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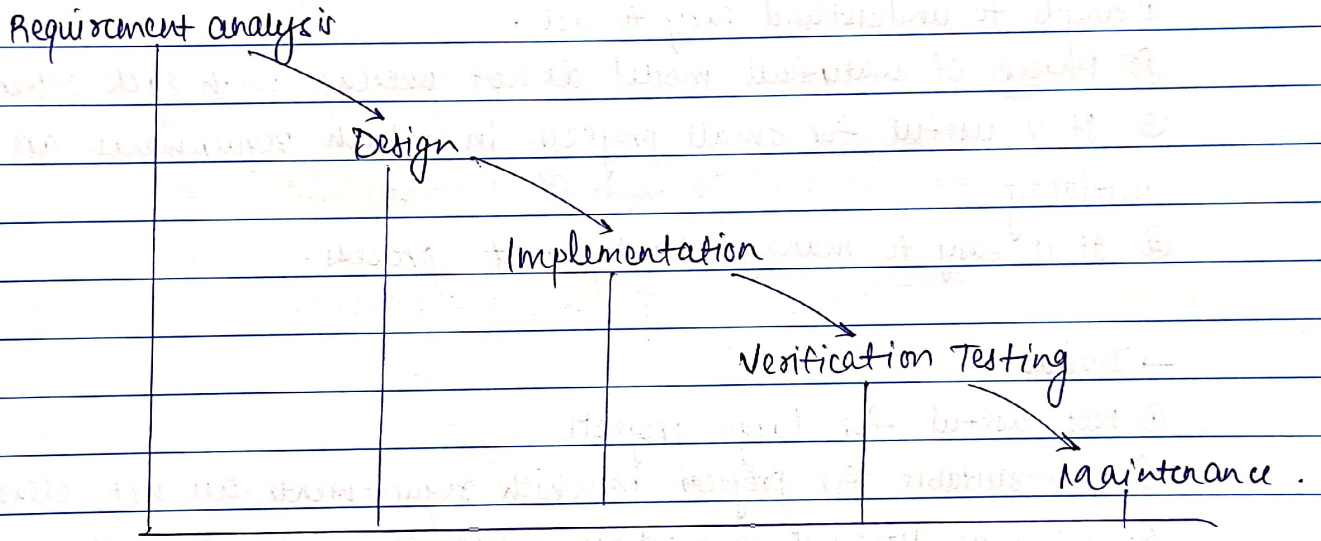
TA1, 80

SEPM ASSIGNMENT - 1.

Q. Explain software development models.

→ i) Applying technological, scientific and administrative approach to designing, developing and testing, and maintaining the software product in order to meet customer's requirements.

1) Waterfall model: first approach used in software dev process.



→ Also called as classical life cycle model or linear sequential model.

→ In waterfall model any phase of dev process begins only if previous phase is completed.

~~to~~

⇒ Requirement Analysis: in this phase, all business requirements of systems are gathered and analyzed by communication betn stakeholders and managers.

→ Design: based on requirement specification doc, design of the systems is created. It is the blue print of system representing system's internal structure.

⇒ Implementation: actual coding is ~~stru~~ constructed. It is the responsibility of the developer.

⇒ Verification / Testing: here coding or job done by dev is verified against requirements of user. Software is deployed after successful verification.

⇒ Maintenance: while using software if user faces some problems then these problems must be solved from time to time.

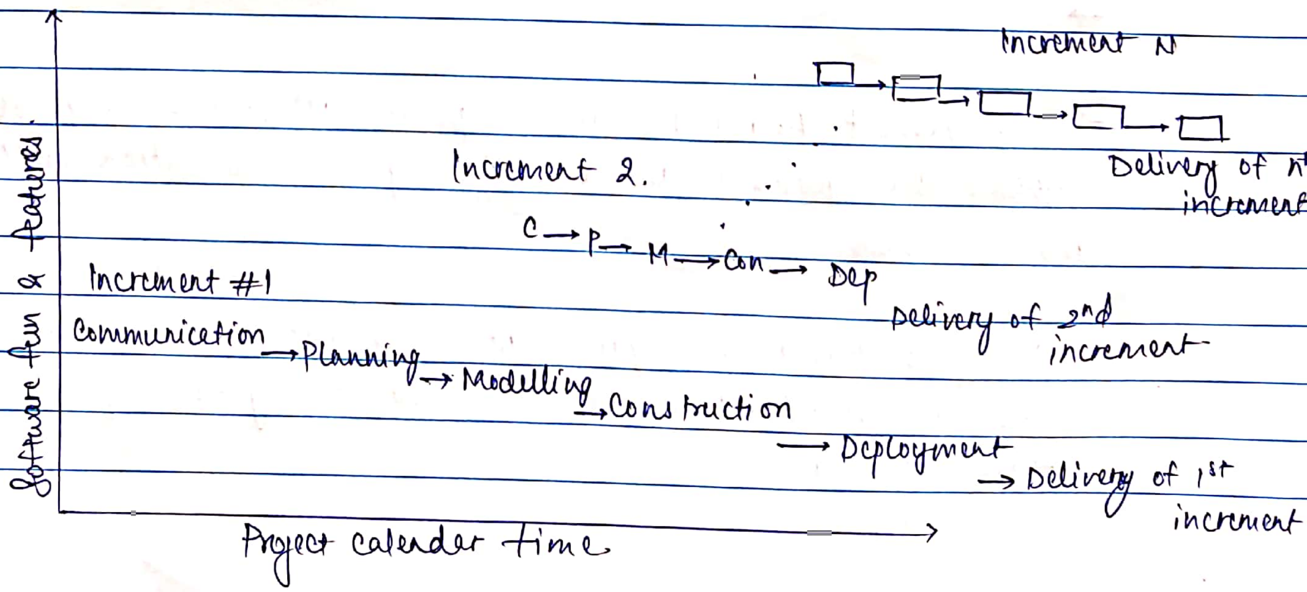
→ Adv:

① Simple to understand easy to use.
② Phases of waterfall model do not overlap with each other
③ It is useful for small projects in which requirements are clear initially.
④ It is easy to manage development process.

→ Disadv:

① Not useful for large projects.
② Not suitable for projects in which requirements are not clear initially
③ It is very difficult to modify system requirements in the middle of dev process.

(2) Incremental model: applies the waterfall model incrementally.


Increment N
Delivery of nth increment
Increment 2.
C → P → M → Con → Dep
Delivery of 2nd increment
Increment #1
Communication → Planning → Modelling → Construction → Deployment → Delivery of 1st increment
Software fun & features
Project calendar time

→ Series of releases is referred to as increments; each increment adds more fun.

→ After first increment core product is delivered which can already be used by customer.

→ This process continues with increments being delivered until complete product is delivered.

→ Communication: helps to understand the objective.

→ Planning: required as many people work on the same project but diff fun at the same time.

→ Modelling: involves business modelling, data modelling & process modelling.

→ Construction: this involves the reuse of software components and automatic code

→ Deployment: integration of all the increments.

→ Adv:

① Generally easier to test and debug because relatively smaller changes are made during each iteration.

② Initial product delivery is faster & costs less.

→ Disadv:

① Resulting cost may exceed the cost of org.

② Problems may arise in system architecture which were not evident in earlier prototypes.

→ (3) Spiral model: is a combination of iterative & waterfall model.

→ Spiral model has 4 phases of dev, each of which is called a spiral.

→ Identification: this phase identifies all business requirements of system based ~~on~~ i at the beginning.

⇒ Design: develops conceptual design of system based on initially gathered requirements..

⇒ Construct: this step develops a code for conceptual design to get user feedback. In next subsequent spirals, detailed working model of software is constructed with increment number and delivered to customer feedback.

⇒ Evaluation & Risk analysis: in this phase, management risks like cost over run are identified and monitored, technical feasibility of system is also done.

→ Advantages:

① More flexible to changing requirements.

② User can see the system from 1st iteration to end of dev.

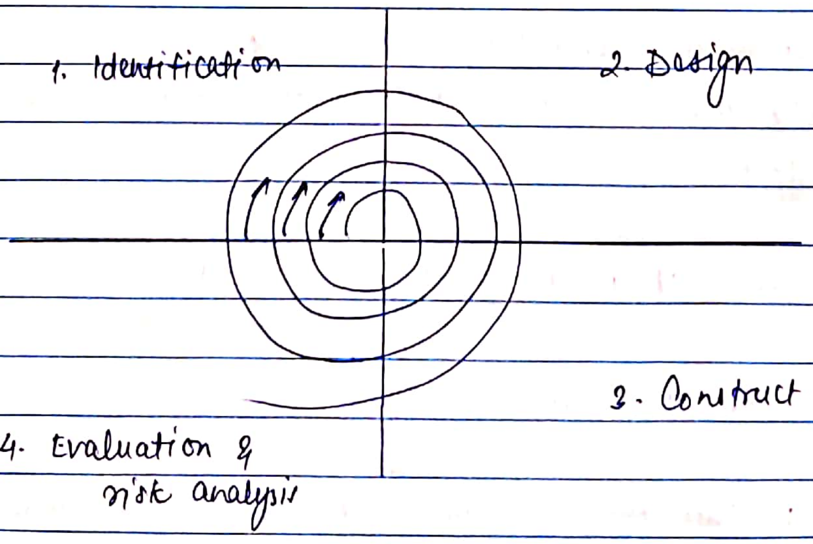
③ Risk management is easier.

→ Disadv:

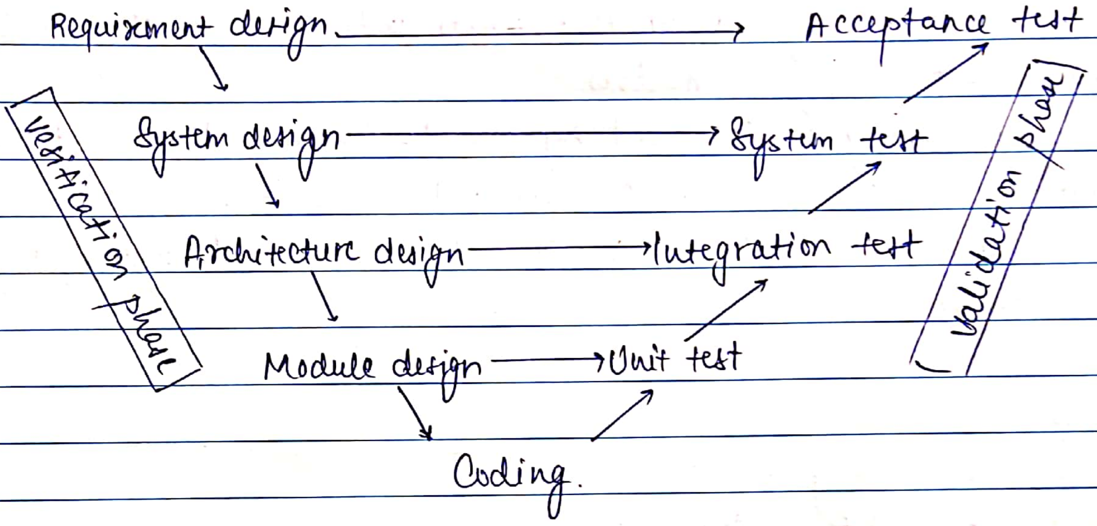
① Difficult to manage dev process

② Not useful for small projects dev.

③ Spiral can run indefinitely.



→ (4) V-model : represents a development process that may be considerd an extension of waterfall model.



→ Instead of moving down in a linear way , the process steps are bent upwards after coding stage to form a V-shape.

→ The horizontal and vertical axes represent time or project completeness and level of abstraction respectively.

→ This model is basically divided into two phases.

→ verification phase:

⇒ Requirement analysis : requirements of the system are collected by analyzing user needs.

⇒ System design : in this phase a blueprint is designed based on user requirements.

⇒ Architecture design : integration testing design is carried out

⇒ Module design : this phase can also be referred to as low-level design. The unit test design is dev at this stage.

→ Validation phase:

1) Unit testing: verifies all the smallest entities can function correctly on isolation.

2) Integration testing: verify that ~~units~~ individual units can communicate and coexist among themselves.

3) System testing: Composed by client's business team. It also ensures that expectations from app^{n} developed are met.

4) User acceptance testing: verifies that delivered system meets user expectation.

→ Adv:

① Simple & easy to use
② proactive defect tracking
③ Avoids downward flow of defects
④ Good for small projects in which requirements are easily understood.

→ Disadv:

① very rigid and least flexible model.
② No early prototypes are produced.
① If changes midway, the there is a need to update test docs along with requirements documents.