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S E Assignment 1

1. what is the significance of recognising software requirements in the software engineering process

sol^n :- i) As the technology changes, the user requirements and environment on which software is working also changes. So every organization is ranked based on software engineering principles.

ii) Implementing and managing large size of software programmer requires a specific method modularize the tasks so that size of software can't harm quality.

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

iv) 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.

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

2. Describe the main characteristics of different process models used in software development.

sol⁻: i) 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.

ii) V-model: Parallel development and testing approach. Each development phase is followed by a corresponding testing phase.

iii) Incremental model: Similar to iterative models but the software is built in increments, each delivering specific functionality. Requires careful planning to define increments, possible integration challenges.

iv) Iterative model: Similar to agile, but with more structured and defined phases. Each iteration may include a subset of the software functionality. Requires clear planning and coordination between iterations, potential for scope creep.

3. How does the CMM contribute to improving software development process?

soln:- i) The CMM models application in software development has sometimes been problematic. Appling multiple models that are not integrated within and across an organization could be costly in training and improvement activities.

ii) CMMI framework consists of collection of computer programs based on knowledge, engineering, software engineering, integrated product and process development and provider sourcing.

iii) CMMI framework has three groups as:
i) CMMI for development.
ii) CMMI for service.
iii) CMMI for acquisation.

4. Explain the differences between prescriptive process models and evolutionary process models?

Solⁿ.

Prescriptive process model	Evolutionary process model.
i) Developed to bring order and structure to the software development process	i) Stages consists of growing increments of an operational softwar product with evolution.
ii) It can accommodate changing requirements	ii) Improvement is required in the product.
iii) It is more popular.	iii) It is less popular
iV) Examples: waterfall models and incremental models.	iV) Examples: Spiral and proto- typing models as well as RAD model.

5) Provide Examples of situations where using a specific process model would be more Suitable?

sol. i) Incremental model: when a project can be divided into Smaller functional increments, allowing certain modules to be develop and delivered independently while ensuring integrated and testing along the way.

ii) 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.

iii) waterfall model: When requirements, are stable and changes are minimal, making it possible to plan and execute the project in the linear sequence of phases.

iv) Agile model (Scrum): when flexibility and adaptibility are crucial and the project canbe divided into Smaller increments with frequent iterations, allowing for continuous feedback and changes.

6) Compare and contrast the waterfall model and agile methodologies in terms of project planning and progress tracking.

Sol^n:

i) waterfall model is the first approach used in software development process.

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

iii) Agile software development describes an approach to software development under which requirements and solutions evolve through the collaborative effort of self-organizing and cross functional teams and their customers.

iv) The term agile was popularized in the context, by the manifesto for agile software development.

v) It advocates adaptive planning, evolutionary development, early delivery and continual improvement, and it encourages rapid and flexible responses to change.

7) Apply process metrics to evaluate the efficiency and effectiveness of waterfall, agile methodologies considering factors such as development speed etc.

Sol^n: 1) waterfall

Development Speed:

i) 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.

Adaptability to change:

ii) waterfall is less adaptable to changes due to its rigid structure.

Customer Satisfaction:

III) waterfall may have limited customer involvement.

2) Agile:

Development Speed:

i) Agile methodology emphasize incremental development, allowing for quicker delivery of working features.

ii) Adaptability to change:

ii) Agile methodologies are highly adaptable to changing requirements due to regular iteration and flexibility.

Customer Satisfaction:

III) Agile methodologies involve continuous customer feedback and collaboration, leading to improved satisfaction.

Q8)
Ans

Features	Waterfall model	Incremental model	Prototyping model	Spiral model
Requirement Specification	well understood	not well understood	not well understood	not well understood
Understanding requirements	well understood	not well understood	not well understood	well understood
Availability of reusable components	No	yes	yes	yes
Risk	Beginning	no risk	no risk	yes
User Involvement	Beginning	Intermediate	High	High
Flexibility	Rigid	less	High	Flexible
Cost Control	yes	no	no	yes
Resource Control	yes	yes	no	yes
Expertise	High	High	medium	High
Implementation time	long	less	less	Depends on project