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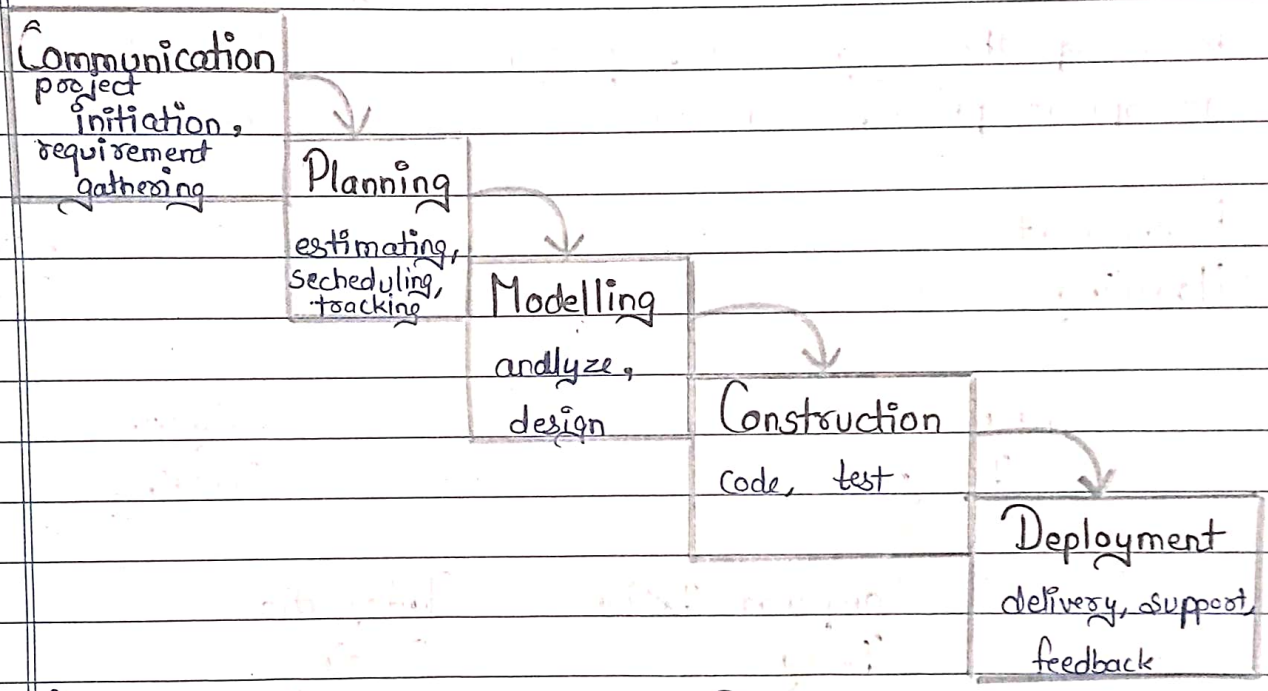
ASSIGNMENT - 1

WATERFALL MODEL:

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



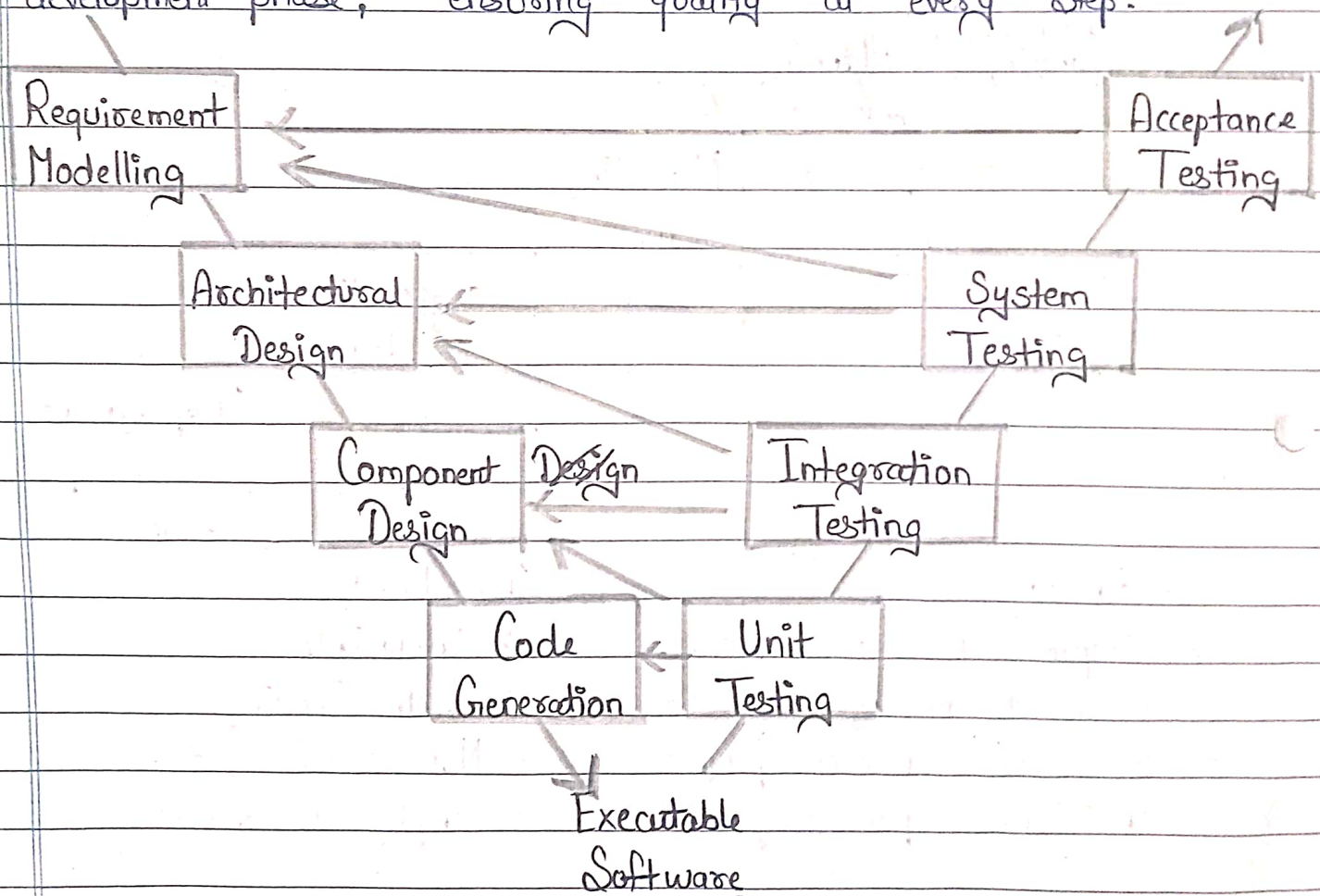
Advantages:
- → Simple & Easy to Understand
- → Easy to manage
- → Best for smaller projects
- → Individual processing

Disadvantages:
- → Inflexible
- → Late Testing
- → Not suitable for evolving projects
- → Lengthy development cycle.

→ The Waterfall Model should be used when the requirements are well understood, very little changes are expected, for small to medium sized projects, with limited resources.

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.



Advantages

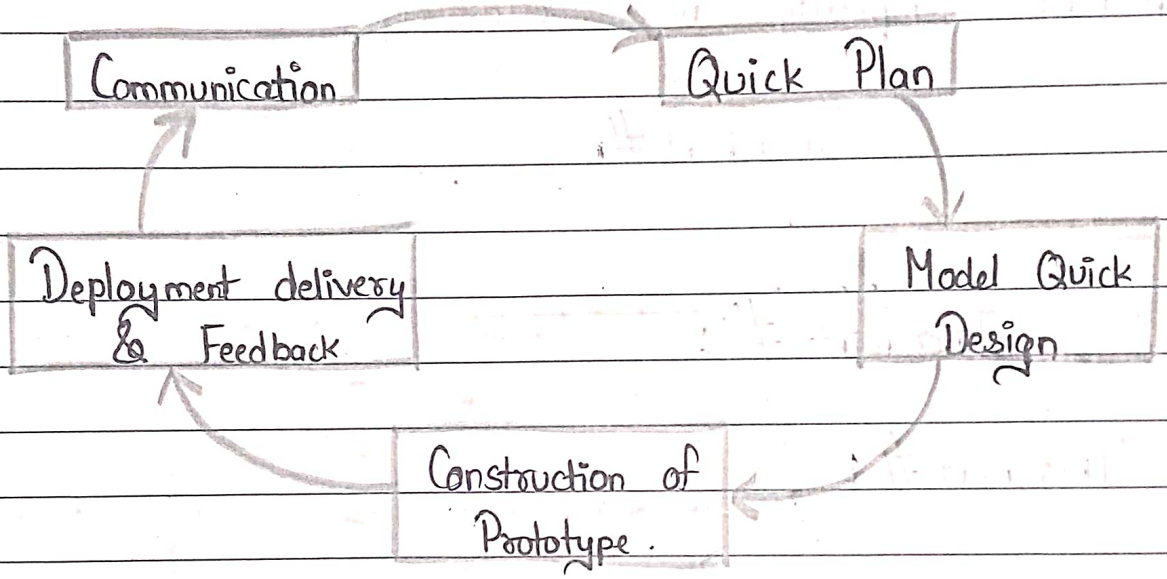
→ Easy to understand
→ Saves a lot of time
→ Avoids downward flow of defects

Disadvantages:

→ Rigid and least flexible
→ Not good for complex projects
→ No early prototypes of software are produced.

EVOLUTIONARY MODEL:

→ **Prototyping:** is a Software development approach where a prototype is built, tested, and then refined based on user feedback. This process continues iteratively until the prototype evolves into the final product. The goal is to clarify requirements and validate the system design through user interaction before the final implementation.



Advantages:

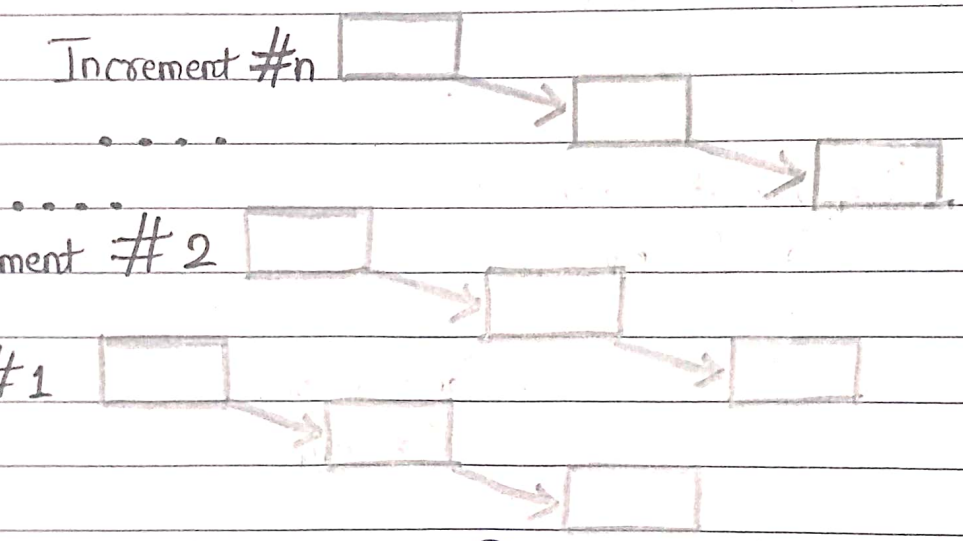
→ User Feedback
→ Faster Development
→ Flexible and Adaptable
→ Reduced Risk of Misunderstanding Requirements

Disadvantages:

→ Incomplete Requirements
→ User Confusion
→ Resource Intensive
→ Lack of Documentation

→ Prototyping is useful when the requirements are not well understood or expected to evolve over time, also if application depends on user interaction, feedback or preferences to ensure the design alignment.

→ Incremental Model: this approach divides the System into smaller, manageable parts with a portion of functionality, which is developed, designed and tested independently. The System is built and delivered in stages, with each stage adding more functionality, until the complete system is developed. This iterative process helps to minimize the risk of errors, deliver partial functionality to the client faster, and manage complexity more effectively.



Advantages:

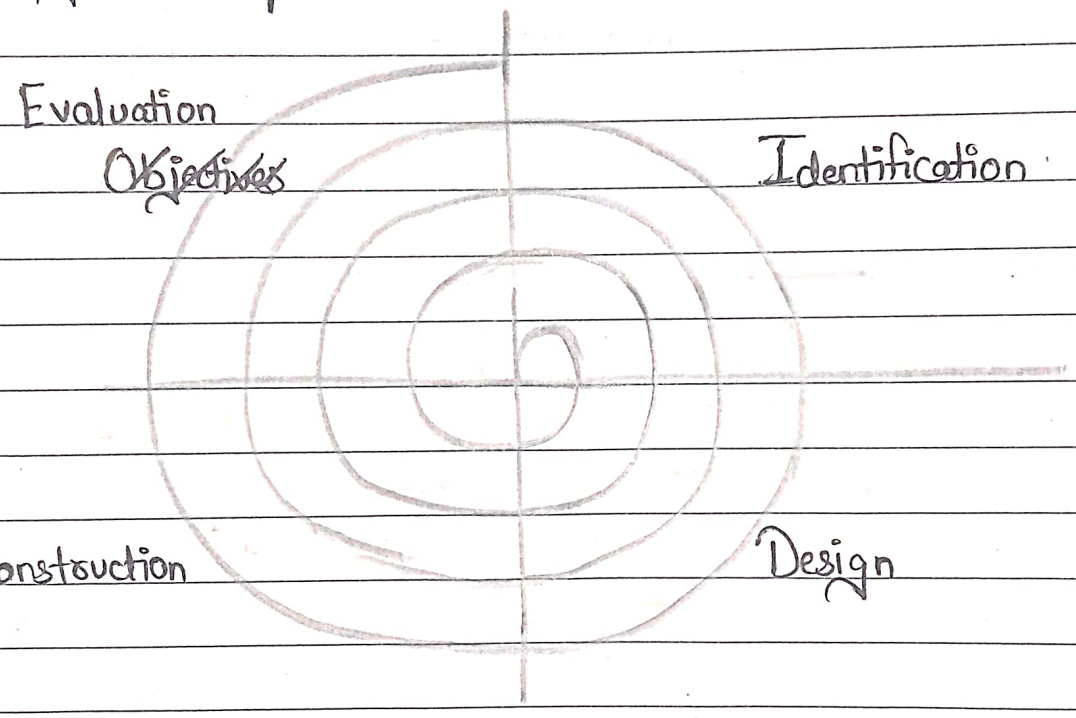
→ Faster Delivery
→ Flexibility and Adaptability
→ Reduced Risk
→ Customer Feedback
→ Easier Maintenance

Disadvantages:

→ Increased Complexity
→ Possible Rework
→ Managing Multiple Increments
→ Potential for Misunderstanding of System Design

→ Incremental Model is used when the requirements are well understood, but there may be changes over time. It is useful for large systems or when feedback is essential.

⇒ Spiral Model: is a model that combines elements of both iterative development and traditional waterfall models. It focuses on risk management, making it particularly suitable for large, complex, or high-risk projects. The model emphasizes a cyclical process where development proceeds through repeated iterations while continually refining the product based on feedback and risk analysis.



Advantages:
- → Risk Management
- → Flexibility
- → Customer Involvement
- → Improved Quality

Disadvantages:
- → High Complexity
- → Costly and Time Consuming
- → Requires Expertise
- → Difficult to Estimate

→ Spiral Model is mostly used in large projects, where requirements may evolve during development. It is also useful in projects with high risks and which require early deliverables for feedback and improvement.