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SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

ASSIGNMENT - 1

Waterfall Model:

The waterfall model, sometimes called the classic life cycle, suggests a systematic, sequential approach to software development that begins with customer application of requirement & progress through planning, modelling, construction & deployment, culminating in ongoing support of the completed software.

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

Communication

→ Planning

→ Modelling

→ Construction

→ Deployment

Advantages:

- Simple & easy to understand
- Easy to manage
- Best for smaller projects
- Individual processing

Disadvantages:

- Rigid
- Late testing
- Not suitable for evolving projects
- lengthy development cycle.

For example: In a library management system, phases include

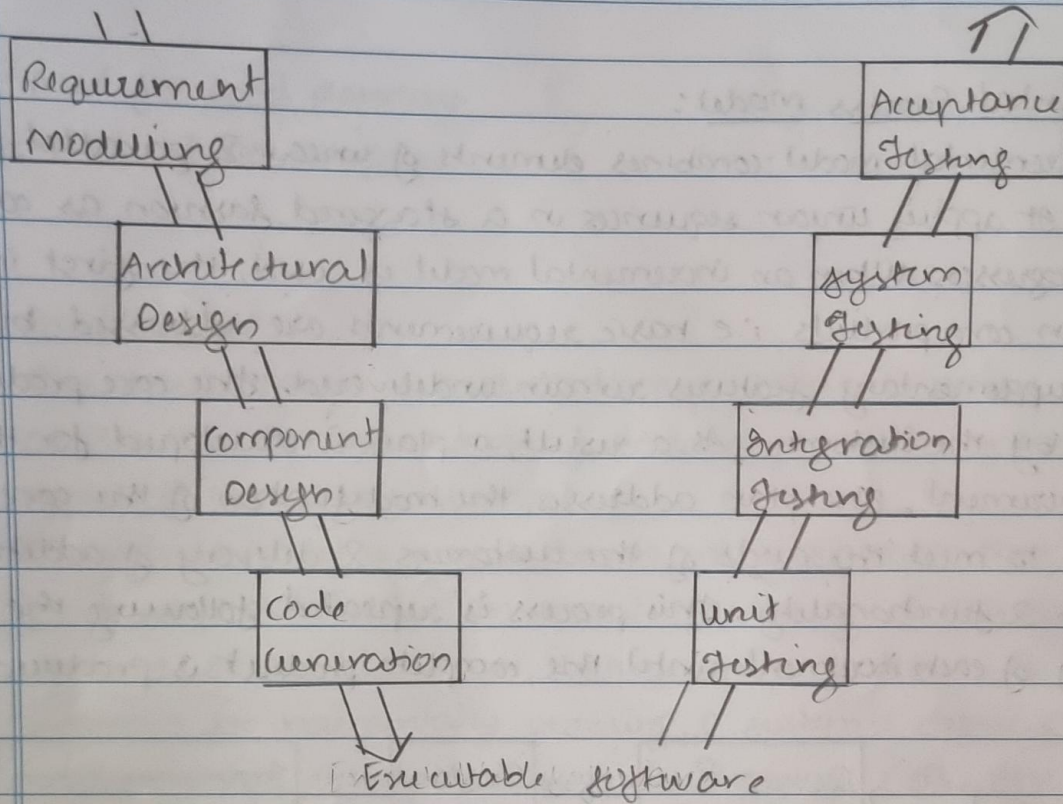
requirement analysis, system design, implementation testing, deployment & maintenance.

When to use waterfall model?

- Well understood requirements
- Very little changes expected
- Small to medium size projects
- Limited Resources

V Model:

A variation in the representation of the waterfall model is the V model. It is also referred to as the verification & validation model. It depicts the relationship of quality assurance actions to the actions associated with communication, modelling & 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 process ensuring quality at each step.



Where to use V Model?

- Clear & stable requirements
- Defined testing phases
- Low Risk of changes
- Strict quality assurance needs

Advantages:

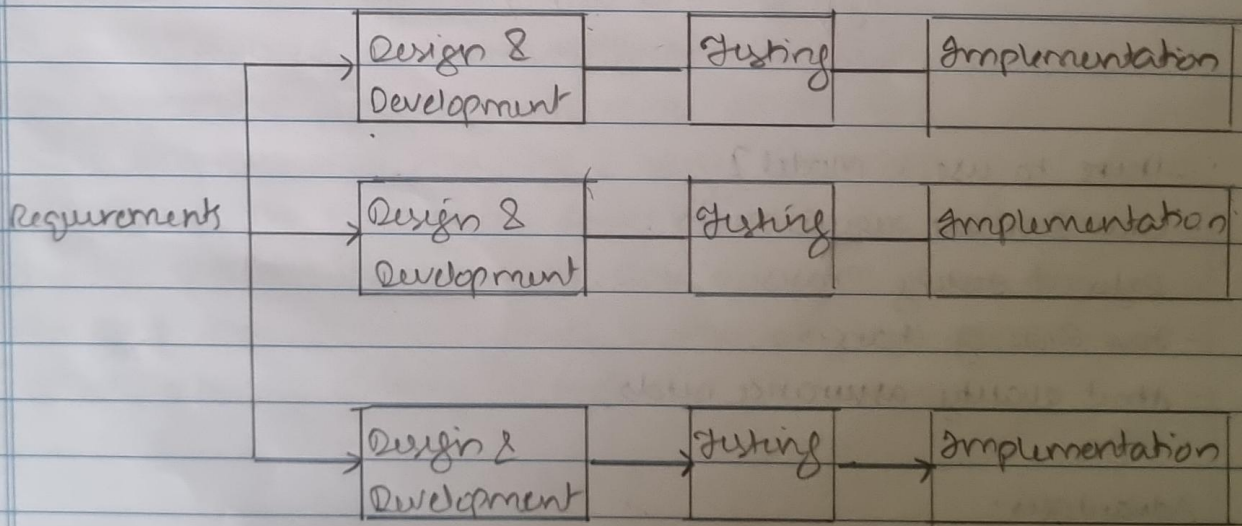
- Easy to understand
- Saves a lot of time
- Avoids downward flow of defects

Disadvantages:

- Rigid & least flexible
- Not good for complex projects
- No early prototypes

Incremental Process Model:

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



Advantages

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

Disadvantage:

- High cost

- Need for good planning
- Well defined interfaces

Spiral Model:

The spiral model is a ~~revolutionary~~ software process model that couples the iterative nature of prototyping with controlled & systematic aspects of the waterfall model.

The spiral 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 a cyclic approach for incrementally growing a system's degree of definition of 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.

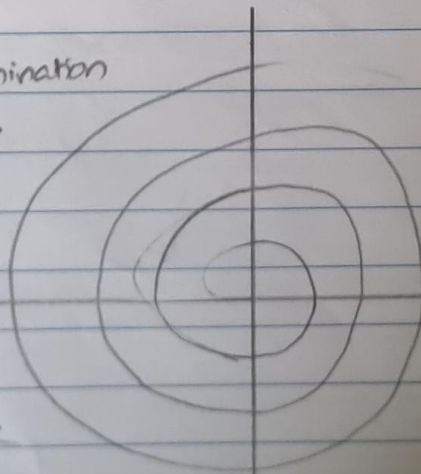
A spiral software is divided into a set of framework activities defined by the software engineering team.

1. Objectives of determination
& identify alternate
solutions

2. Identify & resolve risks

4. Review & plan
for the next phase

3. Develop next version of
the product



Advantages:

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

Disadvantages:

- Complex
- Expensive
- Difficulty in time management.