

V-Model of Software Testing

Also known as the verification and validation model, the V-model. This requires that each stage of the SDLC be completed before moving on to the next. The waterfall model's sequential design approach is also followed. The device's testing is scheduled concurrently with the relevant stage of development.

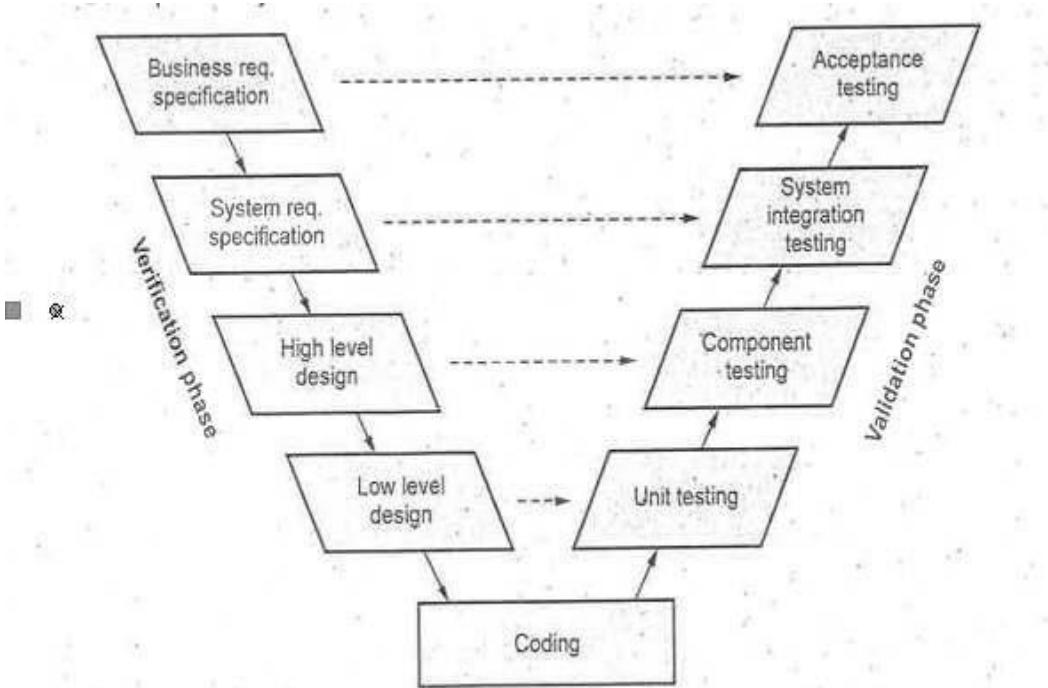


Fig. 1.5.1 V - model

Verification is a static analysis technique (review) carried out without actually running any code. To determine if certain criteria are met, the product development process is evaluated.

Testing is done by running code and validation comprises dynamic analysis methods (functional and non-functional). After the development phase is complete, the software is categorized through the validation step to see whether it satisfies the needs and expectations of the client.

Therefore, the V - model features validation stages on one side and verification phases on the other. Coding phase joins the verification and validation processes in a V-shape. As a result, it is known as V - model.

Play video in backward skip 10s there are many stages in the V - model's verification phase:

1. Business requirement analysis: This is the initial phase in which customer-side product needs are understood. To fully comprehend the expectations and precise needs of the consumer, this step involves comprehensive discussion.

2. System design: System engineers utilize the user requirements document to analyze and comprehend the business of the proposed system at this level.

3. Architecture design: The first step in choosing an architecture is to have a solid understanding of everything that will be included, such as the list of modules, a short description of each module's operation, the linkages between the modules' interfaces, any dependencies, database tables, architectural diagrams, technological details, etc. A certain step includes the integration testing model.

4. Module design: The system is divided into manageable modules during the module design phase. Low-level design, which is the specification of the modules' intricate Design.

5. Coding step: The coding step 'is started after designing. It is determined on a programming language that will work best based on the criteria. For coding, there are certain rules and standards. The final build is enhanced for greater performance prior to checking it into the repository and the code undergoes several code reviews to verify its performance.

There are many stages in the V - model's validation phase:

1. Unit testing: Unit Test Plans (UTPs) are created in the V - model's module design phase. To get rid of problems at the unit or code level, these UTPs are run. The smallest thing that can exist on its own is a unit, such a program module. Unit testing ensures that even the tiniest component can operate properly when separated from other scripts or units.

2. Integration testing: During the architectural design phase, integration test plans are created. These experiments demonstrate that separate groups may live and interact with one another.

3. System testing: During the system design phase, plans for system tests are created. System test plans, in contrast to unit and integration test plans, are created by the client's business team. System testing makes ensuring that an application developer's requirements are satisfied.

4. Acceptance testing: The examination of business requirements is connected to acceptance testing. The software product is tested in a user environment. Acceptance tests highlight any system compatibility issues that may exist within the user environment. Additionally, it identifies non-functional issues like load and performance flaws in the context of actual user interaction.

When to use V - model?

- When the requirement is well defined and not ambiguous.
- The V-shaped model should be used for small to medium-sized projects where requirements are clearly defined and fixed.
- The V-shaped model should be chosen when sample technical resources are available with essential technical expertise.

Advantage (Pros) of V - model:

- Easy to understand.
 - Testing methods like planning, test designing happens well before coding.
 - This saves a lot of time. Hence a higher chance of success over the waterfall model
 - Avoids the downward flow of the defects.
 - Works well for small plans where requirements are easily understood.
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Disadvantage (Cons) of V - model:

- Very rigid and least flexible.
- Not good for a complex project.
- Software is developed during the implementation stage, so no early prototypes of the software are produced.
- If any changes happen in the midway, then the test documents along with the required documents, has to be updated.