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9622

TE COMPS B

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SEMESTER / BRANCH: V/COMPUTER Engineering

SUBJECT: Software Engineering **(CSC502)/ First Assignment**

Date: 19-08-23 Due Date : 25-08-23

CSC502.1: Recognize software requirements and various process models. (Understanding)
CSC502.2: Develop project Plan, schedule and track the progress of the given project (Applying)

Questions :

1. What is the significance of recognizing software requirements in the software engineering process?
2. Describe the main characteristics of different process models used in software development.
3. How does the Capability Maturity Model (CMM) contribute to improving software development processes?
4. Explain the differences between prescriptive process models and evolutionary process models.
5. Provide examples of situations where using a specific process model would be more suitable.
6. Compare and contrast the Waterfall model and Agile methodologies in terms of project planning and progress tracking.
7. Apply process metrics to evaluate the efficiency and effectiveness of Waterfall , Agile (both Scrum & Kanban) methodologies, considering factors such as development speed, adaptability to change and customer satisfaction.
8. Justify the relevance of the following comparison for software development models.

Features	Water fall Model	Incremental Model	Prototyping Model	Spiral Model
Requirement Specification	Beginning	Beginning	Frequently Changed	Beginning
Understanding Requirements	Well Understood	Not Well Understood	Not Well Understood	Well Understood
Cost	Low	Low	High	Expensive
Availability of reusable component	No	Yes	Yes	Yes
Complexity of System	Simple	Simple	Complex	Complex

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Risk Analysis	Only at beginning	No risk analysis	No risk analysis	Yes
User involvement in all phases of SDLC	Only at beginning	Intermediate	High	High
Guarantee of Success	Less	High	Good	High
Overlapping Phases	Absent	Absent	Present	Present
Implementation Time	Long	Less	Less	Depends on Project
Flexibility	Rigid	Less flexible	Highly flexible	Flexible
Changes Incorporated	Difficult	Easy	Easy	Easy
Expertise Required	High	High	Medium	High
Cost Control	Yes	No	No	Yes
Resource Control	Yes	Yes	No	Yes

Rubrics :

Indicator	**Average**	**Good**	**Excellent**	**Marks**
Organization (2)	Readable with some mistakes and structured (1)	Readable with some mistakes and structured (1)	Very well written and structured (2)	
Level of content(4)	Minimal topics are covered with limited information (2)	Limited major topics with minor details are presented(3)	All major topics with minor details are covered (4)	
Depth and breadth of discussion(4)	Minimal points with missing information (1)	Relatively more points with information (2)	All points with in depth information(4)	
Total Marks(10)				

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SE Assignment.

Q1) What is significance of recognizing software requirements in the software engineering process?

→ As the technology changes the user requirements and enviden on which software is working also changes. So every organisation is ranked based on the software engineering principle used by the organisation.

→ Implementing and managing large size of software programmer requires a specific method and matubrize the tasks so that size of software don't harm the software quality.

software engineering provides methodology for implementing ~~for~~ implementing complex integration complex software system with high quality.

- Extending the previous software to add new functionality requires more cost in terms of time to develop and efforts taken by the people.

software engineering provides a way in

which software system can be able to scale as needed to future.

(Q2) i) Software processes are the activities for designing, implementing and testing for a software system.

ii) A software process model is an abstract representation of the development process.

(a) Perspective Process models.

① The name 'perspective' is given since the modal perscebile set of activities, action, task and change control mechanism for every project.

② whatever process model is chosen by the organisation but it should encompass the following framework.

① communication
② Planning
③ modeling
④ construction
⑤ Deployment.

(iii) Ex:- waterfall model, Incremental process models, Evolutionary process model.

(5) Agile Process Models

(1) It includes the concept of development along with a set of guidelines necessary for the development process.

(2) The development guidelines emphasizes on analysis and design activities and continuous communication between developer and customer.

(3) An agile team quickly responds to change as a result agile development process must be adaptable.

(4)

(5) Iterative model:- Similar to agile, but with more structured and defined process. Each iteration, may include a subset of the software functionality.
Allows for iterations, redefined features and easily feedback, suitable for projects with evolving requirements.

CMM Model

- developed by software Engineering Institute
- It defines a process or methodology used to establish / develop and refine an organization's software development process.

present s 2 types of meta models
- as continuous model
- as a staged model.

CMM provides the different levels based on the standards a company aquires.

new company - Level 1

CMM provides total 5 levels

1) Initial
2) Repeatable
3) Defined
4) managed
5) optimizing.

Level 1:- characterized as a ad hoc few process are define, success as individual efforts.

Level 2:- Basic projects managment process are established to track cost, schedule and functionality.

Level 3 :- At this level, processes for both managment and development activities are defined and document.

Level 4 :- At this level, focus is on olw metric
At this stage processes and product metric are collected.

Level 5 :- Continuous process improvement is enable

Perspective process	Evolutionary process
① to binary ades and structure	① do not establish the maximizes speed of the evolution.
② Refine a distinct set of activities, actions, tasks, milestones.	Evolutionary process models lacks flexibility, extensibility and high quality.

③ more popular	less popular.
④ provides complete and full developed system	Time does not allow a full and complete system to be developed.
⑤ For eg. waterfall model, Incremental model	Eg:- Prototyping, spiral.

① Waterfall model - ① requirements are well defined
② projects with a clear and stable scope.
③ Developing a microwave oven with fixed set of features and requirements.

② Agile model :- ① requirements likely to evolve and change during process.
② require flexibility and rapid iterations
③ mobile app based on feedback.

③ Spiral model:- ① high level of risk assesment and managment
② continuous refinement, early prototypes
③ Ex. complex medical device, extensive testing and validate.

④ Incremental model: ① divided into smaller, manageable parts
② delivered seperately
③ Ex E-commerce website.

⑤ CMM - ① improving and optimizing the development and management process with an integration.

Ex:- large financial institution that handles sensitive customer data, high level of security.

⑥ RAD - videogame prototype to demonstrate gameplay mechanisms.

Q7) 1. waterfall

Development speed.

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

Adaptibility to change:

waterfall is less adaptable to change in requirement due to its rigid structure. metrices. Customer feedback at the end of this project

2. Agile : Development speed:

Agile methodologies emphasize incremental development allowing for quicker delivery of working features metrices.

Q8)

Features	waterfall model	Incremental model	Prototyping model	spiral model
Requirement specification	well understood	Not well understood	Not well understood	well understood
Understanding of 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	Long	~~Yes~~ 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.