V-model

In software development, the **V-model** represents a development process that may be considered an extension of the waterfall model, and is an example of the more general V-model. Instead of moving down in a linear way, the process steps are bent upwards after the coding phase, to form the typical V shape. The V-Model demonstrates the relationships between each phase of the development life cycle and its associated phase of testing.

Each Work-product activity is completed before moving to the next.

Needs a process to ensure that quality is brought throughout the whole development process.

Left-hand side focuses on elaborating the requirements like :

- Requirement specification
- Functional specification
- Technical specification
- Program specification

The right side of the "V" represents integration of parts and their validation.

- Testing against the requirement specification takes place at the acceptance testing stage.
- Testing against the functional specification takes place at the system testing stage.
- Testing against the technical specification takes place at the integration testing stage.
- Testing against the program specification takes place at the unit testing stage.

In the V-model, each stage of verification phase has a corresponding stage in the validation phase.

The verification phase includes:

- Requirements analysis
- System design
- Architecture design
- Module design

The validation phase includes:

- Unit testing
- Integration testing
- System testing

- User acceptance testing

Advantages:

- Suited for Restricted Projects:In situations where the project length and scope are well-defined, the technology is stable, and the documentation & design specifications are clear, the V-Model can be a great method.
- Ideal for Time Management: Along the same vein, V-Model is also well-suited for projects that must maintain a strict deadline and meet key milestone dates throughout the process.

Disadvantages:

- Lacks Adaptability: Similar to the issues facing the traditional waterfall model on which the V-Model is based, the most problematic aspect to the V-Model is its inability to adapt to any necessary changes during the development life cycle.
- Ill-Suited for Lengthy Life Cycles: Like the waterfall model, the V-Model is completely linear and thus projects cannot be easily altered once the development train has left the station. V-Model is therefore poorly suited to handle long-term projects that may require many versions or constant updates/patches.