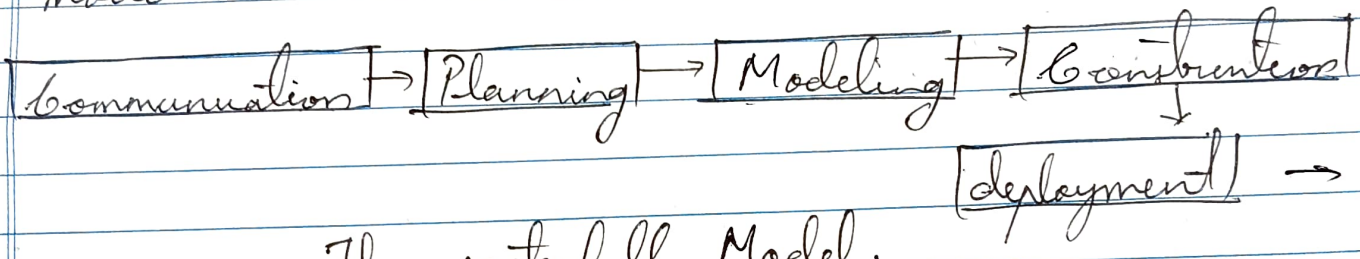
SEPM.

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 progresses through planning, modeling, construction & 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.

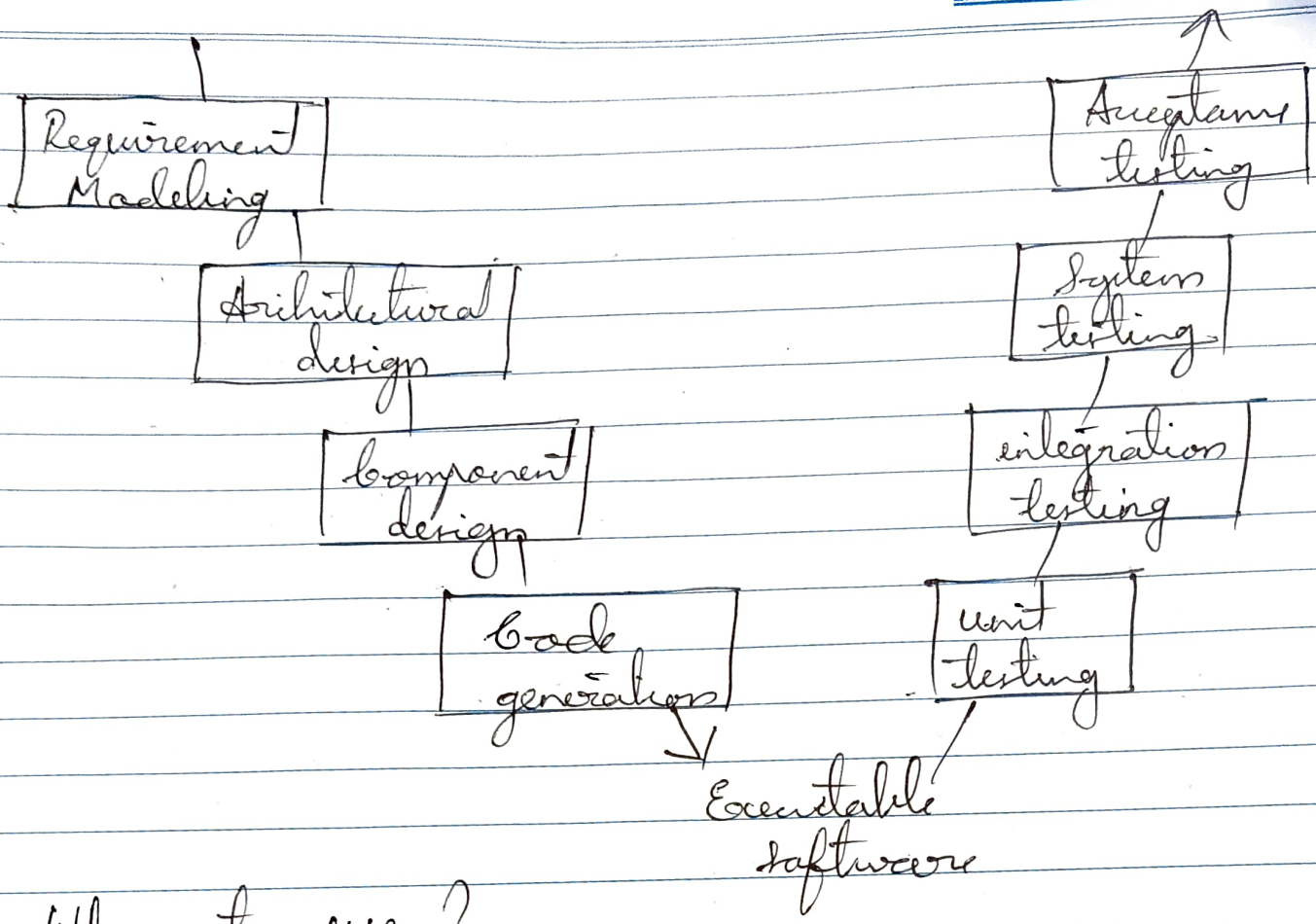
- **Advantages:**
  - Simple & easy to understand.
  - Easy to manage.
  - Best for smaller projects.
  - Individual processing

- **Disadvantages:**
  - Inflexible.
  - Late testing.
  - Not suitable for evolving projects
  - Lengthy development cycle.

For eg:
In a library management system, phases include requirement analysis, system design, implementation, testing, deployment & 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 & sequential approach.
- Limited resources.

V Model:
- A variation in the representation of the waterfa model is called the V-model. It is also referred to as the verification & validation mo It depicts the relationship of quality assuran action to the actions associated with communic modeling & early construction activities. In the V-model as the team moves down the left- requirements are refined into detailed solution Once coding is done, they move up the rig side, performing tests to validate each develop phase, ensuring quality at every step.



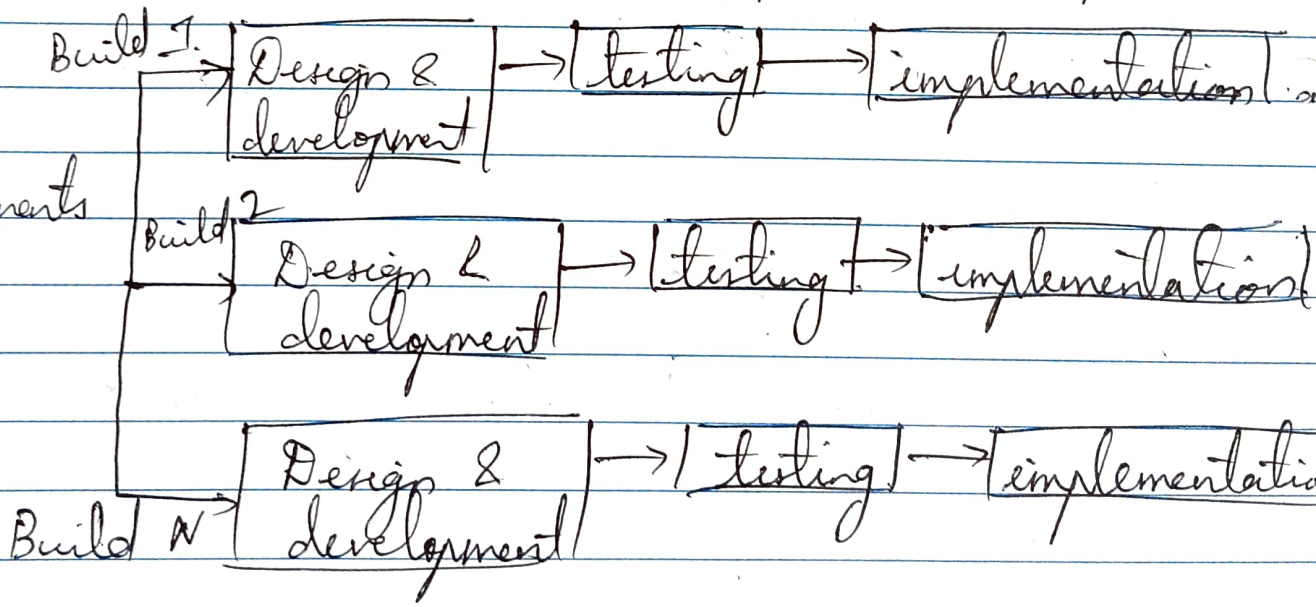
- When to use?
  - Clear & stable requirements.
  - Defined testing phases
  - Low risk of changes
  - Strict quality assurance needs.

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 of the software are pr

Incremental process model:

- It combines elements of linear & parallel process flows. It applies linear sequences in a staggered fashion as calender 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 & the delivery of additional features & functionality. This process is repeated following the delivery of each increment, until the complete product is produced.



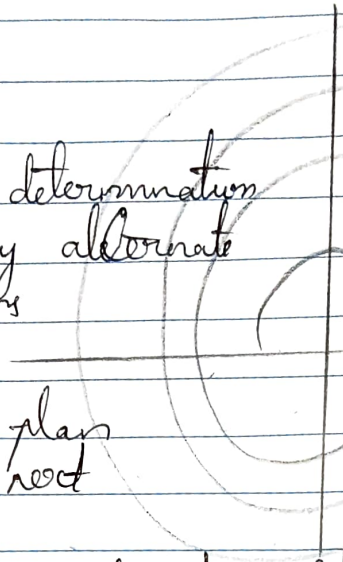
Incremental model.

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.

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 2 main distinguishing features. One is a 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 identification, iterative development & continuous client feedback. When a project is vast in software engineering, a spiral model is utilized.