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SE - Assignment - I

Q1)

As the technology changes, the user requirement 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 can't harm the software quality

Software engineering provides methodology for implementing complex software systems with high quality

Without any standard method or management, it is difficult to address defects in the product and correct as early as possible. Software engineering provides this functionality

Extending the previous software to add new functionality requires 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 before moving to the next one.
Clear and structured, suitable for projects with well-defined requirements, minimal changes and stable scope.
Limited flexibility for changes, difficult to adapt to evolving requirements, potential for late-stage issues discovery.

→ V-model (Validation and Verification model): Parallel development and testing approach. Each development phase is followed by a corresponding testing phase.
Strong emphasis on validation and verification, clear documentation reduces risk by identifying issues early.
Limited adaptability to changing requirements, potential for miscommunication, reduces risk by identifying issues early.

→ Incremental model - Similar to iterative models, but the software is built in increments, each delivering specific functionality.
Early delivery of functional modules, reduced time to market, allows for better integration testing.
Requires careful planning to define increments, possible integration

→ Iterative Model: Similar to agile, but with more structured & defined phases. Each iteration may include a subset of software.
Allows for iterations, refined features, and early feedback.
Suitable for projects with evolving requirements.
Requires clear planning and coordination 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 & improvement activities The capability maturity model Integration (CMMI) project was formed to sort out the problem of using multiple models for software development processes, thus the CMMI model has superseded the CMM model. Though the CMM continues to be a general theoretical process capability model used in the public domain CMMI framework has three groups:

1. CMMI for development (CMMI-DEV)
2. CMMI for service (CMMI-SVC)
3. CMMI for aquisation (CMMI-ACQ)

Q4. Prespective Process Model

→ 1) Developed to bring order and structure to the software development process

2) It can accomodate changing requirements.

3) It is more popular.

4) Waterfall model and incremental model are a few examples of prespective process model.

Evolutionary Process Model

1) Stages consists of grouping increments of an operational software product with evolution

2) Improvement is required in the product

3) It is less popular

4) Spiral and prototyping model as well as RAD model.

85)

→ Incremental model : When a project can be divided into smaller functional increments allowing certain modules to be developed and delivered independently, while ensuring integration

RAD model : When there is a need to quickly produce a working prototype to gather user feedback and make refinements before proceeding with full development

Waterfall model : When requirements are stable and changes are minimal making it possible to plan and execute the project in a linear sequence of phases

Agile model : (Scrum) : When flexibility and adaptibility are crucial and the project can be devided into smaller Increments with frequent iterations, allowing for continuous feedback and changes.

86.)

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

- Agile software development describes an approach to software development under which requirements and solutions evolve through the collaborative effort of self organizing
- It advocates adaptive planning evolutionary development early delivery and continual improvement and it encourages rapid and flexible response to change
- The term agile was popularized in this context by the manifesto for agile software development.

8-] 1) Waterfall:

Development speed:

- Waterfall is a linear & sequential methodology where each phase must be completed before moving on the next. This can lead to longer development cycles.
- Metrics: Time taken for each phase (requirements, design, development, testing, deployment)

Adaptibility to change:

- Waterfall is less adaptable to changes in requirements due to its rigid structure
- metrics: number of change requests, impact analysis time & delay caused by change requests

Customer Satisfaction:

- Waterfall may have limited customer involvement until the end, which could affect satisfaction
- Metrics: customer feedback at the end of the project post-deployment support requirements.

2) Agile (Scrum & Kanban)

Development speed:

- Agile methodology emphasis incremental development allowing for quicker delivery of working features.
- metrics: No. of user stories completed per sprint or cycle, time, velo

Adaptibility to change:

- Agile methodologies are highly adaptible to changing requirements due to regular iterations & flexibility
- metrics: No. of changes incorporated per sprint/cycle, time taken to respond to change requests.

Customer satisfaction:

- Agile involves continuous customer feedback and collaborations
- Metrics: Regular customer feedback scores, frequency of customer

Teacher's Signature:.....

Q8.]

features	Waterfall model	Incremental model	Prototyping model	Spiral model
Requirement specification	well understood	not well understood	not well understood	well understood
Understanding Requirements	well understood	not well understood	not well understood	well understood
Availability of reusable components	No	Yes	Yes	Yes
Risk analysis	only at beginning	no risk analysis	no risk analysis	yes
User Involvement	only at beginning	intermidiate	high	high
Implementation time	long	less	less	depends on project
Flexibility	rigid	less	high	flexible
Expertise Required	high	high	medium	high
Cost control measure	yes	no	no	yes
control	yes	yes	no	yes.