

- ① A project is defined as a set of well-defined tasks which is a collection of several operations done in order to achieve a goal.

## Project?

- A project is well-defined task, which is a collection of several operations done in order to achieve a goal
- A Project can be characterized as:
  - Every project may has a unique and distinct goal.
  - Project is not routine activity or day-to-day operations.
  - Project comes with a start time and end time
  - Project ends when its goal is achieved hence it is a temporary phase in the lifetime of an organization
  - Project needs adequate resources in terms of time, manpower, finance, material and knowledge-bank

### ② Categories of Projects (Characteristics):

- ① A project may have a unique and distinct goal.
- ② A project is not a routine activity or day-to-day operations.
- ③ A project comes with a start time & end time.
- ④ A project is a temporary phase in the organization's lifetime because it ends when the goal is achieved.
- ⑤ A project needs adequate resources (time, manpower, finance, material, knowledge-bank...)

## Software Project Management?

- Software in project management is dedicated to the planning, scheduling, resource allocation, execution, tracking, and delivery of software and web projects.
- Project management in software engineering is distinct from traditional project management.
- Software in project management has a unique life cycle process that requires multiple rounds of testing, updating, and customer feedback.
- ② Software in project management focuses on planning, scheduling, resource allocation, execution, tracking and delivery of software and web projects
- ③ The lifecycle of software in project management involves,
  - ① Multiple rounds of testing,
  - ② Updating
  - ③ Customer Feedback

Software  
Creation

Software  
Project Management

## Software Project?

- A Software Project is the complete procedure of software development from requirement gathering to testing and maintenance, carried out according to the execution methodologies, in a specified period of time to achieve intended software product.
- The job pattern of an IT company engaged in software development can be seen split in two parts:
  - Software Creation
  - Software Project Management

- ② A software project is defined as the complete procedure of software development from requirement gathering to testing and maintenance, carried out according to execution methodologies, in a specific time period to achieve intended software product

## Software Project Management?

- Software project management is aimed to ensure that the software is delivered on time, within budget and schedule constraints, and satisfies the requirements of the client
- Management of software projects is different from other types of management because:
  - Software is not tangible
  - Software processes are relatively new and still "under trial"
  - Larger software projects are usually "one-off" projects
  - Computer technology evolves very rapidly
- ② Software project management is aimed to,
  - ① Deliver the software on time
  - ② Deliver the software within budget
  - ③ Software satisfies the client's requirements.

## Need of Software Project Management

① Software Management is different from other management because,

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- ② Software processes are new and still under trial
- ③ Larger software projects are usually "one-off" projects.
- ④ Computer technology evolves rapidly

## Need of software project management

- Triple constraints for software projects.
  - Time
  - Cost
  - Quality
- It is an essential part of software organization to deliver quality product, keeping the cost within client's budget constrain and deliver the project as per scheduled.
- There are several factors, both internal and external, which may impact this triple constrain triangle
- Any of three factor can severely impact the other two.
- Therefore, software project management is essential to incorporate user requirements along with budget and time constraints.

② We need to deliver quality software product, keeping the cost within the client's budget constrain and deliver the project as per scheduled.



[Triple constraints for Software Projects]

## Need of software project management

- Software is said to be an intangible product.
- Software development is a kind of all new stream in world business and there's very little experience in building software products.
- Most software products are tailor made to fit client's requirements.
- The most important is that the underlying technology changes and advances so frequently and rapidly that experience of one product may not be applied to the other one.
- All such business and environmental constraints bring risk in software development hence it is essential to manage software projects efficiently.
- ② Latest rapid technology changes and advancements are main reason for the experience in developing a software product being not able to apply to another one.
- ② We need to manage software projects efficiently because business and environmental constraints can bring risks to it.

## Software Project Manager?



## Software project manager?

- Person who undertakes the responsibility of executing the software project.
  - Software project manager is thoroughly aware of all the phases of SDLC that the software would go through.
  - Project manager may never directly involve in producing the end product but he controls and manages the activities involved in production.
  - A project manager closely monitors the development process, prepares and executes various plans, arranges necessary and adequate resources, maintains communication among all team members in order to address issues of cost, budget, resources, time, quality and customer satisfaction.
- ① Software project manager is the person who is responsible for executing the software project
- ② He is aware of all the SDLC phases that the software would go through.
- ③ He controls and manages the activities involved in software production (But not directly involved)

## Software Project Management Activities

- ## Software project manager?
- Managing People
- ① Act as project leader
  - ② Communication and Cooperation with stakeholders
  - ③ Managing human resources
  - ④ Setting up reporting hierarchy

- Responsibilities of Project Manager
  - Managing People
    - Act as project leader
    - Liaison with stakeholders
    - Managing human resources
    - Setting up reporting hierarchy etc.
  - Managing Project
    - Defining and setting up project scope
    - Managing project management activities
    - Monitoring progress and performance
    - Risk analysis at every phase
    - Take necessary step to avoid or come out of problems
    - Act as project spokesperson

### Managing Project

- ① Setting up project scope
- ② Managing project management activities
- ③ Monitoring progress and performance
- ④ Risk analysis
- ⑤ Act as project spokesperson

### Responsibilities of Project Manager



## Software Management Activities

- Software project management comprises of a number of activities, which contains planning of project, deciding scope of software product, estimation of cost in various terms, scheduling of tasks and events, and resource management.
  - Project management activities may include:
    - 1. Project planning and Tracking
    - 2. Project Resource Management
    - 3. Scope Management
    - 4. Estimation Management
    - 5. Project Risk Management
    - 6. Scheduling Management
    - 7. Project Communication Management
    - 8. Configuration Management
- Project Management Activities
- ① Project planning and tracking
  - ② Project resource management
  - ③ Scope management
  - ④ Project risk management
  - ⑤ Scheduling management
  - ⑥ Estimation management
  - ⑦ Project risk management
  - ⑧ Configuration Management

## Software Management Activities

1. **Project Planning:** Task that is performed before product construction starts.
  - It is a set of multiple processes, or we can say that it is a task that is performed before the construction of the product starts.
2. **Scope Management:** It describes the scope of the project.
  - It describes the scope of the project defining what would do and what would not.
  - Scope management is important because it clearly defines what would do and what would not.
  - Scope Management create the project to contain restricted and quantitative tasks, which may merely be documented and successively avoids price and time overrun.

## Software Management Activities

### 3. Project Estimation:

- For an effective management accurate estimation of various measures is a must.
- With correct estimation managers can manage and control the project more efficiently and effectively.
- Project estimation may involve the following:
  - Software size estimation
  - Effort estimation
  - Time estimation
  - Cost estimation

• Project estimation should focus on software size, effort, time and cost estimation such that managers can manage and control the project effectively and efficiently.

## Software Management Activities

### 2. Scope Management:

- During Project Scope management, it is necessary to:
  - Define the scope
  - Decide its verification and control
  - Divide the project into various smaller parts for ease of management
  - Verify the scope
  - Control the scope by incorporating changes to the scope

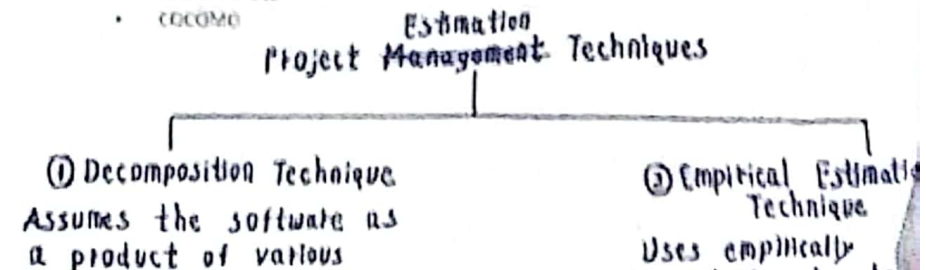
• During project scope management, we need to focus on,

- ① Defining the project scope
- ② Decide its verification and control.
- ③ Divide the project into smaller parts for ease of management.
- ④ Verify the scope
- ⑤ Controlling the scope by incorporating changes to the scope.

## Software Management Activities

### 3. Project Estimation:

- **Project Estimation Techniques**
  - **Decomposition Technique** - This technique assumes the software as a product of various compositions.
    - Line of Code Estimation
    - Function Points Estimation
  - **Empirical Estimation Technique** - This technique uses empirically derived formulae to make estimation.
    - Putnam Model
    - COCOMO





- ② Scheduling Management of a software refers to the order in which the software activities need to be completed along with the allocated time slots for each.

## Software Management Activities

### 4. Scheduling Management:

- Scheduling Management in software refers to all the activities to complete in the specified order and within time slotted to each activity.
- Project managers define multiple tasks and arrange them keeping various factors in mind.
- For scheduling, it is compulsory –
  - Find out multiple tasks and correlate them.
  - Divide time into units.
  - Assign the respective number of work-units for every job.
  - Calculate the total time from start to finish.
  - Break down the project into modules.

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- ① Find out multiple tasks and correlate them.
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- ⑤ Break down the project into modules.

## Software Management Activities

### 5. Project Resource Management:

- In software Development, all the elements are referred to as resources for the project.
- It can be a human resource, productive tools, and libraries.
- Resource management includes:
  - Create a project team and assign responsibilities to every team member.
  - Developing a resource plan is derived from the project plan.
  - Adjustment of resources.

- ② Points that show the risks in the project;

- ① Experienced team leaves the project and new team joins
- ② Changes in requirement
- ③ Changes in technologies and environment
- ④ Market competition

## Software Management Activities

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- ② In software development, all elements are referred to as resources for the project.

Eg:- Human resource, productive tools and libraries.

- ② Resource management includes,

- ① Create a project team and assign responsibilities to every team member.
- ② Developing a resource plan according to the project plan.
- ③ Adjustment of resources.

## Software Management Activities

### 6. Project Risk Management:

- Risk management consists of all the activities like identification, analyzing and preparing the plan for predictable and unpredictable risk in the project.
- Several points show the risks in the project:
  - The Experienced team leaves the project, and the new team joins it.
  - Changes in requirement.
  - Change in technologies and the environment.
  - Market competition.

- ② Project Risk management focuses on identification, analyzing and preparing the plan for predictable and unpredictable risks in the project.

- ② Communication is a bridge between clients, organization, team members as well as other stakeholders.

## Software Management Activities

### 7. Project Communication Management:

- Communication is an essential factor in the success of the project.
- It is a bridge between client, organization, team members and as well as other stakeholders of the project such as hardware suppliers.
- Communication management process may have the following steps:
  - **Planning** - identifications of all the stakeholders in the project and the mode of communication among them
  - **Sharing** - manager focuses on sharing correct information with the correct person on correct time
  - **Feedback** - use various measures and feedback mechanism and create status and performance reports
  - **Closure** - closure is formally announced
- In all the phases, communication must be clear and understood.
- Miscommunication can create a big blunder in the project.

### ② Communication management involves,

- ① Planning - Stakeholder and communication mode identification.
- ② Sharing - Sharing correct information with the correct person on correct time.
- ③ Feedback - Use various measures and feedback mechanisms.
- ④ Closure - Closure is formally announced.

## Software Management Activities

### 8. Project Configuration Management:

- People involved in Configuration Management:
  - Project Manager
  - Configuration Manager
  - Developers
  - User

### ② Tasks performed in configuration management:-

- ① Identification
- ② Baseline
- ③ Change control
- ④ Configuration status Accounting
- ⑤ Configuration Audits and Reviews

### ② People involved in configuration management-

- ① Project Manager
- ② Configuration Manager
- ③ Developers
- ④ Testers

- ② Configuration management focuses on controlling the changes in software like requirements, design and development of the product.

## Software Management Activities

### 8. Project Configuration Management:

- Configuration management is about to control the changes in software like requirements, design, and development of the product.
- The Primary goal is to increase productivity with fewer errors.
- Some reasons show the need for configuration management:
  - Several people work on software that is continually update
  - Help to build coordination among suppliers.
  - Changes in requirement, budget, schedule need to accommodate
  - Software should run on multiple systems
- Tasks perform in Configuration management:
  - Identification
  - Baseline
  - Change Control
  - Configuration Status Accounting
  - Configuration Audits and Reviews

### ② Reasons for the need of configuration management:-

- ① Many people work on software that is continuously updating.
- ② To build coordination among suppliers.
- ③ To accommodate changes in requirement, budget, schedule...
- ④ Software should run on multiple systems.

## Project Management Tools



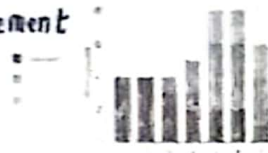
## Project Management Tools

- The risk and uncertainty rises multifold with respect to the size of the project, even when the project is developed according to set methodologies.
- There are tools available, which aid for effective project management.
  - Critical Path Analysis
  - Gantt Charts
  - PERT Charts
  - Resource Histograms



### Effective project management tools:-

- ① Critical Path Analysis
- ② Gantt Charts
- ③ PERT Charts
- ④ Resource Histograms



Staff	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Designer	4	4	3	3	2	2	1
Developer	0	0	1	2	4	4	3
Tester	0	0	0	0	2	2	2
Total	4	4	4	5	8	8	6

## Project Management Tools

- Taking non-development work off your team's plate to let them focus on the product
- Motivating your team by sharing others' success stories
- Avoiding any changes to tasks once assigned
- Trying to stick to the plan (until it needs to be changed)
- Encouraging organization by being organized yourself
- Streamlining productivity through effective delegation
- Getting to know your team and building a rapport
- Breaking down the plan and assigning specific daily tasks

- ① Let the team focus on the development work of the product.
- ② Motivate the team by sharing success stories of others.
- ③ Avoiding changes to tasks once assigned.
- ④ Trying to stick to the plan
- ⑤ Getting to know your team and building a rapport.

## Project Management Best Practices

## Summary