SE Assignment 1

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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 programmer 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 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 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.

Q2.

* Waterfall model - Sequential and linear approach. Each phase must be completed before moving to next one.
- Clear and structured, suitable for projects with well defined requirements, minimal changes & suitable scope.
- Limited flexibility for changes, difficult to adapt to evolving requirement.

* 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 late-stage errors discovery.

* 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 challenges.

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 development processes, thus the CMMI model has suspended the CMM model, though the CMM model continues to be a general theoritical process capability model used in public domains.

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Qu. Respective process model	Evolutionary process model
• Developed to bring order and structure to the software development process.	Stages consists of grouping increments of an operational software product with evolut
• It can accomodate changing requirement	Improvement is required in the product
• It is more popular	It is less popular.
• Waterfall model and incremental models are a few examples of perspective process model	Spiral and prototyping model as well as RAD model.

Qs. Incremental model - When a project can be divided into smaller functional increments, allowing certain modules to be developed and delivered independantly while ensuring integration & testing along the way.

- RAD model - When there is a need to quickly produce a working prototype to gather user feedback and make requirements 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 - when flexibility and adaptability are crucial and the project can be divided into smaller increments with frequent iterations, allowing for continuous feedback & changes.

Q6. · Waterfall model is the first approach used in software development process
· It is also called as classical life cycle model or linear sequential model.
· In water fall model any phase of development process begins only if previous phase is completed.

· Agile software dev describes an approach to software dev under which requirements and ~~software~~ solution evolve through the collaborative effort of self-organizing and cross functional teams and their customer.
· It advocates adaptive planning, evolutionary development, early delivery and continual improvement, and it encourages rapid and flexible responses to change.
· The term agile was popularized, in this context, by the Manifesto for agile software dev.

Q7. (· Waterfall
- Development speed:
· Waterfall is a linear and 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).

- Adaptability to change
· Waterfall is less adaptable to changes in requirements due to its rigid structure.
· Metrics: Number of change requests, impact analysis time and delays caused by change request.

- 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 requirement.

2) Agile:
- Development speed:
- Agile methodologies emphasizes incremental development, allowing for quicker delivery of working features.
- Metrics: Number of user stories completed per sprint or cycle time

- Adaptability to change:
- Agile methodologies are highly adaptable to changing requirements due to regular iterations and flexibility.
- Metrics: Number of changes incorporated per sprint / cycle, time taken to respond to change requests.

- Customer satisfactions:
- Agile methodologies 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 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 the beginning	No risk analysis	No risk analysis	Yes
User involvement	Only at the beginning	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.