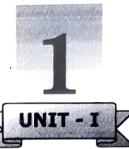


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Introduction to Software Project Management

Syllabus

Introduction to Software Project Management : Why is Software Project Management important? What is a Project? Contract Management, Activities Covered by Software Project Management, Plans, Methods and Methodologies, Some Ways of Categorizing Software Projects, Stakeholders, Setting Objectives, Business Case, Project Success, and Failure, what is Management? Management Control, Traditional versus Modern Project Management Practices. Case study : Online Shopping System.

1.1 Introduction to Project Management

- **Software Project Management (SPM)** is an effort taken to develop a unique software product or service. It involves :
 - Definite timeframe
 - Budget
 - Definite specifications
 - Working in organizational boundaries

Software Project Management :

- Creating a favorable environment to get critical projects done.
- Ensuring that software is delivered on time and in accordance with the requirements of the developing organization as well as procuring organization – This includes *defining, scoping, planning, staffing, organizing, directing, monitoring and controlling* a project to develop an acceptable system within the allotted time and budget.
 - It is an activity that documents, teaches, oversees the use and improves an organization's chosen methodology for system development.
 - Consistently applying phases, activities, deliverables and quality standards to the projects.
 - Applying tools/techniques, knowledge and skills to activities to meet the requirements of the project as well as to meet the stakeholder expectations.

1.1.1 Why is Software Project Management Important?

- Q. Why is software project management important ?

Oct.22 (In-Sem), 5 Marks

Software project management is needed to manage business and environment risks that occur during project development process :

- Many software products are developed according to client's requirements so they are only useful to those specific clients.
- The software products which are developed for business and used by business clients become outdated due to the introduction of newer and advanced technology in business. As the technology advances frequently, the product developed in a particular technology may not cope-up with new requirements and changes and therefore, it becomes outdated after some decades.

Software Project Management

Goal of Project Management : Developing Project within budget, time and scope.

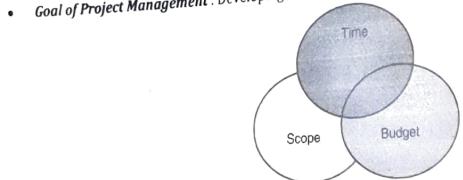


Fig. 1.1.1 : Goal of Project Management

1.2 What is a Project ?

Q. What is project?

Oct.22 (In-Sem), 5 Marks

Project :

- A project is a series of tasks that is carefully planned in order to achieve a particular outcome. Project can range from a simple to complex and can be managed by either individual or a team(s).
- Example:** Planning a wedding party is a project because it is a specific type of party to be held on a specific date and time which needs to be accomplished by proper planning and certain inputs and the party gives a specific service.
- A project requires :
 - Proper planning
 - Specific objectives
 - A time frame
 - Constrained resources

Software Project :

- Software project is a balance of three dimensions – *time, features and resources* with a goal of producing a successful software deliverable.
- To take up a new project, you need to take the *risk* and make an *investment* in order to get a *positive payoff*.
- Project Management supports three basic levels of projects : Projects, subprojects and programs.

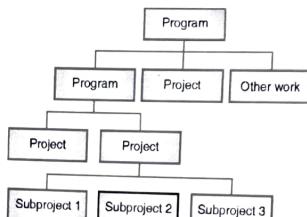


Fig.1.2.1 : Project Management levels

Software Project Management

- A project :** It ranges from simple to large that require much time, effort, and money.
- A sub project :** It refers to a part of a project managed with a level of independence.
- A program :** It is a group of related projects and other activities managed in a coordinated way to achieve a common long-term objective.

Difference between a Program and a Project :

Table 1.2.1 : Difference between Project and Program

Sr. No	Project	Program
1	Has a start and a finish	Consists of multiple projects with no start or finish
2	Has a set of defined deliverables	Scope can be very broad or very specific
3	Supports a tactical initiative	Supports a strategy or ongoing mission
4	Example : Updating all the computers in the hotel with one new version of software	Example : The ongoing IT support of all the computers in the hotel.

- Effective project management focuses on 4 P's i.e. the **People**, the most important element of a successful project, the **Product**, which has to be built, the **Process**, the set of tasks and activities to be executed, the **Project**, the combined work which makes the product a reality.

1.2.1 Software Projects v/s. Other Types of Projects

There are variety of projects apart from software project.

- Construction :** These projects deal with civil or architectural work. Predictive methods are used along with agile techniques.
- IT/Software :** These projects deal with software development, IT system etc. A SDLC model is used along with agile techniques.
- Business :** These projects deal with the development of a business, management of a work team, cost management, etc. A commercial strategy is usually followed.
- Service or Product production :** These projects deal with the development of an innovative product or service, or design of a new product, etc. such type of projects are often built in the R & D department.

Table 1.2.2 : Software Project v/s. Other Projects

Sr.No.	Software Project	Other types of Project
1.	Complexity : Testing the quality of software is difficult since so many paths and so many test cases to test.	Complexity : Testing the quality is comparatively easier. For example, bridges and buildings where everything is tested using known procedures.
2.	Invisibility : progress in software development is not immediately visible	Invisibility : Progress in construction of a bridge or building can actually be seen.
3.	Conformity : the ready software product should conform to the requirements of the clients.	Conformity : the ready product such as a bridge or building should confirm to the physical laws.

Software Project Management

Sr.No.	Software Project	Other types of Project
4.	Flexibility : when a software is migrated from one physical interface to another, it is expected that the software will change to accommodate the system.	Flexibility : difficult to make any changes in a built product such as difficult to make any type of changes in an already built building.
5.	Highly market driven and shorter release cycles	There is no concept of release cycles
6.	Much higher rate of failure due to immaturity of the discipline.	Rate of failure is much less. There is no much variance in the inputs and procedures used to build a product.
7.	High rate of technological change	Comparatively low rate of technological change
8.	Software is easier to copy and hack	Other types of projects are difficult to copy

1.3 Contract Management and Technical Project Management

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Q.	Describe contract management in detail.	
Sr. No.	Project Management	Contract Management
1.	Technical Project management is about planning and executing the project based on scope, time and budget. It is about managing all aspects of the project.	Contract management is a subcategory of Project management which takes care of the legal aspects related to the project such as contracts with vendors, leases and licensing agreements.
2.	Focuses on meeting the project goals such as product launches, building projects, and software development	It takes care of legal documents whenever the project work is contracted out. It ensures that the terms and commitments that are agreed upon in the contract are adhered to during the project development process. Offer by the company + customer reacts with changes to the offer + new offer by customer + acceptance by company and the customer = final contract agreement.
3.	Project manager meets the clients and works with them to build a plan	Contract managers help clients to understand the agreement they sign. They even work with the legal and financial departments of the organization to ensure the contract meets the needs of the organization.
4.	Activities of a Project Manager : <ul style="list-style-type: none"> • To develop a document that outlines project details • To report any delays in progress to the client • To work with vendors and third-party resources to outsource if required. • To meet all the standards and legal regulations and codes. 	Activities of a Contract Manager : <ul style="list-style-type: none"> • To research on competitive companies with similar projects • To manage the clerical personnel responsible for filling and editing paperwork (agreements). • To negotiate with stakeholders to ensure a win-win contract. • To explain the risks (if any) to clients based on points in the agreement.

Software Project Management**1.4 Software Project Management Activities**

- Activities involved in the Project Management :
 - Project Proposal Writing
 - Project planning and scheduling
 - Project costing
 - Project monitoring and reviews
 - Personnel selection and evaluation
 - Report writing and presentations
- The first four activities are grouped under the project planning, whereas the last two are performed when running the project. All these activities are performed iteratively.
- Writing a proposal is the initial step of a software project. While writing the project proposal it is needed to justify why the particular project is assigned to specific team or an organization. This proposal illustrates the project objectives and the plan to carry out the project. The cost and schedule estimation is also contained in the proposal.
- There may be various organizations competing to get specific project contract. And among several proposals only more effective proposal is accepted and awarded the contract to the respective organization. Many of the organizations' existence are depending on the number of proposals it have. That's why the proposal writing is a critical task. The proposal writing skill is achieved by experience.
- Project planning involves first identification of the activities, milestones and project deliverables, and then a plan is formed which is to be executed for developing the project to produce estimated product in time and with good quality.
- Cost estimation involves the estimation of resources which are needed to successfully carry out the project plan.
- An ongoing project activity, i.e. Project monitoring is done by project manager where he / she keeps examining the project progress and compare it with planned progress and costs. Many organizations use formal methods to do project monitoring. But also by informal discussion with project staff, a manager can understand the project progress.
- The Informal monitoring predicts the possible risks, for example, because of daily discussions with project staff the manager will know that
 - The project budget is low so instead of highly paid staff, less experienced and less well-paid staff should be assign to this project.
 - The appropriate experienced staff is assign to other important project so there is a need to hire new staff to the project.
 - The inexperienced staffs are developing their skills while working on that project and at least on project member is experienced and familiar with the system used to develop the project. If no one is experienced there may be chances of many simple mistakes made by the project members.
- The client and the organization who wins the contract get the report of the project by project manager. The Project manager also responsible to write short and abstract critical information from detailed project report and use this information during the progress reviews.

Responsibilities of a Project Manager :

- Q.** Identify the management responsibilities of the manager in view of software project management.
Oct.22 (In-Sem). 5 Marks

- A person who is responsible for the software project management is known as software project **manager**. He / She controls and monitors the project management activities performed while developing the software product. He / she is responsible to do following tasks :
- **The project manager manages the people :**
 - The project manager acts as project leader.
 - The project manager Liaison with stakeholders.
 - The project manager manages the human resources.
 - The project manager is responsible to set report hierarchy.
- **The project manager manages the project :**
 - The project manager defines and sets project scope.
 - The project manager handles the project management activities.
 - The project manager monitors the performance and progress of the project.
 - The project manager analyzes the risk at each phase of development and handles them if exists.
 - The project manager also acts as project spokesperson.

1.5 Project Planning

- Before starting the actual production the planning is done. It is an ongoing project management activity which starts from initial stage of the project development and continues till the project delivery.
- It involves creation of the set of plans which will help project members to guide and manage time, cost, quality, risks.
- Plans are regularly revised so as to avail the new updates.
- **Project planning involves following processes :**
 - **Scoping :** In project planning initial process is to define the project scope, and determining the appropriate methods to accomplish the project. In this in-scope requirements are specified which facilitates the work-breakdown structure creation.
 - **Preparing the work breakdown structure :** Followed by scope planning work breakdown structure is constructed. In this the project is spitted into tasks and subtasks, and forms a work breakdown structure by grouping and listing the required duration of various task to accomplish the work.
 - **Project scheduling :** This will list the schedules of activities involved in the project and the implementation sequences.
 - **Resource planning :** It includes the things which are responsible to accomplish the project. That is it will signify who will do what work? At which time? And if which special skills are needed to accomplish the tasks.
 - **Budget planning :** It will estimate how much cost or budget is required to accomplish the project. Also the required resources and the ways in which they are used to balance the cost and time are estimated.
 - **Risk management :** It involves the risk planning and mitigation strategy used to handle the risks.

- **Quality planning :** to generate the quality product. The quality of product is checked with respect to some already defined quality criteria.
- **Communication planning :** This will plan the communication strategy used to communicate with stakeholders.
- **Directing :** Project manager directs the different activities of his team members. He co-ordinates, delegates, motivates, advises, appraises and rewards his team members.
- **Controlling :** The project manager in order to avoid problems and delays, must continuously monitor and report progress against goals, schedule and costs and make appropriate adjustments whenever necessary.
- **Closing :** The last stage involves the project manager in assessing the project success and failure. He learns from the mistakes made and plans for continuous improvement of the project.

Need of software project management plan :

- It is a major part of project agreement.
- It controls the software development process.
- It describes the technical and managerial concepts involved in software development.
- It is a support for requirements analysis document.

Project plan is a document that defines :

- The scope (possible functions and limitations of the system), duration (time required to develop the system), cost (estimated budget) and deliverables for the project.
- System delivery dates, delivery location. Deliverables may be :
 - Documents – user manuals
 - Function descriptions
 - Non-functional requirement descriptions
 - Components descriptions

1.5.1 Structure of a Software Project Management Plan

- Front matter
- Title page
- Revision sheet (update history)
- Preface : Scope and purpose
- Tables of contents, figures, tables.

1. Introduction :

- i) **Project overview :** It involves summarized description of project and product.
- ii) **Project deliverables :** It involves the description of items to be delivered, their delivery dates and delivery location.
- iii) **Evolution of the SPMP (Software Project Management plan) :** It involves descriptions of anticipated and unanticipated changes.

iv) **References :** It includes complete list of materials referenced in SPMP.

v) **Keywords, Definitions and Acronyms.**

2. Project organization :

- i) **Process model :** Describes inter-relationships among various project elements regarding functions, activities, tasks, Milestones, Baselines, Reviews, Work breakdown structure, Project deliverables and Sign-offs.
- ii) **Organizational structure :** Describes internal management and organizational chart.
- iii) **Organizational interfaces :** Describes relations with other entities.
- iv) **Responsibilities :** Describes the major functions and activities.

States responsibility of each team member as who is in-charge of which activity.

3. Managerial process :

- i) **Management objectives and priorities :** Philosophy, goals and priorities.

ii) Assumptions, dependencies, constraints :

- o Assumption may be that the security will not be addressed.
- o Dependency may be that the automatic code generation facility in the CASE tool depends on JDK.
- o Constraints may be that the length of the project is 3 months. Limited amount of time to build the system or the project consists of beginners and so, it will take time to learn how to use the tools

iii) Risk management :

Identifying, assessing, tracking Contingencies for risks

Example :

- o **Risk :** Members in key roles drop the course.
- o **Contingency :** Roles are assigned to somebody else. Functionality of the system is renegotiated with the client.

Example :

- o **Risk :** The project is falling behind schedule.
- o **Contingency :** Extra project meetings are scheduled.

- iv) **Monitoring and controlling :** It involves the reporting mechanism of information flows and code reviews.

- iv) **Staffing Plan :** It describes the required skills needed for project management.

4. Technical process :

- i) **Methods, Tools and Techniques :** Computing system, development method, team structure, Standards, guidelines, policies.
- ii) **Software documentation :** Documentation plan, including milestones, reviews and baselines.
- iii) **Project support functions :** Plans for functions (quality assurance, configuration management).

5. Work Elements, Schedule, Budget :

- i) **Work packages (Work breakdown structure) :** Project decomposed into tasks; definitions of tasks.
- ii) **Dependencies :** Defines relations among the functions, activities and tasks in a priority.
- iii) **Resource requirements :** Lists the estimations of the resources such as development staff (personnel), development time, special hardware and support software, if any.
 - o **Budget and resource allocation :** Defines the costs related with functions, activities and tasks.
 - o **Schedule :** States the deadline, dependencies and the project milestones.

1.5.2 Project Communication and Documentation

Project Communication :

- A *Communication plan* is an important *document* of the project.
- *Communication and documentation* is a base for a successful project.

This communication plan includes ;

- Analysis of the stakeholders - Whom to notify if something goes wrong? How will the issues be communicated? and When to communicate?
- Background for the plan
- Clearly stated communication objectives.

Need of communication documentation :

- **It is a proof of performance :** If the communication plan is not documented, that means, it did not happen. And if you have documented it, that means, you agreed to do it.
- It is an agreement on how to proceed.
- It tracks the progress of the project.
- It provides a functioning interface between units.
- Helps in "end-to-end" thinking.
- It is an agreement on roles, tasks, schedule.

Project Documentation :

Various types of documents that are maintained while project management are ;

1. Project status report

- It covers the list of tasks and states the specific period of time in which it should get completed.
- It describes the completed as well as the tasks that were incomplete when they were scheduled.
- It lists the upcoming tasks, any issues that they have come across in the duration of the project, changes (if any) to the project schedule.
- It communicates the overall status of the project to all the team members.

2. Change management plan

- It describes what and how the change will be enforced in the course of the project.
- For example, if we are using a project management tool and sometime later, if another tool becomes available that is more user friendly than the one that is being used, then change management plan replaces the current tool with the new one, thus, ensuring that the transition runs more smoothly.

3. Risk management plan

- It includes anything that might go wrong in the various stages of the project development such as the risks associated with project planning process.

4. Closing reports

- This report is created to ensure that the project has been completed.
- It communicates to the stakeholders about what the project consists of.
- The stakeholders can look back at the project and see what succeeded and what didn't work.
- It acts as a valuable resource for the future when project managers take over a similar kind of project.

1.5.3 Plans, Methods and Methodologies

Q. How plans, methods and methodologies differ from each other?

Oct.22 (In-Sem), 5 Marks

- Plan :** It includes some planned phases and a method or a procedure of work.

- Elicit the requirements
- Analyse the requirements
- Design the test cases
- Design the model
- Build the code
- Test the code
- Compare actual and expected results
- Install
- Maintain

- Method :** It is an activity defined in the plan. The plan converts the method into real activities so as to achieve a goal. The method includes :

- Activity start and end date
- Who is responsible to carry out that activity
- What tools and resources are required to perform that activity

- Methodologies :** The output of one method might be the input to perform the next method. Group of all such methods or techniques forms a methodology such as an OOA (Object Oriented Analysis) or an OOD (Object Oriented Design).

1.5.4 Categorizing software Projects**Compulsory v/s. Voluntary users**

There are some tasks that the users of the system have to compulsorily do such as billing the products and in such case developers can get precise requirements of that task but there are also tasks that are voluntary such as in case of the computer games - while developing gaming software, developers cannot get precise requirements.

- Operating system :** the system that boots a digital system.

Examples : Windows OS, Linux OS

2. Information systems v/s. Embedded Systems

- Information System :** the system interfaces with the organization. An inventory management system is an information system that controls the stock when the organization reorders the stock.
- Embedded System :** the system interfaces with the machine. A process control system might control the CCTV cameras in a building.

3. Outsourced projects

While developing a large and complex project, some parts of the project are out sourced to other companies in the cases when the company doesn't have sufficient expertise, or the company understands that some parts can be developed cost-effectively by another company. Such outsourced projects are usually small in size and should be completed within a few months duration.

4. Objective-driven development v/s. Product-driven development

- Object driven development focuses on identifying the need for a new software system.
- Product-driven development focuses on producing a product based on the details provided by the client in the specification.

1.5.5 Project Charter

- It states the project objectives, project goals, roles and responsibilities.
- It lists out the reasons for undertaking the project.
- It provides solutions to the problem in hand.
- It identifies the main stakeholders and the authority of a project manager.
- This document is required by Initiative for Policy Dialogue (IPD) and Customer Relationship Management (CRM).

Benefits of Project Charter

- It improves customer relationships.
- It improves project management processes.
- Improves Regional and headquarter communications.
- Helps in gaining project sponsorship.
- It recognizes senior management roles and authorities.
- Allows progression, which is aimed at attaining industry best practices.

Elements in Project Charter

Project charter is a project planning tool that address the following key elements:

- Identity of the project.
- Time : Start and end date for the project.
- People involved in the project.
- Project objectives and set targets.
- The Business case.
- Detailed description of a problem.
- The ROI expected from the project.
- Performance of the project.
- Roles and responsibilities of the participants involved.
- List of resources needed to achieve the objectives.
- Barriers and the risks involved with the project.
- An effective communication plan.

1.5.6 Stakeholders

- These are the people who are interested in the project.
- Stakeholders can be categorized as :
 - Internal to the project team: project managers, technical managers, team leaders and developers.
 - External to the project team but within the same organization : Company owner, share holders and other employees.
 - External to both the project team and the organization: government, military, customers, third-party vendors, competitors.

1.5.7 Setting Objectives

- Stakeholders are responsible for setting the objectives of the project.
- The objectives define what the project team must achieve for project success.
- The objective for software developers could be to keep the development costs within a certain budget.
- The objectives should be SMART i.e. specific, measurable, achievable, relevancy and time constrained.

1.5.8 Business Case

Q. Define business case and explain the concept of business case.

Oct.22 (In-Sem), 5 Marks

Business case states the reasons to carry out a project charter. It states the benefits that the customer may gain by carrying building a project. Elements of a good business case are :

- The reasons of undertaking the project.
- The benefits gained from undertaking the project.

- The consequences of not building the project.
- The factors that conclude that the proposed project fits the business goals.
 - Development costs should be within a certain budget. It should not be increased.
 - Features of the system should not be reduced without consulting the customer (client)
 - Delivery date of the project should not be delayed.

1.5.9 Project Success and Failure

Factors that make a project successful :

- On time delivery
- Set of completed features
- Reliable
- Performance
- Meets expectations
- On budget
- Maintainable and enhanceable
- Around 80-85% of software fail.

Reasons for Software project failure :

- Insufficient planning : lack of a structured plan
- Unrealistic expectations
- Insufficient risk management
- Poor communication between the stakeholders (managers, developers, testers, marketing, sales, customers)
- Requirement creep : frequent change in the requirements
- Ambiguous requirement specification : misunderstanding of requirements
- Gold plating of the requirements
- Poor understanding of the goals
- Complexity of the product
- Switching the tools in middle of the project
- Changes in the budget and priorities
- Doing something without customer's feedback
- Market competition

1.6 Four P's of Project Management

The Four 'P's of Effective Project Management :

1. **People** : People are involved in the process of Recruitment, Selection, Performance management, Training, Organization, work Design, and team/culture development.

There are 5 different types of people who are involved in project management :

- **Senior manager** : Defines the business issues of the project.
- **Project manager** : Involves in planning, motivating, organizing and controlling the practitioners.
- **Practitioners** : Deliver the technical skills in building a product.
- **Customers** : Specifies the software requirements for the product being developed.
- **End-users** : Interacts with the developed software product.

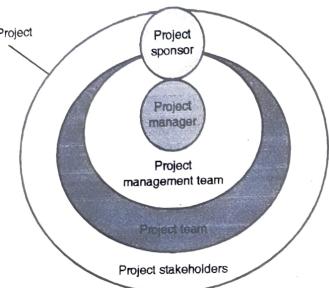


Fig. 1.6.1 : Relationship between Stakeholders and Project

2. **Product** : To develop a project plan, the problem to be solved should be decomposed. A project scope should be clear, unambiguous and understandable at the management and technical levels. The planning of a software project begins with :
 - (a) Establishing product objectives and scope.
 - (b) Identify technical and management constraints.
 - (c) Using the above information, reasonable cost, project schedule and risk involved can be defined.
3. **Process** : To develop the software, it is necessary to select an appropriate process model or combination of the models among the different process models available i.e. Waterfall model, iterative waterfall model, prototyping model, RAD model, and spiral model.
4. **Project** : A project is a temporary endeavor undertaken to produce a unique product or service. A project is a unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective that conforms to specific requirements, including the constraints of time, cost, and resources. Projects differ from operations, such as manufacturing, in that operations are ongoing and repetitive, while projects are temporary and unique. A successful project is a step-by-step sequence followed where accurate decisions are to be taken. Managing Successful software projects needs to prevent and avoid the risks/problems involved.

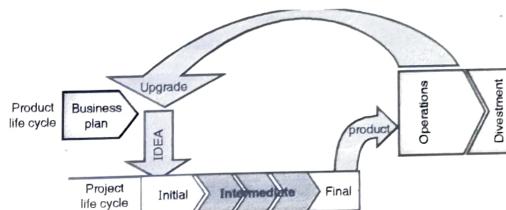


Fig. 1.6.2 : Relationship between Product and Project Life Cycle

1.7 Management Control and Knowledge Areas

- Management control is about setting the performance standards and continuously evaluating the performance of the project against these predetermined standards.
- This comparison is done in order to ensure that the performance is in-line with the standards set otherwise, take remedial actions to improve the performance.
- Knowledge areas describe the key elements that a project manager must focus on.

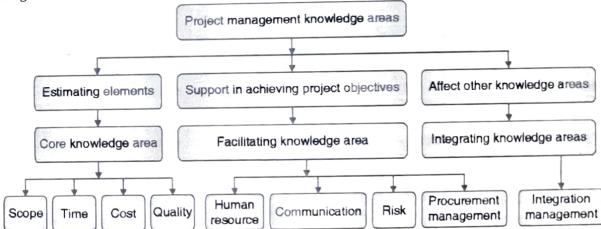


Fig. 1.7.1 : Project Management Knowledge Areas

1. Scope Management :

- It describes what the project is supposed to accomplish and the estimation of time and money that is available to achieve these objectives.
 - It describes how requirements, details and processes are managed.
 - Changes to the scope should be handled in a structured, procedural, and controlled manner. Any change to the scope of the project has a matching change in estimation.
- Example :** If the project scope is to train 100 users with a budget of Rs. 50, 000 the project manager is expected to do that. But, if the scope is changed to train 150 users, the project manager must do the appropriate changes in the budget estimation. If the budget is not adjusted, then the project manager will avoid the change in scope.
- The project scope must be communicated very clearly to all stakeholders.

2. Time management :

- This process ensures that the project is completed in estimated schedule.
- This process manages the resources, activities, schedule management.
- It defines and sequences the activities; estimates the duration and resources needed for accomplishing each activity.
- Initially schedule is referred to as the time **baseline** of the project. It is later used to compare updated baselines with the original baseline.
- Special softwares are used to build and maintain the schedule and baselines.

3. Cost management :

- This process manages the cost and overall budget estimation. After the cost of the project is estimated, the project manager controls the cost and makes required changes to the budget.
- The Project Cost depends on the cost estimated for each activity in the project. The estimation often changes as the project progresses.
Example : Initially project the cost is more difficult. Later in the project when the scope and the schedule has been defined in detail manner it is easy to find.
- Every year the project manager develops a full and comprehensive budget for the project for three annual periods. Later that budget is approved by donors, the project committee and trustees.
- The project manager must allocate monthly expenses so that the financial statements can be processed every month.
- The project manager must submit a monthly report to the committee chairperson that gives a comparison the annual budget to the monthly expenses.
- The project manager then reports to the team members about the agreed balanced scorecard format.

4. Quality management :

- This process ensures quality control and assurance by focusing on the project meets its requirements i.e. it does what it is intended to do. The quality control ensures that the outputs conform to the quality standard; whereas, the quality assurance focuses on the quality process improvement.
- This process measures the outputs of different processes against some predetermined acceptable measure.
- The project manager creates a quality management plan early in the project development because decisions made about quality can have a significant impact on other decisions about scope, time, cost and risk.

5. Human resource management :

- This process focuses on HR planning like roles and responsibilities, project organization, and staff management.
- It involves assigning staff, assessing and managing the performance of project team members.
- Project manager manages the persons of Business Support Project, project committees, beneficiary committees, trustees, donors and volunteers.

6. Communication management :

- This process decides what information is needed, how that information will be sent and managed, and how project performance must be reported.
- This process focuses on properly communicating the project's stakeholders about the entire project.
- Communication is a proactive and thorough mixture of formal and informal, written and verbal information.
- The project manager communicates the project information accurately in a timely manner to all the stakeholders.
- This process focuses on creating a communications plan which describes the kind of information (for eg. The project performance) that should be communicated on a regular basis to all those who should receive it.

7. Risk management :

- This process designs a plan describing how to handle risks in the project - identifying risks, and how to respond to these identified risks.
- Risks arise due to uncertain events and may affect the project for good or for bad.
- Assessing of risks includes - how likely will the risks happen, how it will affect the project, and what will be the cost if it arises ?
- The project manager uses risk analysis tools and techniques to assess the risks and answer the questions.

8. Procurement management :

- It focuses on how to obtain goods or services from an outside organization.
- The project manager plans for purchasing and acquisition of products and services that can't be provided by own organization.
- The plan includes preparation of procurement documents, request to vendor responses, selection of the vendors, and creating and administering contracts with each vendor.

9. Integration management :

- This process coordinates the other 8 knowledge management areas to work together throughout the project.
- It focuses on the big tasks that must be done for the project to work. Every part of the project is coordinated.
- When the project starts, the project plan is assembled and executed, the work is monitored and verification of the results of the work is performed, and also performs the tasks associated with closing the project.
- This area involves the management and control of the entire project.

1.8 Project Management Life Cycle

- The project life cycle describes the tasks that must be completed to produce a product or service.
- The project manager needs to be aware of how the inputs and outputs of one lifecycle affect and shape them.

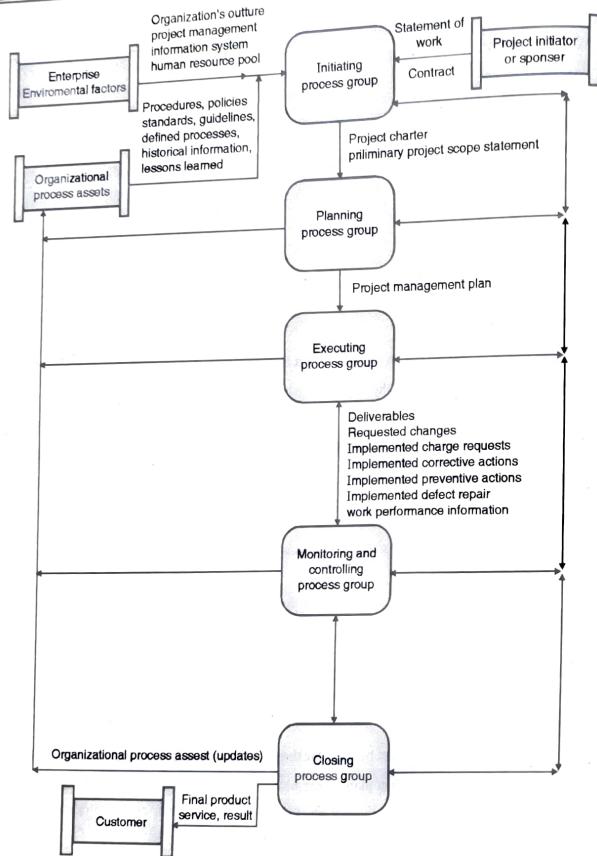


Fig. 1.8.1 : Project management life cycle

As no two projects are exactly alike, all projects should progress through different phases.

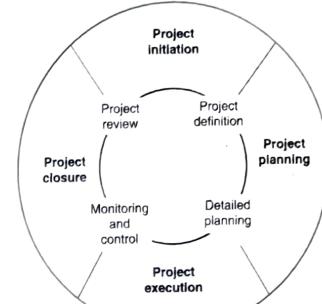


Fig. 1.8.2 : PMLC phases

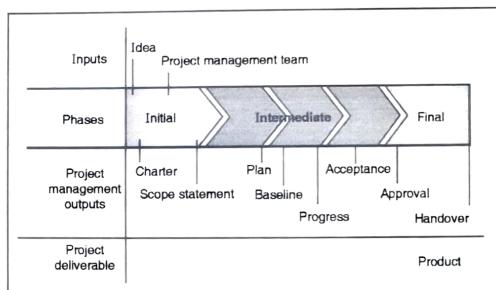


Fig. 1.8.3 : Typical sequence of phases in project life cycle

1. Propose the project :

- When an individual wants to create a product or develop a service that can solve a problem or address a need of his organization, then he proposes for a project.
- Organization then submits the proposal for evaluation and selection process. If the proposal is selected, a budget or further management commitment for the project may be required. Then a project manager is assigned and the project is authorized to progress for project initiation.
- Tasks performed under this phase are:
 - Develop business case, Develop proposed solution.
 - The proposed solution will be input to the next phase i.e. Project Initiation.

3 Project initiation:

- Initially a project manager is assigned. Then the project manager works with project sponsor to identify necessary resources and team members. Then they find the key project parameters – cost, scope, schedule and quality (CSSQ). The project team prepares a document called project proposal, which includes initial business case. If the project sponsor approves this, then the designated team begins the initial planning effort. Project Plan also involves and communicates with all the parties to identify foreseeable risks that can threaten the project.
 - At the end of this phase, business case is revised and reevaluated and a decision is made to either halt the project or proceed to project planning. The output of this phase will be approved project proposal, which is input to the next phase.

Tasks performed under this phase are :

- i) Identify sponsor.
 - ii) Identify project team.
 - iii) Review historical information.
 - iv) Develop project proposal.
 - v) Conduct kickoff meeting.
 - vi) Establish project repository.

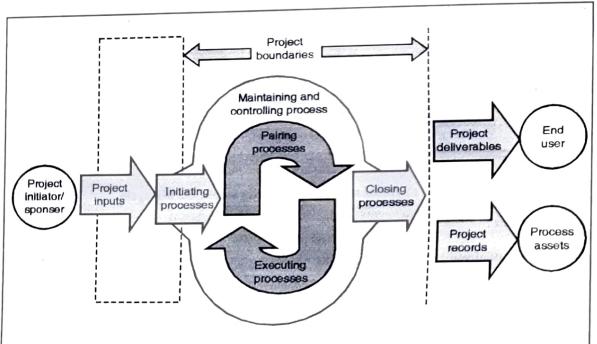


Fig. 1.8.4 : Initiating Project Boundaries

3. Project planning :

- It conducts kickoff planning. Project planning builds on work done in project initiation, refining and improving Cost, Scope, Schedule and Quality and project deliverables.

- Mostly extra members join project team and they assist project manager in further elaborating key elements like change control, acceptance management, issue management, organization change management and project transition are added to project plan including project specification items.
 - Project planning marks completion of project plan. Lastly business case is revised and reevaluated based on completed planning documents. Finally decision is made again either to halt the project or to proceed further for project execution and control.

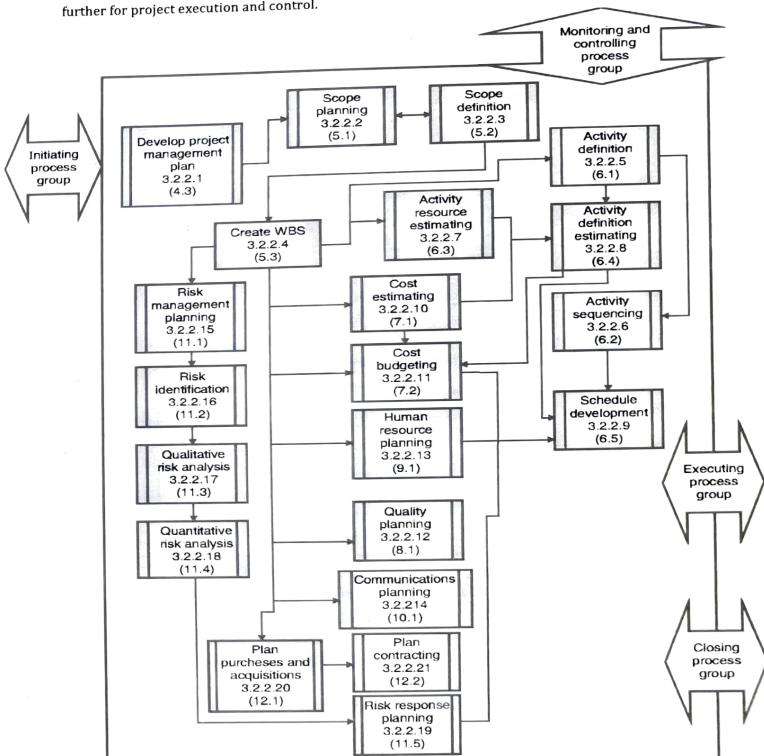


Fig. 1.8.5 : Planning process group

- Tasks performed under this phase are :
 - Orient new team members.
 - Review project material.
 - Kickoff project planning.

4. Project execution and control :

Conducts phase kickoff. Most of the resources are applied/expanded on the project. Initially lots of team members are recruited into the project. The primary task of project manager is to allot the team members to execute the tasks on defined project schedule and develop the product or service the project is expected to deliver. Project manager uses processes and plans prepared during earlier phases.

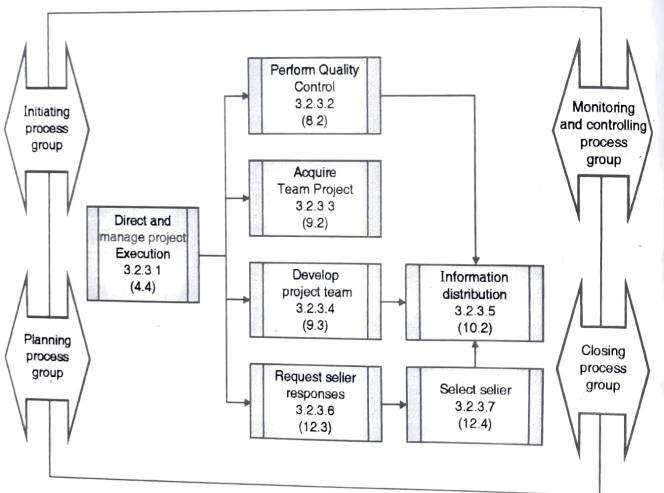


Fig. 1.8.6 : Executing process group

- Tasks performed under this phase are :
 - Orient new team members.
 - Review project materials.
 - Kickoff project execution.

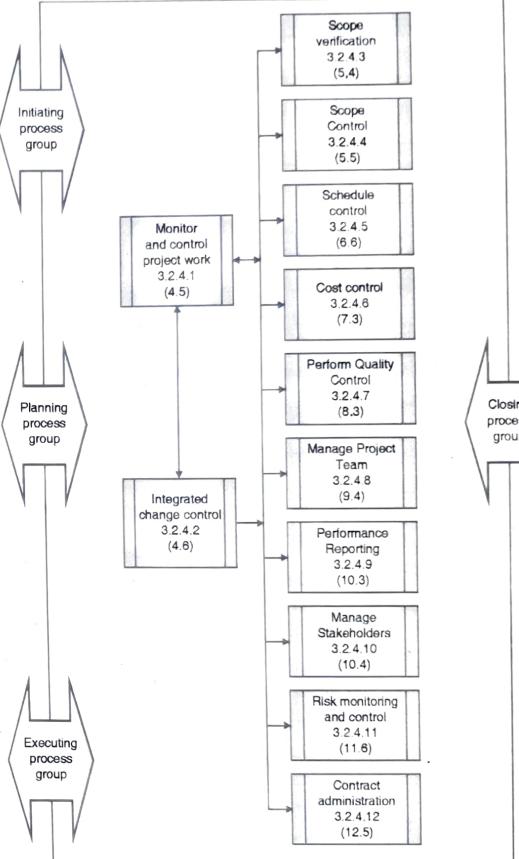


Fig. 1.8.7 : Monitoring and controlling process group

5. Project closure :

Conducts post implementation review. The Project team assesses the outcome of project as well as performance of team and the organization. This is done by feedback evaluation from customers, team members, consumers and other stakeholders. The Review documents the best practices and these lessons can be used for future projects. Project metrics captured are used to compare and evaluate performance measurements.

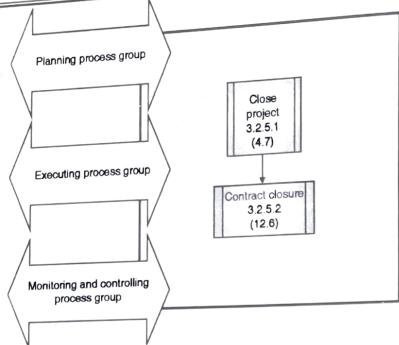


Fig. 1.8.8 : Closing Process Group

- Tasks performed under this phase are :

 - i) Solicit feedback.
 - ii) Conduct project assessment.
 - iii) Prepare post implementation report.

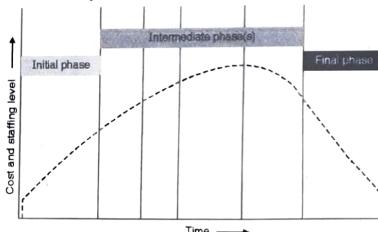


Fig. 1.8.9 : Typical project cost and staffing level in project management life cycle

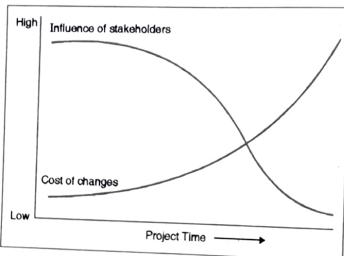


Fig. 1.8.10 : Stakeholder's influence on project over time

1.9 Traditional v/s. Modern Project Management Practices

Q. Explain traditional project management and modern project management. Oct.22 (In-Sem). 5 Marks

- Regardless of the type of the project, size of the activities or effort, every project requires project management.
- There are two main types of project management :
 - o Traditional Project management is a set of orthodox methods and techniques that can be applied to an activity seeking an end product, outcome or a service.
 - o Modern Project management Agile and Scrum are two such modern project management methods.

Example :

- Consider a company where in each of its staff uses the same old OS i.e. Windows XP. And now, the management decides on upgrading the OS to enhance the productivity and reduce the OS security threats.
- If you have one office with about 100 computers, it is considered as a medium scale project. In case if your company has 10-15 branches, then the project is a large scale one with high complexity. In such case, you are over-burdened by the tasks at hand.
- This is where traditional project management comes in. Traditional project management does not require any customizations and also modern project management methods are not required in this case.
- The company can use an existing project manager to manage the OS upgrade project. He will plan the entire project, derive a schedule, and indicate the required resources.
- The cost will be elaborated to the higher management. There will be frequent updates coming from the project manager to all stakeholders.

Multiple Choice Questions

Q.1 What is project management ?

- The planning, organizing, monitoring, and controlling of all aspects of the project in a continuous process in order to achieve its objectives.
- The planning and application of business and financial models used to control all aspects of the project for the purpose of meeting project objectives.
- The application of knowledge, skills, tools, and techniques to project activities for the purpose of meeting or exceeding stakeholder objectives.
- Both A and C.

Q.2 A project is a temporary endeavor undertaken to produce a unique product or service.

- True
- False

Q.3 What are characteristics of a subproject ?

- A set of work units assigned to a single project organizational unit to divide the project into more manageable components.
- A piece of ongoing administrative work
- A temporary endeavor undertaken to produce a unique product or service.
- Both A and C.