SHUBHAM PANDEY
TE / T21
14/01/2025 ROLL NO:- 70

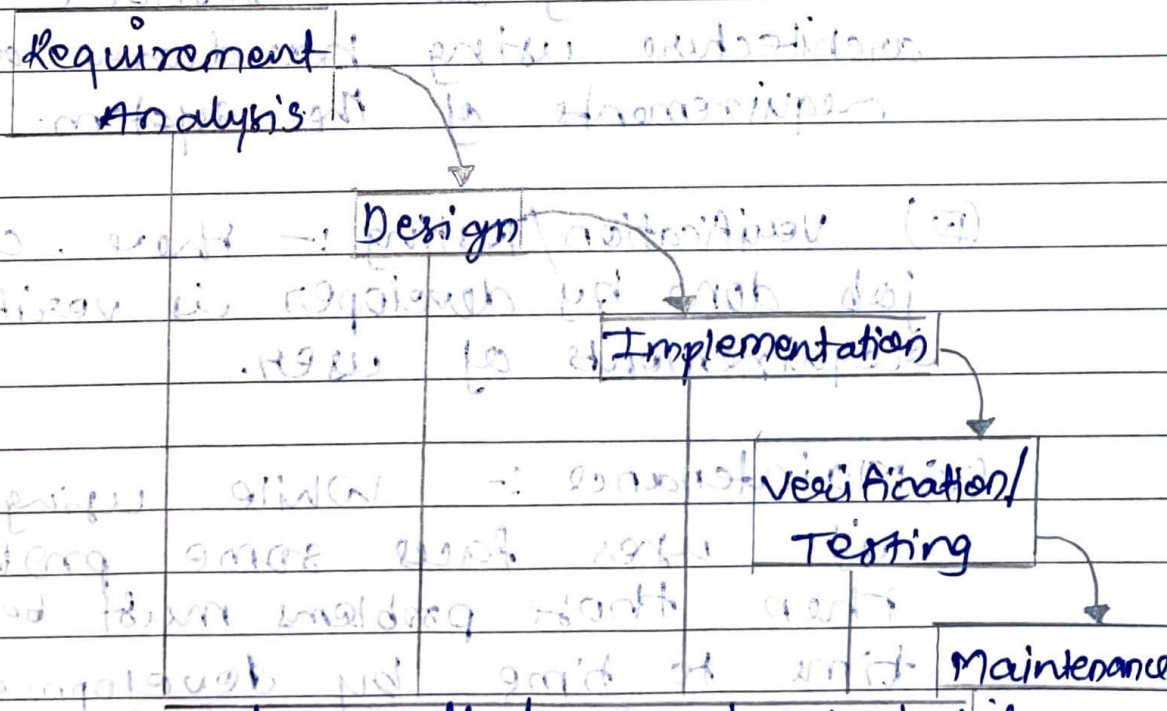
Assignment ~~Experiment~~ No 01

Q. Explain software Development Models.

Ans:- i) Applying technological, scientific and administrative approach to designing, developing testing and maintaining the software product in order to meet customer's requirement with best quality of product is refered as software engineering.

ii) The different development models are

1) Waterfall Model :- a) Waterfall Model is the first approach used in software development process.



b) It is also called as classical life cycle model or linear sequential model

c) In waterfall model any phase of development process begins only if previous phase is completed.

(I) Requirement Analysis :- In this phase, all business requirements of system are gathered and analysed by communication between stakeholders and managers.

(II) Design :- Based on requirement specification document, design of the systems is created called Software Architecture.

(III) Implementation :- In this phase, actual coding is constructed for software architecture using hardware and software requirements of the system.

(IV) Verification/Testing :- Here, coding or job done by developer is verified against requirements of user.

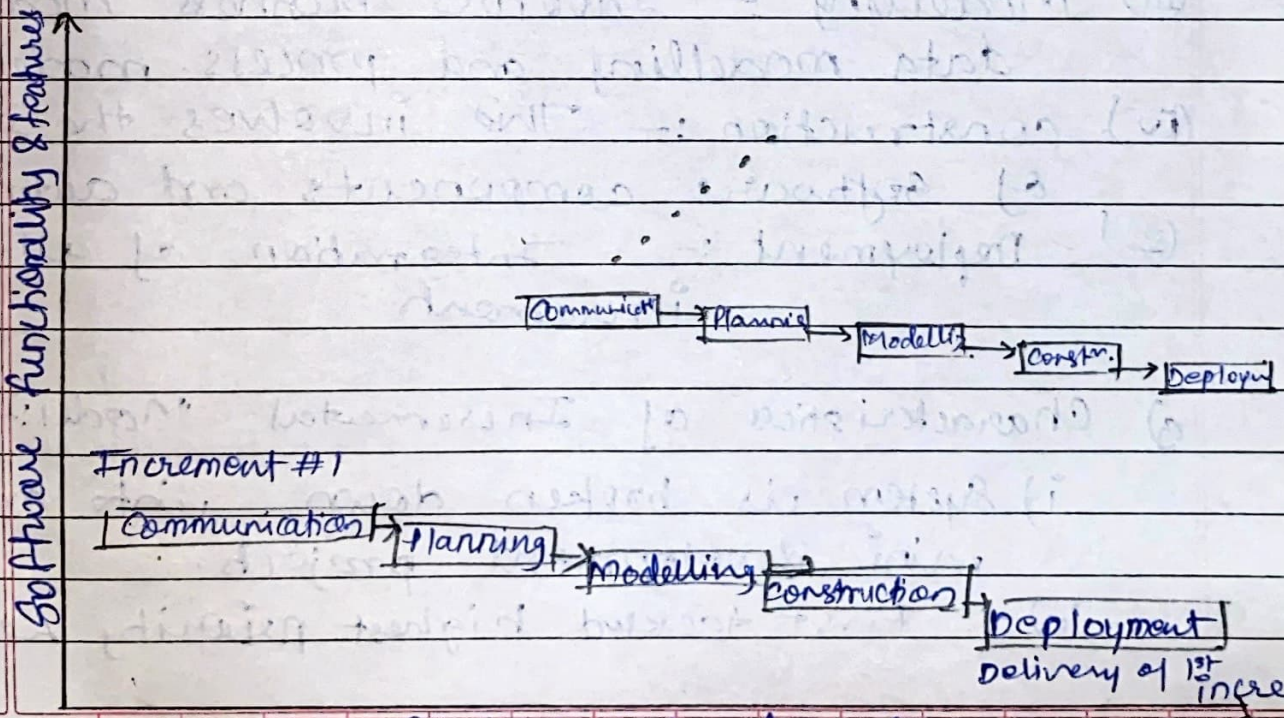
(V) Maintenance :- While using software if user faces some problem, then those problems must be solved time to time by development team.

d) Advantages of waterfall model :-
i) It is very simple to understand and easy to use.
ii) Phases do not overlap with each other.
iii) It is easy to manage development process.

e) Disadvantages of waterfall model :-
i) It is not useful for large projects.
ii) It is very difficult to modify system in middle of development process.

f) This model is used only when requirements are very well known, clear and fixed.

2) Incremental Model :- a) The incremental model applies the waterfall model incrementally



b) The series of releases is referred to as 'increments' with each increment providing more functionality.

c) After the 1st increment, a core product is delivered which can already be used by customers.

d) Based on customer feedback, a plan is developed for the next increments.

e) This process continues with increments being delivered until the complete product is delivered.

f) The incremental model is also used in Agile process model.

(I) Communication :- Helps to understand the objective.

(II) Planning :- Required as many people work on the same project.

(III) Modelling :- Involves business modelling data modelling and process modelling.

(IV) Construction :- This involves the reuse of software components and automatic code

(V) Deployment :- Integration of all the increments.

g) Characteristics of Incremental Model:-

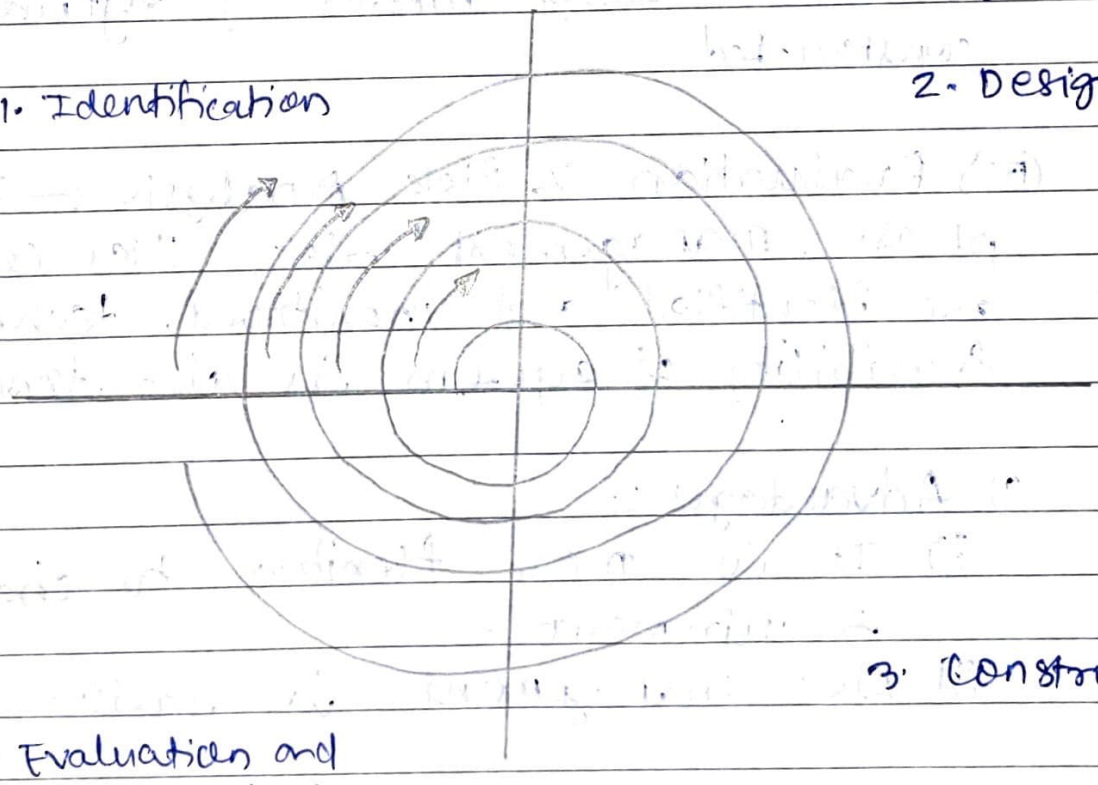
i) System is broken down into many mini development projects.

ii) First tackled highest priority requirement

b) Advantages:-
i) Generally easier to test and debug because relatively smaller changes are made during each iteration.
ii) Initial product delivery is faster and costs less.

i) Disadvantages :- i) Resulting cost may exceed the cost of organization.
ii) Problems may arise related to system architecture which were not evident to earlier prototypes.

3) Spiral model :- a) Spiral Model is a combination of iterative model and waterfall model.



b) Spiral model has four phases of development, each of these phases is called as spiral.

(I) Identification :- This phase identifies all business requirements of the system at the beginning. It involves clear understanding of requirements by communication between stakeholders and customer.

(II) Design :- Design phase develops conceptual design of system based on initially gathered requirements.

(III) Construct :- This phase develops a code for conceptual design to get user feedback. In next subsequent spirals, detailed working model of software is constructed.

(IV) Evaluation & Risk Analysis :- In this phase, management risks like cost overrun are identified and monitored, technical feasibility of system is also done.

c) Advantages :-

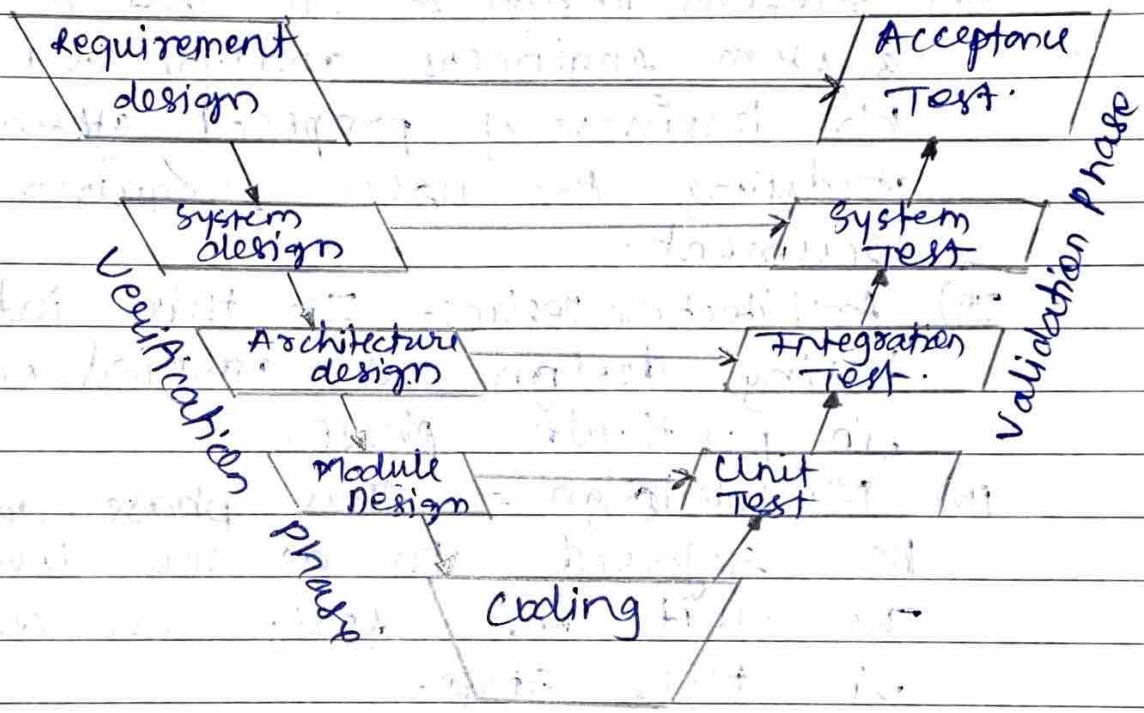
i) It is more flexible to change requirement.

ii) Risk management is easier.

d) Disadvantages :-

i) Difficult to manage development proces
ii) Spiral can run indefinitely.
iii) Not useful for small projects development

4) V-Model :- a) The V-model represents a development process that may be considered an extension of waterfall model.



b) Instead of moving down in linear way, the process steps are bent upwards after the coding phase to form typical V-shape.

c) The horizontal & vertical axes represent time or project completeness and level of abstraction respectively.

d) This Model is basically divided into two phases :-

A) Verification Phases :-

I) Requirement Analysis :- In this phase the requirements of the system are collected by analysis the needs of the user.

II) System Design :- In this phase, system engineers analyze and understand the business of proposed system by studying the user requirements document.

III) Architecture Design :- In this integration testing design is carried out in particular phase.

IV) Module Design :- This phase can also be referred to as low-level design. The unit test design is developed in this stage.

B) Validation Phases :-

I) Unit Testing :- This verifies all the smallest entity can function correctly when isolate from rest of the codes/units.

(II) Integration Testing :- Verify that units created & tested independently can coexist & communicate among themselves.

(III) System Testing :- composed by client's business team. It also ensures that expectations from application developed are met.

(IV) User Acceptance Testing :- Verifies that delivered system meets user's requirement and system is ready for use in real time.

e) Advantages :-
i) Simple and easy to use.
ii) Avoids the downward flow of defects
iii) Proactive defect tracking.

f) Disadvantages :-
i) Very rigid and least flexible model.
ii) No early prototypes are produced.
iii) If changes in midway, then there is need to update the test documents along with requirement documents.

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