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SE Assignment.

Q1]

→ As the technology changes, the user requirements and environment on which software is working also changes. So every organization is ranked based on the software engineering principles used by that organization Implementing and managing large size of software programmes requires a specific method modularize the tasks so that size of software cant harm the software quality.

Software engineering provide methodology for implementing complex software system with high quality.

without any standard method or management, it is difficult to address defects in the product and correct them as early as possible software engineering provides this functionality. Extending the precious software to add new functionality require more cost in terms of time to develop and efforts taken by people, as compare to the process of developing new software to provide that functionality.

.Software engineering provides a way in which software system can be able to scale as needed in future.

Q2]

Waterfall model - Sequential and linear approach.

* Each phase must be completed deto·before morning to the next one.

* clear and structured, suitable for project with well defined requirements, minimal changes and stable scope.

* Limited flexibility for changes, difficult to adapt to evolving requirements, potential for late stage error discoveries.

* V model (validation and verification model)

Parallel development and testing approach. Each development phase is folled by a corresponding testing phase

Strong emphasis on validation and verification, clear documentation, & reduces risk by identifying issue easily.

* incremental model - similar to iterative models, but the software is built in increments, each delivering specific functionality.

Early delivery of function modules, reduced time to market allows for better integration testing.

Require careful planning to define increments, possible integration challenges.

* Iterative model similar to agile, but with more structured and defined phases. Each iteration may include a subset of software functionality

Requires clear planning and co-ordination between iterations, potential for scope creep.

Q3]

The cmm models application in software development has sometimes been problematic. Applying multiple models that are not integrated within and across an organization could be costly in training appraisals and improvement activities

- The capability maturity model integration (cmmI) project was formed to sort out the problem of using multiple models for software developement process. thus cmmI model has superseded the cmm model, though the cmm model continues to be general theorctical process capability model used in public domain

- cmmI framework consist of a collection of computer program based on knowledge, engineering software engineering, integrated product and process development

cmmI framework has three group as

1] cmmI for development (cmmI - Dev)

2] cmmI for service (cmmI - svc)

3] cmmI for aquisation (cmmI - ACQ)

4)

Prescriptive process model.	Evolutionary process model
• Developed to bring order and structure to the software developement process	• stages consist of growing increments of an operational software product with evolution
• It can accomodate changing requirements	• Improvement is required in the product
• It is more popular	• It is less popular
• waterfall model and incremental model are few example	• Spiral & prototyping model as well as RAD model

5] Incremental model - when a project can be divided into smaller functional increments. allowing certain modules to be developed and delivered independently while enduring integration and testing along the way

• RAD model - When there is a need to quickly produce a working prototype to gather user feedback and make refinment before proceeding with full levelopement.

waterfall model - when requirements are stable and changes are minimal, making it possible to plan nd execute the project in lineal sequence of phase.

Agile model (scrum) - when flexibility and adaptibility re crucial and the project can be divided into smaller increments with frequent iterations, allowing or continuous feedback and changes.

06]

Waterfall model is the first approach in Software developement process. It is also called as classical life cycle model or linear sequential model. In waterfall model any phase of developement process begins only if previous phase is completed

· Agile software developement describe an approach to software developement unclear which requirement and solution revolve through the collaborate effort of self organizing and cross functional teams and their customer

· It advocates adaptive planning evolutionary developement early delivery and continual improvement and it encourages rapid and flexible response to change

The term agile was popularized in this context by manifesto for agile software development.

waterfall

Development speed

waterfall is linear and sequential methodology where each phase must be completed before moving to next. This can lead to longer development cycles.

metrics : Time taken for each phase (requirements, design, development, testing, development)

Adaptability to change

Waterfall is less adaptable to changes in requirement due to rigid structures.

metric: Number to change request, impact analysis, time and delay caused by change request.

Customer satisfaction

- Waterfall may have limited customer involvement until the end, which could affect satisfaction.
- metric - Customer feed back at end of project post - deployement support requirements.

2] Agile (Scrum & kanban)

Development speed:

- Agile methodologies emphasizes incremental developmenta allowing for quicker delivery of working features.
- metrics: Number of changes inco-porated per sprint / cycle, time taken to respond to change request.

Customer satisfaction:

Agile memodologies involve continuous customer feedback and collaboration, leading to improved satisfaction

metrics: Regular customer feedback scores. frequency of customer involvement.

Q8

Features	Waterfall model	Incremental model	Prototyping model	Spiral model
Requirement Specification	well under-stood	not well understood	not well understood	well understood
Understanding requirements	well understood	not well understood	not well understood	well understood
Availability of reusable component	No	Yes	Yes	Yes
Risk analysis	only at start	no risk analysis	no risk analysis	Yes
user involvement	only at start	intermediate	high	high
Implementation time	long	less	less	depends on project
flexibility	rigid	less	high	flexible
expertise required	high	high	medium	high
cost control	yes	no	no	yes
resource control	yes	yes.	no	yes