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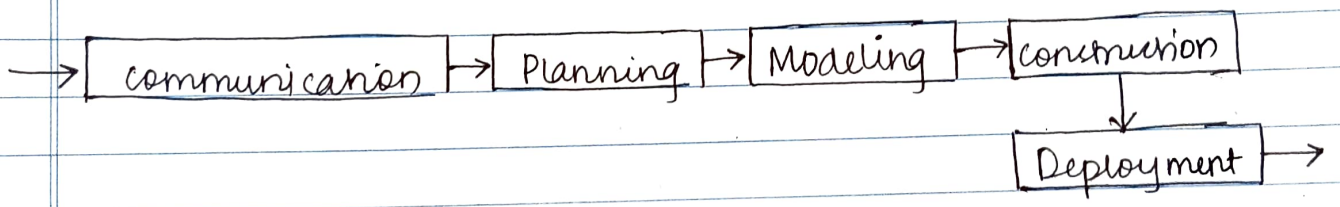
THADOMAL SHAHANI TSEC ENGINEERING COLLEGE

SOFTWARE ENGINEERING & PROJECT MANAGEMENT

(1) WATERFALL MODEL

The waterfall model sometimes called the classic life cycle suggests a systematic, sequential approach to software development that begins with customer specification of requirements and progresses through planning, modeling construction and deployment culminating in ongoing support of the completed software.

A variation in representation of the waterfall model is called the V-model



The waterfall model

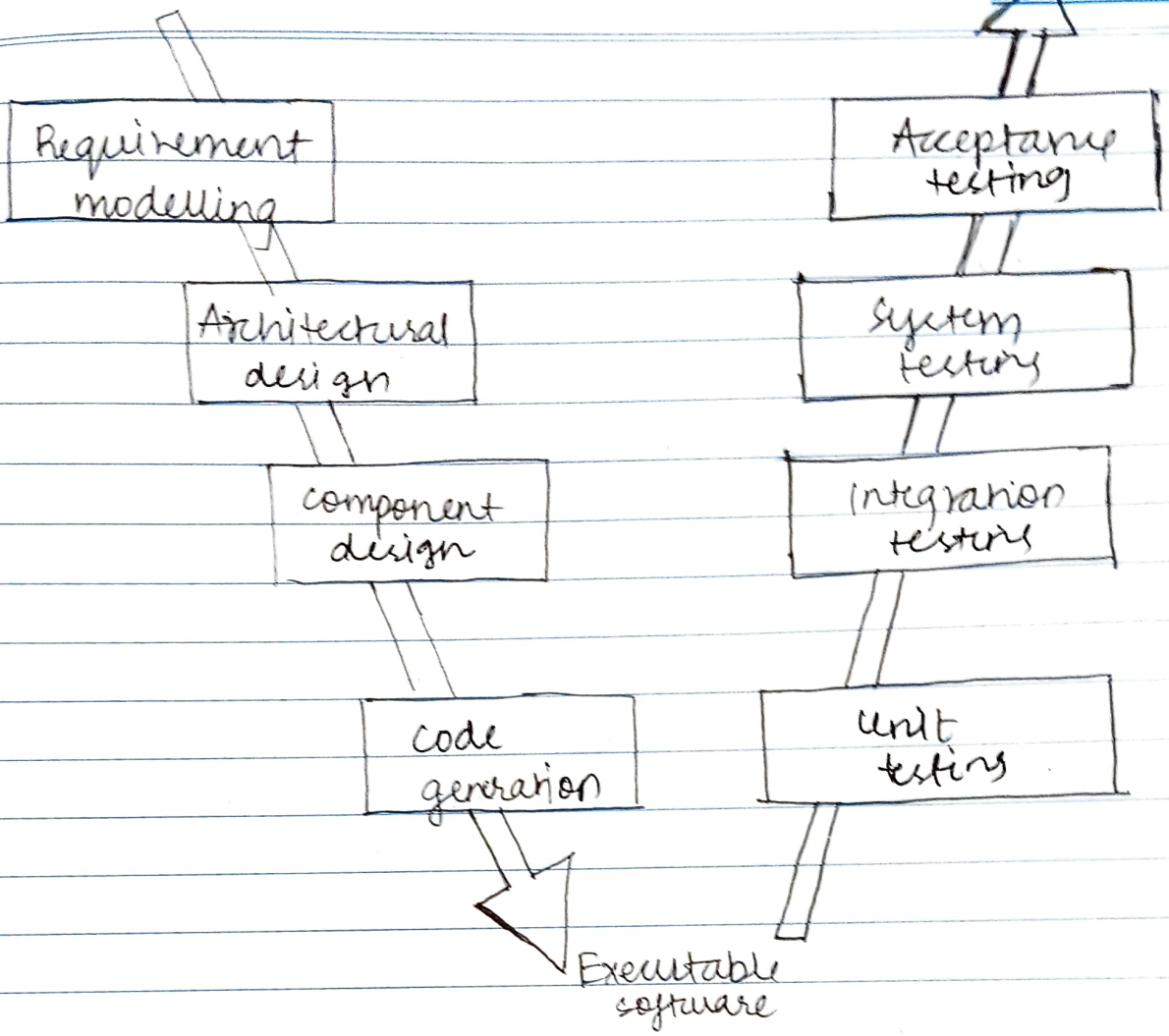
* Advantages
  - Simple and easy to understand
  - Easy to manage
  - Best for smaller projects
  - Individual processing.

* Disadvantages
  - Inflexible
  - Late testing
  - Not suitable for ensuring projects
  - lengthy development cycle.

For example:
In a library management system, phases include requirement analysis, system design implementation testing deployment and maintenance. Once a phase is finished, it doesn't return to previous stages.

When to use Waterfall Model?
- Well understood requirements
- Very little changes expected
- Small to medium size projects
- client prefers a linear & ~~requi~~ sequential approach
- Limited Resources.

(2) V MODEL
A variation in the representation of the waterfall model is called the V-Model. It is also referred to as the verification and validation model. It depicts the relationship of quality assurance actions to the actions associated with communication modelling and early construction activities. In the V-model as the team moves down the left side, requirements are refined into detailed solutions. Once coding is done they move up the right side, performing tests to validate each development phase, ensuring quality at every step.



When to use V-model?
- Clear and stable requirement
- Defined testing phases
- Low risk of changes
- strict quality assurance needs.

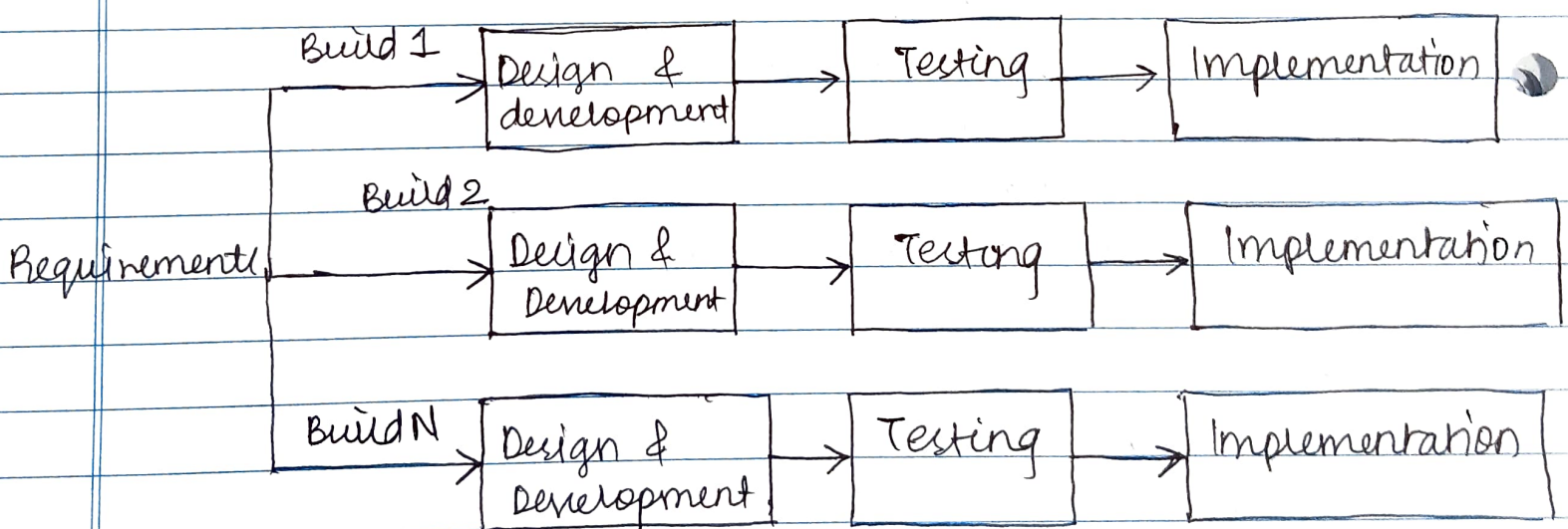
Advantages
- Easy to understand
- Saves alot of time
- Avoids downward flow of defects.

Disadvantages
- Rigid & least flexible

- Not good for complex projects
- No early prototypes of the software are produced.

(3) Incremental Process Model :-

- The incremental model combines elements of linear & parallel process flows. It applies linear sequence in a staggered fashion as calendar time progresses. When an incremental model is used, the first increment are often a core product i.e basic requirements are addressed but many supplementary features remain undelivered. The core product is used by the customer (or undergoes detailed evaluation). As a result, a plan is developed for the next increment. The plan addresses the modification of the core product to better meet the needs of the customer and the delivery of additional features and functionality. This process is repeated following the delivery of each increment, until the complete product is produ

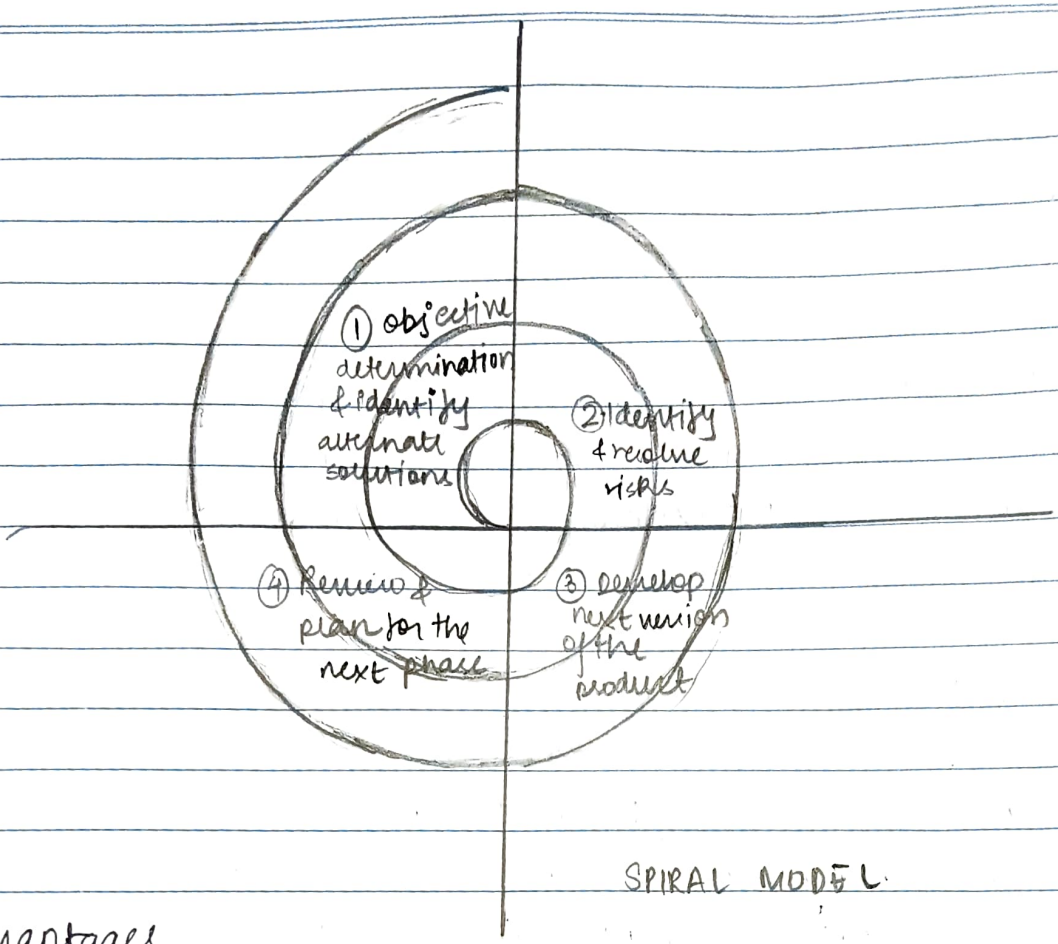


Advantages:-
- Errors are easy to be recognized.
- More Flexible
- Easier to test & debug.

Disadvantages
- Cost is high
- Need for good planning
- Well defined module interfaces are needed.

(4) SPIRAL MODEL

Originally proposed by Barry Boehm, the spiral model is an evolutionary software process model that couples the iterative nature of prototyping with controlled & systematic aspects of the waterfall model.
The spiral development model is a risk driven model generator that is used to guide multi-stakeholder concurrent engineering of software intensive systems. It has two main distinguishing features. One is cyclic approach for incrementally growing a system's degree of definition & implementation while decreasing its degree of risk. The other is a set of anchor point milestones for ensuring stakeholder commitment to feasible & mutually satisfactory system solutions.
A spiral model is divided into a set of framework activities defined by the software engineering team.



SPIRAL MODEL

Advantages
- Risk handling
- Good for large projects
- Customer satisfaction
- Improved quality

Disadvantages
- Complex
- Expensive
- Difficulty in time management
- Too much dependability on Risk Analysis

Spiral Model delivers high quality software by promoting risk identifications, iterative development & continuous client feedback. When a project is vast in software engineering, a spiral model is utilized.