CHAPTER ONE: INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

A project is well-defined task, which is a collection of several operations done in order to achieve a goal (for example, software development and delivery).

A Project can be characterized as:

- Every project may have a unique and distinct goal.
- Project is not routine activity or day-to-day operations.
- Planning is required
- Work involves several specialisms
- Work is carried out in several phases
- 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.

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.

What is management?

- Planning – deciding what is to be done
- Organizing – making arrangements
- Staffing – selecting right people for the job
- Directing – giving instructions

- Monitoring – checking on progress
- Controlling – Taking action to remedy hold-ups
- Innovating – coming up with new solutions
- Representing – liaising with clients, users, developers, suppliers and other stake holders.
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Software project management

Software project management is a specialized discipline within the realm of project management that focuses on planning, executing, monitoring, controlling, and closing software development projects.

It encompasses the systematic management of resources, budget and time to ensure the successful completion of a software project and satisfy the requirements of the client.

SOFTWARE PROJECT MANAGEMENT ACTIVITIES

1. Project Planning: It is a set of multiple processes, or we can say that it a task that performed before the development of the product starts.

2. Scope Management: It describes the scope of the project. 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 cost and time overrun.

3. Estimation management: This is not only about cost estimation because whenever we start to develop software, but we also figure out their size (line of code), efforts, time as well as cost.

If we talk about the size, then Line of code depends upon user or software requirement.

If we talk about effort, we should know about the size of the software, because based on the size we can quickly estimate how big team required to produce the software.

If we talk about time, when size and efforts are estimated, the time required to develop the software can easily determine.

And if we talk about cost, it includes all the elements such as:

- Size of software
- Quality
- Hardware

- Communication
- Training
- Additional Software and tools
- Skilled manpower

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.

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.

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.

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.

From the planning to closure, communication plays a vital role. In all the phases, communication must be clear and understood. Miscommunication can create a big blunder in the project.

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 performed in Configuration management:

- Identification of configuration items
- Change Control
- Version management
- Release management
- Configuration Audits and Reviews etc

EFFECTIVE PROJECT MANAGEMENT

Effective project management focuses on 4p's

1. The people: Stakeholders, team leaders and the software team

Includes recruiting, selection, performance management, training, compensation, career development, organization and work design and team culture development.

2. The Problem/ Product: Before a project can be planned ;

- Its objectives and scope should be established.
- Alternative solutions should be considered.
- Technical and management constraints should be identified.

3. The Process: A software process provides the framework from which a comprehensive plan for software development can be established.

4. The Project: Planning and controlling a software project is done for one primary reason- to manage software complexity.

Importance of Effective Software Project Management

- **Efficient Resource Allocation:** Proper management of resources, including human resources, finances, time, and technology, helps optimize their utilization, leading to cost-effective and timely project delivery.
- **Clear Communication**: Software project management fosters transparent communication channels among team members, stakeholders, and clients. This clarity prevents misunderstandings, promotes alignment, and reduces the likelihood of errors.
- **Risk Mitigation:** Identifying and addressing potential risks early in the project lifecycle helps minimize their impact and ensure that projects stay on track despite unforeseen challenges.
- **Scope Control**: Defining and managing project scope prevents scope creep, ensuring that the project stays focused on its objectives and doesn't deviate unnecessarily, which can lead to time and cost overruns.
- **Quality Assurance**: Effective software project management includes quality assurance and testing processes, guaranteeing that the software meets the defined standards and fulfills user requirements.
- **Stakeholder Satisfaction**: Involving stakeholders throughout the project makes their expectations and needs more likely to be met, resulting in higher satisfaction levels.
- **Timely Delivery**: Through proper scheduling and monitoring, software project management ensures that projects are completed successfully on time, meeting critical deadlines.

SOFTWARE PROJECTS VS OTHER TYPES OF PROJECTS

	Feature	Software Project	Ordinary Project
1	Tangible	Not Tangible	It is tangible
2	End Product	Not clearly defined	Very clearly defined
3	Production	No fixed production plan, difficult to monitor and track	Fixed production plan which can be tracked
4	Productivity	Productivity varies greatly with change in technology or worker	Productivity does not vary much
5	Project Methodology	Varies widely based on project	Typically standard
6	Management methodology	Managing a software project is more managing interpersonal communication and less administration.	It is more about maintaining schedule and good administration
7	Multitasking	Difficult to multitask the resources	Production resources can be used for multiple projects
8	Flexibility	It is very easy to change product as per customer requirement at any time.	Can be personalized to a certain extent, but difficult in the middle of the project
9	Leadership	Software Projects need leaders and managers, not just administrators.	A capable administrator is enough to run an ordinary project.
10	Complexity	More complex	less complex

PROBLEMS WITH SOFTWARE PROJECTS

i. Managers point of view

- Poor estimates and plans
- Lack of quality standards and measures
- Lack of guidance about making organizational decisions
- Lack of techniques to make progress visible
- Poor role definition – who does what?
- Incorrect success criteria

ii. Members' point of view

- Inadequate specification of work
- Management ignorance of I.T
- Lack of knowledge of application area
- Lack of standards
- Lack of communication
- Lack of quality control
- Changing software environment
- Changing statutory requirements
- Preceding activities not completed on time
- Lack of training

Project Success Factors

Some of the factors that influence projects and may help them succeed are

- Executive Support
- User involvement
- Experienced project managers
- Limited scope
- Clear basic requirements
- Formal methodology
- Reliable estimates