

Software Engineering and Project Management

Assignment

1. What do you mean by process and a project?

ans) Process :

A software process provides the framework from which a comprehensive plan for software development can be established. A process is a set of related activities that leads to the production of a software. A small number of framework activities are applicable to all software projects, regardless of their size or complexity.

A number of different task sets - tasks, milestones, work products and quality assurance points - enable framework activities to be adapted to the characteristics of the software project and requirements of the project team. Finally, umbrella activities overlay the process model.

Project :

A project is a temporary endeavor undertaken to accomplish a unique purpose. We conduct planned and controlled software projects for one primary reason - it is the only known way to manage complexity. And yet, all software teams still struggle. To avoid project failure, a software project manager and the software engineer who build

the product must avoid a set of common warning signs, understand the critical success factors that lead to good project management, and develop a commonsense approach for planning, monitoring and controlling the project.

2. List PMBOK knowledge areas.

ans) The Guide to the Project Management Body of Knowledge (PMBOK® Guide) documents 9 project management knowledge areas.

i) Project Integration Management

- Focuses on coordinating the plan's development, execution and control of changes.

ii) Project Scope Management

- Scope is the work to be completed by the project team.

- To assure that the project work is defined accurately and completely.

iii) Project Time Management

- Identify the projects' phases and activities.

- Estimate and assign resources for each activity.

iv) Project Cost Management

- To ensure that the projects' budget is developed and completed as approved.

- v) Project Quality Management
 - Focuses on planning, developing and managing a quality environment.
- vi) Project Human Resources Management
 - People are the most important resources.
 - Focuses on creating and developing project teams.
- vii) Project Communications Management
 - Communication is timely and accurate.
- viii) Project Risk Management
 - Concerned with identifying and responding appropriately to risks that can impact the project.
- ix) Project Procurement Management
 - To acquire resources (people, hardware, software etc.) that are outside the organisation.

3. Explain W5H1 principles.

ans) In an excellent paper on software reuse and projects, Barry Boehm states "you need an organising principle that scales down to provide simple [project] plans for simple projects". Boehm suggests an approach that addresses project objectives, milestones and schedules, responsibilities, management and technical approaches, and required resources. He calls it the

W⁵HH principle, after a series of questions that lead to a definition of key project characteristics and the resultant project plan:

- i) "Why is the system being developed?" All stakeholders should assess the validity of business reasons for the software work. Does the business purpose justify the expenditure of people, time and money?
- ii) "What will be done?" The task set required for the project is defined.
- iii) "When will it be done?" The team establishes a project schedule by identifying when project tasks are to be completed, conducted and when milestones are to be reached.
- iv) "Who is responsible for a function?" The role and responsibility of each member of the software team is defined.
- v) "Where are they located organizationally?" Not all roles and responsibilities reside within software practitioners. The customer, users, and other stakeholders also have responsibilities.
- vi) "How will the job be done technically and managerially?" Once product scope is established, a

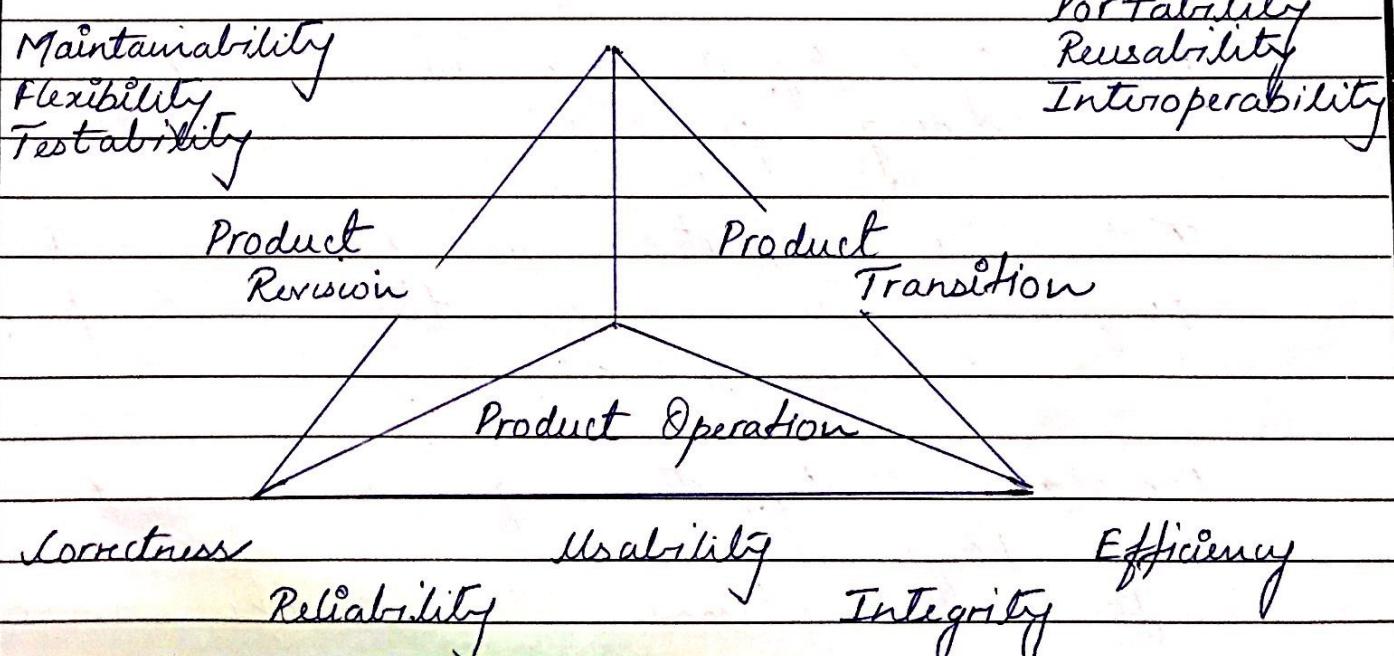
management and technical strategy for the project must be defined.

vii) "How much of each resource is needed?" The answer to this question is derived by developing estimates based on answers to earlier questions.

Boehm's WISH principle is applicable regardless of the size or complexity of a software project. The questions noted provide you and your team with an excellent planning outline.

4. Explain McCall's Quality Triangle.

McCall, Richards, and Walters propose a useful categorization of factors that affect software quality. These software quality factors focus on three important aspects of a software product: its operational characteristics, its ability to undergo change, and its adaptability to new environments.



Correctness : The extent to which a program satisfies its specification and fulfills the customer's mission objectives.

Reliability : The extent to which a program can be expected to perform its intended function with required precision.

Efficiency : The amount of computing resources and code required by a program to perform its function.

Integrity : Extent to which access to software or data by unauthorised persons can be controlled.

Usability : Effort required to learn, operate, prepare input for, and interpret output of a program.

Maintainability : Effort required to locate and fix error in a program.

Flexibility : Effort required to modify an existing program.

Testability : Effort required to test a program to ensure that it performs its intended function.

Portability : Effort required to transfer the program from one hardware or software system to another.

Reusability : Extent to which a program [or parts of a program] can be reused in other applications.

Interoperability : Effort required to couple one system to another.

- 5) Which factor is decided for the success of the project?