

CONSTRUCTION PLANNING AND SCHEDULING

COTM4221

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Chapter One

Introduction to Project Planning



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Introduction



Project:

It's a temporary group activity designed to produce a unique product, service or result.

Characteristics of construction project:

- 1. Objective: unique**
- 2. Time: a defined starting and ending date**
- 3. Resource: the 4M's**
 - ✓ **Money**
 - ✓ **Material**
 - ✓ **Manpower**
 - ✓ **Machine**



Management



It can be said that there are as many definitions of management as there are managers. Some definitions include:

- ✓ *Mgt is a means of achieving **political, economical and social** objectives.*
- ✓ *Mgt is a means of **integrating organizational resources**(Physical, Financial, Human, IT, etc) to achieve organizational objectives **efficiently and effectively** .*
- ✓ *A means of getting things done through others to achieve goals.*

Management cont....

- ✓ *Mgt is a process of **planning, organizing, directing, staffing, and controlling** of organizational activities to achieve objectives.*
- ✓ ***(Integrative definition)** Management involves a set of activities including planning and decision making, organizing, staffing, leading, and controlling directed at organizational resource(human, financial, physical and informational) with the aim of achieving organizational goal in an efficient and effective way.*

Functions of Management (What managers do?)





Functions of Mgt cont....



- The functions of management uniquely describe **managers' jobs**. The most commonly cited functions of management are **planning, organizing, staffing, leading, and controlling**.
- **Henri Fayol** was the first person to identify elements or functions of management in his classic 1916 book **Administration Industrielle et Generale**.



Project Management



“Project management, is the application of **knowledge, skills and techniques** to execute projects **effectively and efficiently**”
Project Management Institute – PMI

“Project management is the discipline of **planning**, organizing, securing and managing resources to bring about the successful completion” *Wikipedia*



Planning

Setting the organization's **goals** and deciding how best to **achieve** them. A manager cannot operate effectively unless he or she has long range plans.

A plan helps to determine:

- What is to be done? *Scope/Quality Planning*
- When is it to be done? *Time Planning*
- How will it be done? *Resource...Planning*
- How much it costs? *Cost Planning*



Planning....

- **Planning** involves the **logical analysis** of the project, its **requirements**, and the **plan** for its execution.
- This will also include the consideration of the existing **constraints** and available **resources** which will affect the execution of the project.



Planning Processes: Output



- ✓ **Scope plan:** All the works required to achieve objective.
Build Methods, WBS, etc
- ✓ **Quality plan:** quality standards, specifications, manuals, etc to ensure quality.
- ✓ **Time plan:** Schedules showing the time frames for the execution of each activity in such a way that the project satisfies the projects constraint of time
- ✓ **Resource plan:** resources required for the execution of the project in terms of type, amount, time frame needed as well as when/how the deployments needs to be done.



Planning Processes: Output



- ✓ **Procurement plan:** clear indications as to buy or make options, how procurements are need to be made and when they need to be made
- ✓ **Risk management plan:** All potential risks and possible way of managing them
- ✓ **Cost plan:** Cash flow Vs Income statements



TYPE OF PROJECT PLANS



- ✓ **Time Plan**
- ✓ **Resources Plan**
 - **Manpower Plan**
 - **Material Plan**
 - **Equipment Plan**
 - **Finance Plan**



Time plan



- ✓ **Time** is the core of all construction projects, and contracts often have clauses outlining awards (bonus payments) or penalties (as liquidated damages) for completing a work ahead or later than a scheduled date.
- ✓ **some of the common reasons for delays**
 - Default in planning
 - Delay in award of contract,
 - Changes during execution,
 - Alterations in scope of work,
 - Delay in payments,
 - Slow decision making,
 - Delay in supply of drawings and materials and
 - Force majeure



Time plan...



- ✓ Several reasonably well-established techniques for time planning are available
- ✓ Most commonly used scheduling techniques are,
 - Bar/Gantt Chart
 - Critical path method (CPM),
 - Program evaluation and review technique (PERT),
 - Line of balance technique (LOB),
 - Linear program chart (LPC) ...
- ✓ The choice of the method to be used in a particular case depends on the **intended objective, nature of the project, target audience, etc.**



Time planning process



- ✓ The time planning process involves the following three stages;
- (a) **Project work breakdown** → this means breaking down the scope of project work into its constitute sub-projects, tasks, work packages and activities.
- (b) **Modeling and analyzing networks** → this include developing logic diagrams or sub-networks; integrating these to develop a time-planning model(Usually a network), and; analyzing this model to determine the project completion time.
- (c) **Scheduling work programme** → this involves putting the time plan on a calendar basis, and using the scheduled programme to forecast inputs and out puts.



Resources plan

- ✓ a resource plan, combines **manpower, materials, equipment, budget or cash flow**, is also drawn up for a project to show the overall requirement of the different resources in the project.
- ✓ Such a plan can be prepared only on the basis of the schedule of a project.
- ✓ In a manner of speaking, the relationship between planning for **time** and **resource** is similar to the relationship between design and analysis of a structure.



Manpower plan



- ✓ **This plan focuses on**
 - **estimating the size of work force,**
 - **scheduling the deployment of manpower.**
 - **establishing labor productivity standards,**
 - **providing suitable environment and financial incentives for optimum productivity, and**
 - **grouping the manpower in suitable functional team in order to get the optimum utilization.**



Material plan



- ✓ **The material plan involves**
 - **identifying the materials required,**
 - **estimating quantities,**
 - **defining specifications, forecasting requirements,**
 - **locating sources for procurement,**
 - **designing materials inventory, and**
 - **developing the procurement plan to ensure a smooth flow of materials till the connected construction works are completed at the project site.**



Equipment plan



- ✓ **The material plan involves**
 - ✓ **identifying the construction tasks to be undertaken by mechanical equipment,**
 - ✓ **assessing the equipment required , the amount and there productivity,**
 - ✓ **exploring the equipment procurement options and, finally,**
 - ✓ **participating in the decision-making for selecting the equipment**



Finance plan



- ✓ **large construction projects require huge investments, and a long time to complete,**
- ✓ **it is obvious that all the money is not required at any one point in time.**
- ✓ **The standard cost technique finds wide applications in estimating, forecasting, budgeting, accounting and controlling costs.**

Thank You !