

Waterfall model is one of the oldest Software Development methodology which follows sequential and incremental approach. In waterfall there are at least 6 phases of development. the six phase are requirements analysis, design, implementation, testing, deployment, and maintenance. And most important things is each phase is completed before moving to next phase, and no change or revision are done once a phase is completed.

Advantages:

* It is very simple and easy to understand.
* Works well for small projects.
* Phases in waterfall model are processed one at a time.

Disadvantages:

* Not well suited where requirements keeps on changing.
* Not well suited for large and complex projects.
* No error detection present at each stage.

Applications :

* Constructing a building
* Mobile Applications

**Agile Model:**

Agile Software Development is a software development methodology that values flexibility, collaboration, and customer satisfaction. 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.

Advantages:

* Provides faster delivery of software products and features
* It focuses mainly on customer satisfaction
* Changers in requirements are accepted even at later stages of the project.

Disadvantages:

* Requires high level of expertise from team members
* Not suitable for larger and complex projects
* For complex projects the requirements are difficult to estimate.

Applications:

* TV channel providers(TATA Sky, Airtel)
* Banking System
* Healthcare

**Spiral Model:**

The Spiral Model is one of the most important Software Development Life Cycle models. The Spiral Model is a combination of the waterfall model and the iterative model. It provides support for Risk Handling.

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

* Planning: The first phase of the Spiral Model is the planning phase, where the scope of the project is determined and a plan is created for the next iteration of the spiral.
* Risk Analysis: In the risk analysis phase, the risks associated with the project are identified and evaluated.
* Engineering: In the engineering phase, the software is developed based on the requirements gathered in the previous iteration.
* Evaluation: In the evaluation phase, the software is evaluated to determine if it meets the customer’s requirements and if it is of high quality.
* Planning: The next iteration of the spiral begins with a new planning phase, based on the results of the evaluation.

Advantages:

* Risk Handling at every phase.
* Well suited for large projects
* Change requests at later stages of the project building can be easily handled.

Disadvantages:

* It is much more complex than other SDLC models
* It is very expensive
* As the number of phases unknown at the start of the project, time estimation is very difficult.

Applications:

* Air Traffic Control System.
* Satellites building and activities.

**V-Model:**

The V-model is the most important model that is used in the process of software testing. It is also known as a verification and validation model.

V-model is a sequential process in which the next phase begins only after the completion of the present phase. In this model, steps don’t move in a linear way while the steps are bent upwards.

It is based on the association of a testing phase for each corresponding development stage. The development of each step is directly associated with the testing phase. The next phase starts only after completion of the previous phase i.e., for each development activity, there is a testing activity corresponding to it.

Advantages:

* Highly disciplined model and phases are completed one at a time.
* Used for small projects where project requirements are clear.
* Simple and easy to understand and use.

Disadvantages:

* High Risk and uncertainty.
* Not good for complex and object-oriented projects.
* Model does not support iteration of phases.

Applications:

* Aerospace Systems
* Defence Systems
* F1 cars building