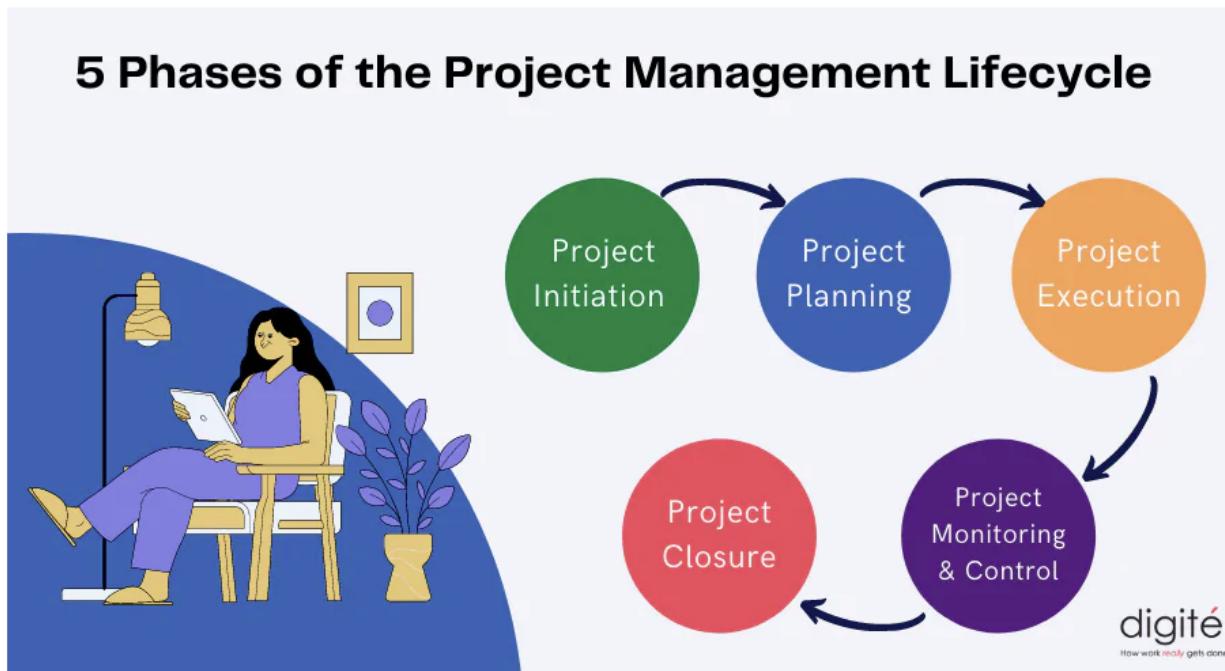


## 1. Explain the Project life cycle in detail

Ans)

### Project Management Life Cycle

A project life cycle provides a high-level view of the project and the phases are tailored to fit a project's needs providing a roadmap to accomplish it. The project management life cycle is divided into 5 phases: project initiation, planning, execution, monitoring & control, and closure.



### 1. Initiating

In the initiation phase, you will define the project. You will sort out the project goals, scope, and resources of the project and what roles are needed on the team. Clarifying what stakeholders expect out of the project, and what exactly the project is aiming to achieve (and why) will give the project and team clear direction.

This is a crucial phase to the project's success. Without clarity around what needs to be achieved and why the project runs the risk of not accomplishing the end results and meeting the expectations of stakeholders.

### 2. Planning

In the planning phase, you will determine the steps to actually achieve the project goals—the “how” of completing a project.

You will establish budgets, timelines, milestones, source materials, and necessary documents. This step also involves calculating and predicting risk, establishing change processes in place, and outlining communication protocols. If the initiation phase is assembling your troops, the planning phase is deciding what to do with them.

### **3. Execute and complete tasks**

Executing a project means putting your plan into action and keeping the team on track. Generally, this means tracking and measuring progress, managing quality, mitigating risk, managing the budget, and using data to inform your decisions.

Specific steps might include:

- Using tools like GANTT or burndown charts to track progress on tasks
- Responding to risks when they manifest
- Recording costs
- Keeping team members motivated and on task
- Keeping stakeholders informed of progress
- Incorporating changes via change requests

### **4. Monitoring & Controlling:**

Monitoring and Controlling consists of those processes performed to observe project execution so that potential problems can be identified in a timely manner and corrective action can be taken, when necessary, to control the execution of the project.

The key benefit is that project performance is observed and measured regularly to identify variances from the project management plan.

Monitoring and Controlling includes:

- Measuring the ongoing project activities (where we are);
- Monitoring the project variables (cost, effort, scope, etc.) against the project management plan and the project performance baseline (where we should be);
- Identify corrective actions to address issues and risks properly (How can we get on track again);
- Influencing the factors that could circumvent integrated change control so only approved changes are implemented

## **5. Close project**

In the closing phase of the project management lifecycle, you will conclude project activities, turn the finished product or service over to its new owners and assess the things that went well and did not go so well. It will also be a time to celebrate your hard work.

## **2. How to maintain software? Explain in detail.**

**Ans)**

Software maintenance is a part of the Software Development Life Cycle. Its primary goal is to modify and update software applications after delivery to correct errors and improve performance. Software is a model of the real world. When the real world changes, the software requires alteration wherever possible.

Software Maintenance is an inclusive activity that includes error corrections, enhancement of capabilities, deletion of obsolete capabilities, and optimization.

Need for Maintenance

Software Maintenance is needed for:-

- o Correct errors
- o Change in user requirement with time
- o Changing hardware/software requirements
- o To improve system efficiency
- o To optimize the code to run faster
- o To modify the components
- o To reduce any unwanted side effects.

Thus the maintenance is required to ensure that the system continues to satisfy user requirements.

Types of Software Maintenance:

### **1. Corrective Maintenance**

Corrective maintenance aims to correct any remaining errors regardless of where they may cause specifications, design, coding, testing, and documentation, etc.

### **2. Adaptive Maintenance**

It contains modifying the software to match changes in the ever-changing environment.

### **3. Preventive Maintenance**

It is the process by which we prevent our system from being obsolete. It involves the concept of reengineering & reverse engineering in which an old system with old technology is re-engineered using new technology. This maintenance prevents the system from dying out.

### **4. Perfective Maintenance**

It defines improving processing efficiency or performance or restricting the software to enhance changeability. This may contain enhancement of existing system functionality, improvement in computational efficiency, etc.

## **3. Explain Gantt Chart and WBS**

**Ans)**

Gantt Chart:

- A Gantt chart or more popularly known as the bar chart is one of the most commonly used project management tools and are used in tracking project schedules.

- Gantt chart provide a standard format for displaying project schedule information by listing project activities and their corresponding start and finish dates in a calendar format. These charts are also referred to as bar charts as activity start and finish dates are shown by horizontal bars.
- The primary reason for the popularity of the Gantt charts is because they are easy to plot and simple to understand. The Gantt adopts a very simple process of showing activities (tasks or events) displayed against time.
- A Gantt chart is a graphical representation of a project plan on a time scale. The X axis of the chart represents time i.e. project duration while the Y axis represents activities in the form of rectangular bars.

- Therefore, in simple terms a Gantt chart enables the

user to understand what has to be done i.e. the activities to be performed and when it is to be done i.e. the schedule of the activities.



### WBS:

- The primary requirement for project planning is the Work Breakdown Structure (WBS) for which the approved project scope statement is required. The WBS

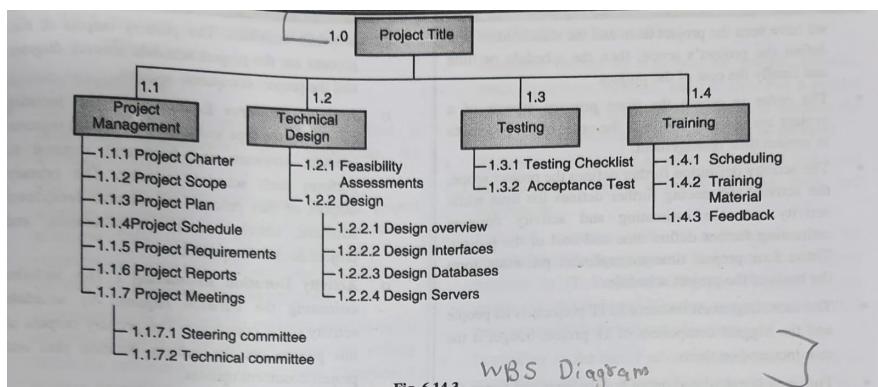
is a deliverable/product oriented hierarchical decomposition of the work to be executed by the project team, to accomplish the project objectives and create the required deliverables/project products.

- Decomposition indicates the breaking down of the project scope statement into smaller, more manageable components i.e. the project deliverables.

tasks is the main purpose of developing WBS. This method is used by project managers to simplify project execution as smaller work packages and activities are easier to manage. Following are the benefits for developing WBS in a project :

- WBS serves as an input to key project management activities, namely, cost budgeting, resource planning, risk management, activity definition, and schedule planning.
- WBS illustrates the project scope, so that every team member as well as stakeholder can have a better understanding of it.

- QUESTION**
- WBS facilitates accurate assignment of responsibilities to the project team.
  - WBS indicates the project milestones and control points.

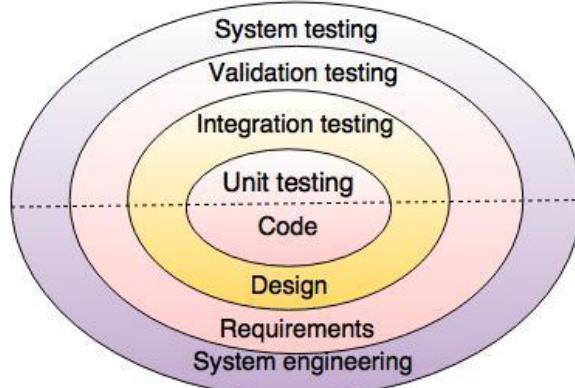


#### 4. Testing, Explain testing strategies

**Ans)**

Software testing is a process of identifying the correctness of software by considering its all attributes (Reliability, Scalability, Portability, Re-usability, Usability) and evaluating the execution of software components to find the software bugs or errors or defects.

A strategy of software testing is shown in the context of spiral.



**Fig. - Testing Strategy**

#### Unit testing

Unit testing is concerned with testing the smallest modules of the software. For each module, the module's interface is examined to ensure that information properly flows to and from the module. The data structures which are internal to the module should be examined to ensure that they remain in a consistent state as the module is used.

### **Integration testing**

Once unit testing is complete, the next important step is to combine the separate modules and ensure that they function correctly together. One may think that because each module functions correctly by itself that they will function correctly together. This is not always the case. For example, module A might have certain expectations about the behavior of module B that are not being met, causing A to function incorrectly.

### **Validation testing**

Unit and integration testing asks the question, “Are we developing the software correctly?” Validation testing, on the other hand, asks, “Are we developing the correct software?” In other words, validation testing is concerned with whether the software meets its requirements.

Validation testing focuses on the user-visible portions of the software, such as the user-visible inputs and outputs, and the software's actions. The tests examine these user-visible portions to ensure that they meet the software requirements. While not part of the software itself, the documentation should also be examined to ensure that they meet any requirements concerning them.

### **System testing**

System testing: The last high-order testing step falls outside the boundary of software engineering and into the broader context of computer system engineering. Software, once validated, must be combined with other system elements (e.g., hardware, people, databases). System testing verifies that all elements mesh properly and that overall system function/performance is achieved.

## **5. What is FTR, RFP, PMBOK Knowledge areas**

### **Ans) Formal Technical Review (FTR) in Software Engineering**

Formal Technical Review (FTR) is a software quality control activity performed by software engineers.

Objectives of formal technical review (FTR): Some of these are:

- Useful to uncover error in logic, function and implementation for any representation of the software.
- The purpose of FTR is to verify that the software meets specified requirements.
- To ensure that software is represented according to predefined standards.
- It helps to review the uniformity in software that is developed in a uniform manner.
- To make the project more manageable.

In addition, the purpose of FTR is to enable junior engineers to observe the analysis, design, coding and testing approach more closely. FTR also works to promote back up and continuity and become familiar with parts of software they might not have seen otherwise. Actually, FTR is a class of reviews that include walkthroughs, inspections, round robin reviews and other small group technical assessments of software. Each FTR is conducted as a meeting and is considered successful only if it is properly planned, controlled and attended.

### Request For Proposal (RFP):

Projects require resources, products and services that are not always available within the organization and for which the organization has to resort to external consultants, suppliers and agencies. To procure these products, resources and services the project manager has to correctly identify the needs of the project that cannot be met internally and then specify it in a document called the Request for Proposal or RFP.

- Developing an RFP is a time consuming process and begins by determining the project needs that cannot be fulfilled internally and for which the organization will need to avail the services of outside suppliers.

resources would be required.

The idea behind an RFP is to prepare a level playing field for all the prospective suppliers by stating in clear terms the requirements of the organization and all other technical specifications.

### PMBOK KNOWLEDGE AREAS:

• The Project Management Body of Knowledge

The PMBOK defines nine knowledge areas for understanding project management and are as follows:

- Project Integration Management Knowledge Area - This area includes the processes and

completion. Integration management focuses on coordinating the project plans development, execution, and control.

- Project Scope Management Knowledge Area : This area includes all the processes that are needed to ensure that project scope includes all the work required to be completed by the team, and only the



#### **Project Time Management Knowledge Area :**

This knowledge area includes the processes required to develop, monitor, and manage the project schedule such that the timely completion of the project is accomplished. Time management identifies project phases and activities and then estimates and sequences them. The assignment of resources to ensure the timely completion of the project.



#### **Project Cost Management Knowledge Area :**

This includes the processes involved in planning, estimating, budgeting and controlling costs so that the project can be completed within the approved budget.



#### **Project Quality Management Knowledge Area**

: Includes all the activities of the organization that determine qualities policies, objectives and responsibilities so that the project will satisfy or exceed the needs of the stakeholders for whom the project had been undertaken.



#### **Project Human Resource Management**

**Knowledge Area** - This area focuses on managing the most important resource on a project. It includes the processes that organize and manage the project team.



#### **Project Communication Management**

**Knowledge Area** : This area focuses on developing processes that are required to ensure timely, accurate, and appropriate generation, collection, distribution, storage, retrieval, and disposition of project information.



#### **Project Risk Management Knowledge Area :**

this includes all the processes associated with risk management planning, identification, response and monitoring on a project.



#### **Project Procurement Management Knowledge**

**Area** : All resources i.e. people, hardware or software, needed for the project may not be available within the organization and it may need to procure some from outside sources. The

## **6. Project management**

**Ans)** A project is a group of tasks that need to be completed to reach a clear result.

What is software project management?

**Software project management is an art and discipline of planning and supervising software projects.**

It is a procedure of managing, allocating and timing resources to develop projects that fulfills requirements. In software Project Management, the client and the developers need to know the length, period and cost of the project.

**There are three needs for software project management. These are:**

1. Time
2. Cost
3. Quality

It is an essential part of the software organization to deliver a quality product, keeping the cost within the client's budget and deliver the project as per schedule. There are various factors, both external and internal, which may impact this triple factor. Any of the three-factors can severely affect the other two.

### **4P's of project management**

Your project can help your team meet its goals and objectives. The four P's are :

1. People
2. Product
3. Process
4. Project

**Note: If it comes for 5 marks include life cycle as well.**

## **7. S/w quality**

**Ans)** Software Quality: Software Quality is defined as the conformance to explicitly state functional and performance requirements, explicitly documented development standards, and inherent characteristics that are expected of all professionally developed software.

**Importance of Quality**

**Increasing criticality of software:** The final customer or user is naturally concerned about the general quality of software, especially its reliability. This is increasing in the case as

organizations become more dependent on their computer systems and software is used more and more in safety-critical areas. For example, to control aircraft.

**The intangibility of software:** This makes it challenging to know that a particular task in a project has been completed satisfactorily. The results of these tasks can be made tangible by demanding that the developers produce 'deliverables' that can be examined for quality.

**Accumulating errors during software development:** As computer system development is made up of several steps where the output from one level is input to the next, the errors in the earlier or deliverables will be added to those in the later stages leading to accumulated determinable effects. In general the later in a project that an error is found, the more expensive it will be to fix.

**Software quality metrics** are a subset of software metrics that focus on the quality aspects of the product, process, and project.

Software quality metrics can be further divided into three categories –

- **Product quality metrics**
- **In-process quality metrics**
- **Maintenance quality metrics**

## 8. Risk and types, management

**Ans)**

A risk is a **potential problem**. It's an activity or event that may compromise the success of a software development project.

“Risk is an uncertain future event with a probability of occurrence and potential for loss”

There are three main classifications of risks which can affect a software project:

**1. Project risks:** Project risks concern different forms of budgetary, schedule, personnel, resource, and customer-related problems. A vital project risk is schedule slippage. Since the software is intangible, it is very tough to monitor and control a software project.

**2. Technical risks:** Technical risks concern potential method, implementation, interfacing, testing, and maintenance issues. It also consists of an ambiguous specification, incomplete specification, changing specification, technical uncertainty, and technical obsolescence. Most technical risks appear due to the development team's insufficient knowledge about the project.

**3. Business risks:** This type of risks contain risks of building an excellent product that no one needs, losing budgetary or personnel commitments, etc.

### Other risk categories

- 1. Known risks :** These risks are unwrapped after the project plan is evaluated.
- 2. Predictable risks :** These risks are estimated from previous project experience.
- 3. Unpredictable risks :** These risks are unknown and are extremely tough to identify in advance.

### **Risk Management Steps:**

There are some steps that need to be followed in order to reduce risk. These steps are as follows:

#### **1. Risk Identification:**

Risk identification involves brainstorming activities. It also involves the preparation of a risk list. Preparation of the risk list involves identification of risks that are occurring continuously in previous software projects.

#### **2. Risk Analysis and Prioritization:**

It is a process that consists of the following steps:

- Identifying the problems causing risk in projects
- Identifying the probability of occurrence of problem
- Identifying the impact of problem
- Assigning values to step 2 and step 3 in the range of 1 to 10
- Calculate the risk exposure factor which is the product of values of step 2 and step 3
- Prepare a table consisting of all the values and order risk on the basis of risk exposure factor

For example,

TABLE (Required)

Risk No	Problem	Probability of occurrence of problem	Impact of problem	Risk exposure	Priority
R1	Issue of incorrect password	2	2	4	10
R2	Testing reveals a lot of defects	1	9	9	7
R3	Design is not robust	2	7	14	5

#### **3. Risk Avoidance and Mitigation:**

The purpose of this technique is to altogether eliminate the occurrence of risks. So the method to avoid risks is to reduce the scope of projects by removing non-essential requirements.

#### **4. Risk Monitoring:**

In this technique, the risk is monitored continuously by reevaluating the risks, the impact of risk, and the probability of occurrence of the risk.

This ensures that:

- Risk has been reduced
- New risks are discovered
- Impact and magnitude of risk are measured

### **9. Architectural Design? Component design,**

**Ans)**

*Architectural Design:*

The software needs the architectural design to represent the design of software. IEEE defines architectural design as “the process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computer system.”

The use of architectural styles is to establish a structure for all the components of the system.

#### **1] Data centered architectures:**

- A data store will reside at the center of this architecture and is accessed frequently by the other components that update, add, delete or modify the data present within the store.
- This data-centered architecture will promote integrability. This means that the existing components can be changed and new client components can be added to the architecture without the permission or concern of other clients.

#### **2] Data flow architectures:**

- This kind of architecture is used when input data is transformed into output data through a series of computational manipulative components.
- Pipes are used to transmit data from one component to the next.
- Each filter will work independently and is designed to take data input of a certain form and produce data output to the next filter of a specified form.

#### **3] Call and Return architectures:**

It is used to create a program that is easy to scale and modify.

- **Remote procedure call architecture:** This component is used to present in a main program or subprogram architecture distributed among multiple computers on a network.

- **Main program or Subprogram architectures:** The main program structure decomposes into a number of subprograms or functions into a control hierarchy.

**4] Object Oriented architecture:** The components of a system encapsulate data and the operations that must be applied to manipulate the data. The coordination and communication between the components are established via the message passing.

## 5] Layered architecture:

- A number of different layers are defined with each layer performing a well-defined set of operations.
- At the outer layer, components will receive the user interface operations and at the inner layers, components will perform the operating system interfacing(communication and coordination with OS)
- Intermediate layers to utility services and application software functions.

### *Component Design:*

Component level design is the definition and design of components and modules after the architectural design phase.

- Component-level design defines the data structures, algorithms, interface characteristics, and communication mechanisms allocated to each component for the system development.
- A complete set of software components is defined during architectural design. But the internal data structures and processing details of each component are not represented at a level of abstraction that is close to code.

### Characteristics of Components

- **Reusability** – Components are usually designed to be reused in different situations in different applications. However, some components may be designed for a specific task.
- **Replaceable** – Components may be freely substituted with other similar components.
- **Not context specific** – Components are designed to operate in different environments and contexts.
- **Extensible** – A component can be extended from existing components to provide new behavior.
- **Encapsulated** – A component depicts the interfaces, which allow the caller to use its functionality, and do not expose details of the internal processes or any internal variables or state.
- **Independent** – Components are designed to have minimal dependencies on other component

## **10. User interface design**

**Ans)**

User interface is the front-end application view to which user interacts in order to use the software. Users can manipulate and control the software as well as hardware by means of user interface.

The software becomes more popular if its user interface is:

- Attractive
- Simple to use
- Responsive in a short time
- Clear to understand
- Consistent on all interfacing screens

UI is broadly divided into two categories:

### **Command Line Interface (CLI):**

CLI is the first choice of many technical users and programmers. It provides a command prompt, the place where the user types the command and feeds it to the system. The user needs to remember the syntax of the command and its use. CLI uses less computer resources as compared to GUI.

A text-based command line interface can have the following elements:

- Command Prompt
- Cursor
- Command

### **Graphical User Interface (GUI):**

Graphical User Interface provides the user with graphical means to interact with the system. GUI can be a combination of both hardware and software. Typically, GUI is more resource-consuming than that of CLI. With advancing technology, the programmers and designers create complex GUI designs that work with more efficiency, accuracy, and speed.

A GUI system has the following elements such as:

- Window
- Tabs
- Menu
- Icon
- Cursor, etc.

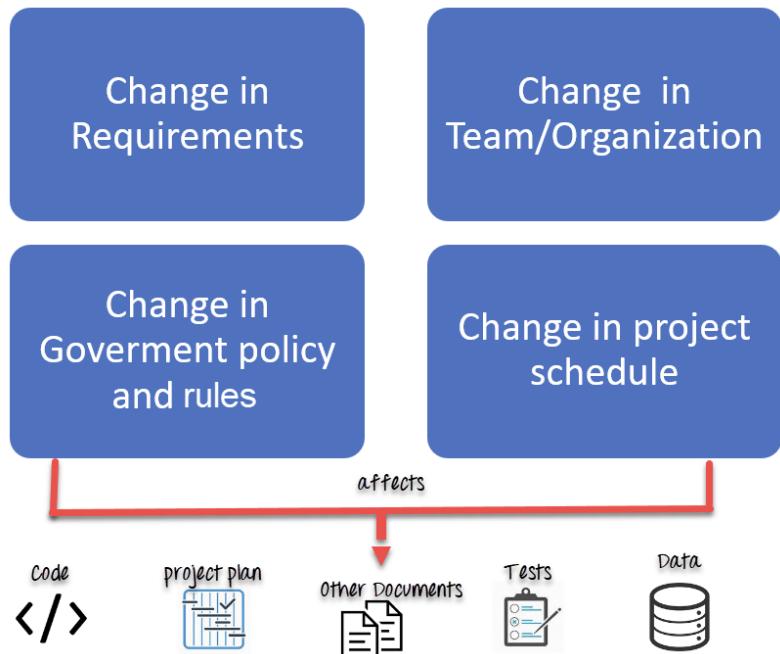
The user interface design process is categorized into 4 activities which are as follows:

- **Interface Analysis:** It evaluates the UI design with end-users in order to understand the users who will interact with the system through UI design, to confirm the tasks that the user will perform to complete their work, to understand the environment in which these tasks will be conducted, to understand the content of the interface. Once all requirements are gathered, the end-user carries out the task analysis.
- **Interface Design:** It defines the interface objects and actions that allow the user to perform all tasks that are defined in the user requirements analysis phase.
- **Implementation:** It involves prototyping and then the actual implementation. The output of the prototyping is used for the implementation.
- **Interface Validation:** It validates the ability of the user interface to implement every user task correctly, and user acceptance of the interface as an efficient tool in their work.

## 11. SCM

**Ans)**

In Software Engineering, Software Configuration Management(SCM) is a process to systematically manage, organize, and control the changes in the documents, codes, and other entities during the Software Development Life Cycle. The primary goal is to increase productivity with minimal mistakes.



Any change in the software configuration Items will affect the final product. Therefore, changes to configuration items need to be controlled and managed.

Tasks in SCM process

#### **Configuration Identification:**

Configuration identification is a method of determining the scope of the software system. With the help of this step, you can manage or control something even if you don't know what it is.

#### **Baseline:**

A baseline is a formally accepted version of a software configuration item. It is designated and fixed at a specific time while conducting the SCM process.

#### **Change Control:**

Change control is a procedural method which ensures quality and consistency when changes are made in the configuration object.

#### **Configuration Status Accounting:**

Configuration status accounting tracks each release during the SCM process. This stage involves tracking what each version has and the changes that lead to this version.

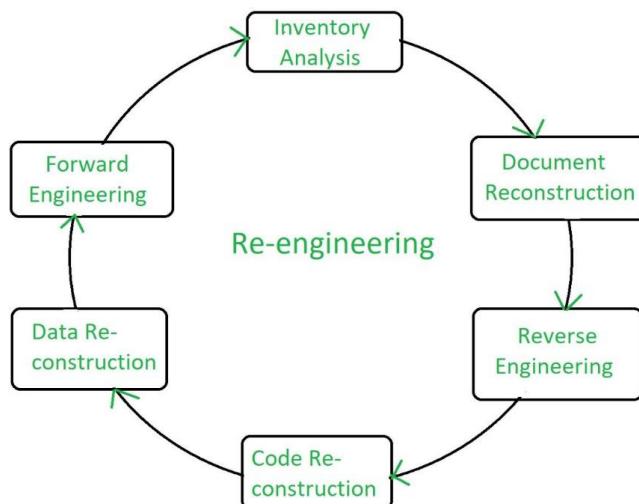
#### **Configuration Audits and Reviews:**

Software Configuration audits verify that all the software product satisfies the baseline needs. It ensures that what is built is what is delivered.

## **12. Software Reengineering?**

**Ans)** Software Re-engineering is a process of software development which is done to improve the maintainability of a software system. Re-engineering is the examination and alteration of a system to reconstitute it in a new form. This can include updating the software to work with new hardware or software platforms, adding new features, or improving the software's overall design and architecture.

Steps of software re-engineering process:



## **1. Inventory analysis:**

1. An inventory should be made to store all the applications in every organization.
2. The inventory can be a spreadsheet model containing information that provides a detailed description of every active application.
3. Resources can be allocated to candidate applications for re-engineering work.

## **2. Document restructuring:**

1. Documentation of a system helps in explaining either how it operates or how to use it.
2. Full re-documentation of an application may not be necessary. Rather, those portions of the system that are currently undergoing change are fully documented.
3. Over time, a collection of useful and relevant documentation will evolve.

## **3. Reverse engineering:**

1. Reverse engineering is a process of design recovery.
2. The reverse engineering tools extract data, and architectural, and procedural design information from an existing program.

## **4. Code restructuring:**

1. To accomplish code restructuring, the source code is analyzed using a restructuring tool. Violations of structured programming constructs are noted, and code is then restructured.
2. The resultant restructured code is reviewed and tested to ensure that no anomalies have been introduced. Internal code documentation is updated.

## **5. Data restructuring:**

1. Data restructuring begins with a reverse engineering activity.
2. Current data architecture is dissected, and necessary data models are defined.
3. Data objects and attributes are identified, and existing data structures are reviewed for quality.

## **6. Forward engineering:**

1. Forward engineering, also called renovation or reclamation, recovers design information from existing software.

2. It uses this information to alter or reconstitute the existing system in an effort to improve its overall quality.

## 13.4p's, CPM and PERT

### Ans) 4 P's of project management

Your project can help your team meet its goals and objectives. The four P's are :

#### **1. People**

Identifying the roles people play in almost any given project is the first step to a successful project. People are the primary resource on every project, and a well-managed team can greatly increase the chances for success.

#### **2. Product**

As the name implies, this is the deliverable of the project. The project manager should define the product scope to ensure a successful outcome as well as technical hurdles that he or she may encounter. The product of a project can also be something that is intangible; such as moving a company to a new headquarters or setting up a new company.

#### **3. Process**

Project managers and team members should have a methodology and plan that outlines their approach. Without a clearly defined process, team members will not know what to do and when to carry out project activities. Using the right process will increase the project execution success rate that meets its original goals and objectives.

#### **4. Project**

The Project Manager must guide team members to achieve the project's goals and objectives.

The project manager must delegate tasks, help team members when needed, and ultimately strive to accomplish all requirements set forth in the project scope.

### CPM & PERT:

- CPM (Critical Path Method) and PERT (Programme Evaluation and Review Technique) are network techniques used for planning, scheduling and executing large projects which require coordination and execution of a variety of complex and large number of activities.
- These activities have to be completed within a specified time, cost and meeting the performance standards.

### **CPM**

1. This technique was developed in connection with a construction and maintenance project in which duration of each activity was known with certainty.
3. It is used for completion of projects involving activities of repetitive nature.

### **PERT**

1. It assumes a probability distribution for the duration of each activity. Thus completion time estimates for all of the activities are needed.

### **Object Scheduling) ... Page no. (6-65)**

2. To perform PERT analysis on a project, the emphasis is given on the completion of a task rather than the activities required to be performed to reach to a particular event or task. Thus, it is also called an event-oriented technique.
3. It is used for one time projects involving activities of non-repetitive nature (i.e. activities which may never have been performed before) in which time estimates are uncertain.

## **14.Explain W5HH Principle**

**Ans)**

The W5HH principle in software management exists to help project managers guide objectives, timelines, responsibilities, management styles, and resources.

W5HH questions :

**Why is the system going to be developed?**

For the purpose of software work, all stakeholders must assess the validity of the system product/project. Here Barry questions whether the project's purpose will justify the cost, time spent on it by people?

**What activities need to be done in this?**

In this Barry questions what task is needed to be done for a project currently.

### **When is this done?**

Project Scheduling is done by the team after recognizing when project tasks will be started and when they enter into the final stage to reach the goal.

### **Who are the reasons for these activities in this project?**

Every member who is part of the software team is responsible for this. And their roles are defined.

### **Where are these authoritatively located?**

Not only do software practitioners have roles in this but also users, customers, stakeholders also have roles and responsibilities organizationally.

### **How is the job technically and managerially finished?**

All technical strategies, management rules of the project are defined after knowing the scope of the project which is being built.

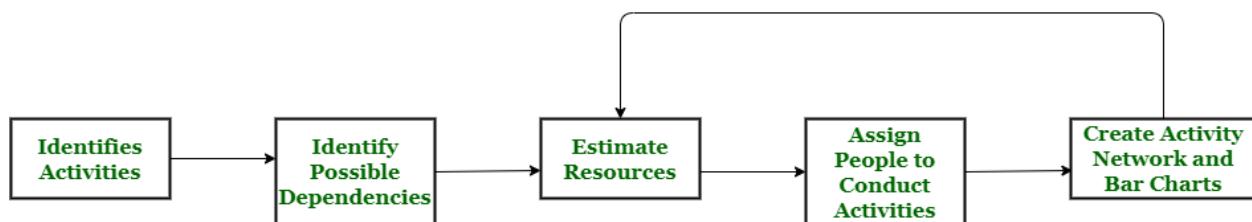
### **How much part of each resource is required?**

This is known by software developers after the estimation of each resource as per the needs of customers/users.

The **W5HH principle** outlines a series of questions that can help project managers more efficiently manage software projects. Each letter in W5HH stands for a question in the series of questions to help a project manager lead. (Notice there are five "W" questions and two "H" questions).

## **15. Project Scheduling.**

**Ans)** Project schedule simply means a mechanism that is used to communicate and know that tasks are needed and have to be done or performed and which organizational resources will be given or allocated to these tasks and in what time duration or time framework is needed to be performed. Effective project scheduling leads to success of the project, reduced cost, and increased customer satisfaction. The most common and important form of project schedule is the Gantt chart.



## **Project Scheduling Process**

Process :

The manager needs to estimate time and resources of the project while scheduling the project. Activities should be arranged in a logical and well-organized manner for easy to understand. Estimates can be made when all favorable things will happen and no threats or problems take place. The total work is separated or divided into various small activities or tasks during the project schedule. Then, the Project manager will decide the time required for each activity or task to get completed. Even some activities are conducted and performed in parallel for efficient performance.

**Advantages of Project Scheduling:**

There are several advantages provided by project schedule in our project management:

- It simply ensures that everyone remains on the same page as far as tasks get completed, dependencies, and deadlines are met.
- It helps in identifying issues early and concerns such as lack or unavailability of resources.
- It also helps to identify relationships and to monitor processes.
- It provides effective budget management and risk mitigation.

**16.Explain corrective maintenance and solve the following:**

**A Web application is to be improved to enhance**

**a )its security features.**

**b)Response time.**

**c)for additional functionalities**

**Recommend the type of maintenance for each of these.**

**(Prepare similar question)**

**Ans) [NOT SURE ABOUT THE FORMAT OF ANSWER]**

Corrective maintenance refers to the maintenance activities performed to fix or correct any issues or defects found in a software application after it has been deployed. This type of maintenance is typically performed in response to a problem, such as a bug, error, or security vulnerability.

To enhance the security features of a web application, the recommended type of maintenance is preventive maintenance. Preventive maintenance is a type of maintenance that is performed to prevent future problems from occurring. This can include activities such as performing security audits, implementing new security features, and updating software libraries to address known vulnerabilities.

To improve the response time of a web application, the recommended type of maintenance is adaptive maintenance. Adaptive maintenance is a type of maintenance that is performed to modify an application to better meet changing user needs or environmental conditions. This can include activities such as optimizing code, adding caching mechanisms, or scaling up the underlying infrastructure to handle increased traffic.

To add additional functionalities to a web application, the recommended type of maintenance is perfective maintenance. Perfective maintenance is a type of maintenance that is performed to improve an application's existing features or to add new features. This can include activities such as implementing new user interfaces, adding new functionality, or improving the overall user experience.

In summary:

- To enhance security features: Preventive maintenance
- To improve response time: Adaptive maintenance
- To add additional functionalities: Perfective maintenance

## **17. maintenance solution for following**

**problem: Developers have just launched their software.  
They learn that users are unable to log on to the  
application via their social media credentials due to a  
small defect in the applications authentication code that  
communicates with the social media platform.**

**(Prepare similar question)**

**Ans) [NOT SURE ABOUT THE FORMAT OF ANSWER]**

Corrective maintenance is a type of maintenance that is performed to correct any issues or defects found in the software application after it has been deployed. In this case, the defect in the application's authentication code is preventing users from logging in via their social media credentials.

The first step in the corrective maintenance process would be **to identify the root cause** of the defect. This would involve analyzing the code to determine where the defect is occurring and what is causing it. Once the root cause has been identified, the developers can begin working on a fix for the defect.

The next step in the process would be to **fix the code** to enable communication with the social media platform. This may involve making changes to the authentication code, updating the API calls to the social media platform, or making other adjustments as needed.

Once the fix has been implemented, the developers would need to **test the updated application** to ensure that the fix works as intended. This testing would involve verifying that users can now log in via their social media credentials without any issues.

If the testing is successful, **the updated application can be deployed** to production. It is important to ensure that the updated application is thoroughly tested and validated before it is deployed to production to avoid any additional defects or issues.

Finally, it would be a good practice to **conduct a post-mortem analysis of the defect** to identify any underlying issues in the development process that led to the defect in the first place. This analysis can help prevent similar defects from occurring in the future and improve the overall quality of the software application.