Construction and Project Management

Lecture 1

Introduction

A project is nothing, but a set of activities. For example, when you take a brick and keep it down, it is an activity, and construction of a house is a project. So, a group of activities together constitute a project. The construction of a house consists of many activities like digging of foundation pits, construction of foundation, walls, roof, fixing of doors and windows, fixing of sanitary fittings, wiring and finally interior works.

So, each project is unique as the activities of a project are unique on its own and non-routine.

MANAGEMENT

What is management? Management is

- Planning
- Organizing
- Directing and Controlling of the 6 Ms

The 6 Ms are Men (that is the manpower used in a particular project. For the construction of a house, say, we involve engineers, architects, masons, clients, investors, etc.), Material (i.e. what the building consumes on its own like mortar, cement, brick, steel, concrete, etc.), Machinery (cranes, excavators, etc.), Money, time (time is nothing, but Minutes) and Marketing (in the case of real estate projects, they need to market it for selling). We need to first do the planning like how we are going to execute the project, organizing is how we are going to bring all these in a single place and sell it to our customers by doing it efficiently and in a timely manner. Directing and Controlling is nothing, but directing all the 6 Ms towards a single goal.

So, Management is a social process involving the coordination of Human, Financial and Material resources through the functions of PODC -- Planning, Organizing, Directing and Controlling -- in order to achieve the stated objectives and goals efficiently and effectively.

Project Management:

Project management is nothing, but a set of principles, methods, and techniques used to plan and control a project work effectively. Management is Planning, Organizing, Directing and Controlling the 6 Ms.

Project manager is a person who manages the specific project to which he is assigned in an efficient manner with the given resources and within the given schedule and cost.

WHY DO WE NEED PROJECT MANAGEMENT AND WHY, AS AN ARCHITECT, DO YOU REQUIRE PROJECT MANAGEMENT?

- Today, everybody is moving from traditional hierarchy usage to modernization, expecting higher, superior quality and faster results and these can be achieved through project management. Repetition of tasks is also disappearing and each project is unique and each real estate project has its own unique selling point. A neighbouring apartment has its own different character and that is where a project manager needs to make his presence felt and do the project efficiently.

  What all project management does? Project management, on its own, has 9 areas, which we call as **knowledge areas.** Let's see all of these in detail one by one.

1. Project Integration Management:

It is the bringing together or amalgamation of all resources to be directed towards a single goal of achieving project completion in the desired manner and in the desired level.

2. Project scope Management:

It is scope identification of the project like what are all the things you want to work on in the project and what all you need to do for the project like building a high rise apartment or a villa or a row-house or go in for plotted development. For that, we need to do feasibility studies and research the market.

3. Time Management:

It deals with the timeframe within which you have to complete the project. Suppose you have 60 months and you need to do a plotted development, it doesn't require that much time as we have to develop only the infrastructure. That is why you have to sequence the activities. First, you need to define the scope, then you need to define the activities like what all am going to do in this particular project and then sequence it properly and give all activities a specific duration and see to it that everything is achieved within the timeframe.

4. Project Cost Management:

Cost control is to control and maintain the budget fixed for every project, which will definitely vary from the time we assign it to the completion stage.

5. Project Quality Management:

Quality management is like quality assurance. Any project has to be done in a stipulated quality level and that needs to be assured with the help of project management.

6. Project Human Resource Management:

HR management is nothing, but the resources or manpower deployed for a particular project, the project requirements, their specific roles in the project and what is the team I am going to form for the project so that the team will move forward the project to its desired goal.

7. Project Communication Management

Communication management deals with the information that I need to know about the project, the amount of information each member of this project need to know, the protocol in which they need to know this information and the protocol in which I need to address this communication.

- ☐ Communications Planning – that is protocol assigning

- ☐ Dissemination of Information - who should know what information at what time and at which level. (For eg, a site engineer need not know your budgeting and likewise, confidential matters need not be shared with every team member as only the top management should know about it.)
- ☐ Progress Reporting – It is the reporting to the management or higher officials or to the client about the daily activities happening in the project, weekly happenings, etc. So, there is a reporting structure and the top management knows that this is how the project is moving and about delays so that they can plan the resources like cost and time accordingly and inform the clients. Administrative Closure is who should know what information at what time and at which level.

8. Project Risk Management:

Every project has a certain amount of risk involved. Before starting any project, we should first anticipate the risks involved like legal issues, construction risks or unknown risks, identify them and analyze if the risk is really a threat or just a risk that can be avoided and plan the risk response if the risks hit my project during execution.

9. Project Procurement Management:

Procurement Management comes in when we get material or manpower from outside resources. Let's say we have daily labourers working in our own company, but apart from that, if we need to hire more manpower, we approach a contractor or somebody who gets the manpower, or electrical vendors or plumbing vendors. That is a kind of procurement like material procurement. For procurement management, we should first plan the process and divide the project into packages like civil structures, electrical works, plumbing works, AC works, fire fighting works and finishing works for a residential project and each package is tendered out. You should select the source, i.e. the vendors or contractors having expertise in that particular field, and call out for tender. The tendering process happens and the contract is awarded to a particular vendor (contract closure) so that he becomes a part of the project.

Project Classification

TYPES OF PROJECTS:

We have been talking about a project, project management and project management areas. What are the types of projects? Projects are strictly divided into four types --

- Civil Engineering projects
- IT Projects
- Manufacturing Projects
- Projects of pure scientific research.

1. **Civil Engineering projects:**

Residential projects, infrastructure projects, tunneling, bridges, mining, oil and gas projects come under civil engineering.

2. **Manufacturing Projects:**

All your equipment and electronic goods come under manufacturing projects.

3. **IT Projects:**

IT is software, which is nothing but management of change. When you adapt from one form to a new form, i.e. when there is a transmission in the IT sector, that is when the management of change happens and that is where you require IT projects.

4. Projects of pure scientific research:

R & D projects come under this division.

We will mainly concentrate on civil engineering projects in this particular presentation. Civil engineering projects can be further classified in a lot of ways.

Nature of facility: Whether it's a building (residential or commercial), or infrastructure project like roads, bridges, tunnels, or industrial project like factories, or a special purpose construction project like special economic zones (SEZs) that are developed for a specific reason.

Nature of work: Whether the projects are repetitive or non-repetitive. For instance, some large real estate giants build towers of similar nature and keep repeating the

same project everywhere, irrespective of the location, while non-repetitive projects are site related.

Mode of execution: Whether departmental or contractual. Contractual is what we saw in procurement management, where we award the project to an individual expert. Departmental is where a single owner has various departments, which come together for the project's execution.

Mode of contract: This is again a contractual terms of classification. Cost plus is executing the work for an additional payment. For example, I execute the work for Rs 100, but you give me Rs 110. Item rate is nothing, but you have a bill of quantities (BOQ) for this particular project, which I will be working on, and whatever is the item being consumed you pay in this rate of BOQ. Lump sum is when payment is done in a bulk amount for work done on a particular project and that amount will be given in various percentages in different stages of the project. Turnkey project is one in which a single project owner (i.e. client) sub-contracts the whole project to another client, who will be the turnkey contractor, and he will be solely responsible for the design and execution of the project, besides completing and handing over the project to the client. Build, Operate and Transfer (BOT) kind is mostly seen in Government projects. For example, road contractors or road contracting companies build roads, operate it by collecting tolls for usage and transfer it to the Government once they break even or after 5-10 years.

On time basis:

- Long duration
- Medium duration
- Short duration
- Special short term duration

On value basis (in crores):

- Mega value (over 10000)
- Large value (1000-10000)
- Medium value (100-1000)
- Small value (<100)

Maturity level: It deals with the risks involved in the particular project.

Insignificant risk: When there is almost no risk when we have the design, BOQ and specification, we can just execute the project.

Low value risk: This is where the requirements are defined like you need to construct a house, but the details are not clear. There is little amount of risk involved here, but nothing great.

Medium value risk: Medium risk is where the requirements are defined, but the details like what and how to build, and how many storeys are unknown.

High value risk: R&D projects fall under this category as you do not know when you will achieve the end result.

Need based projects: Public need projects are nothing, but roads, bridges, etc. Corporate needs are like IT buildings and Commercial needs are like shopping malls.

Re-engineering projects are those where we re-engineer or re-build a house or office.

PROJECT MANAGEMENT FUNCTIONS:

What is a project management function? The overall aim of the management in any enterprise is to facilitate the accomplishment of its objectives. In doing this, the management has to perform certain functions, namely

- Planning
- Organizing (structural relationship)
- Directing (Influencing)
- Controlling (monitoring)

As we saw earlier, project management is planning, organizing, directing and controlling. Planning is what are the activities involved in this particular project, organizing is how to structure those activities, directing is how all these activities are arranged in a single line so that we reach the goal and controlling is how we manage the 6 Ms in the process of reaching the goal.

CHARACTERISTICS OF A PROJECT:

- Purpose
- Project life cycle
- Interdependencies
- Uniqueness
- Conflict

All the projects have a purpose. Project life cycle will be dealt with in detail in sometime. Interdependencies - each project is interdependent. For example, a housing project depends on the rules and regulations of the particular city. Uniqueness - each project is unique as your house and your neighbor's house are never the same. Conflict is the risk involved in the project.

When we come to Project life cycle, it is not just about the construction activity. It also includes the pre-construction stage like site selection, feasibility studies and designing of the project, the construction phase where we execute the project with men and material and then comes the post-construction phase of maintenance works.

- A collection of generally sequential project phases whose name and number are determined by the needs of the organizations.

So, you can have 'n' number of life cycles in a project and these three are the basic classifications, i.e. the pre-construction stage, construction stage and post-construction stage.

Participants in construction:

- Business promoters like Government bodies, real estate agencies, industrial development and similar agencies.
- Architects, engineers and associates involved in the designing stage.
- Manpower recruitment and training agencies which train right from the labour to staff.
- Banking and finance institutions which lend money
- Risk insurance and legal services - Risk insurance people cover the risk of the project as well as the manpower working on it and legal bodies govern the legalities of the project.

Phases of Project Management: Any project has six phases to it.

- Initiation phase is the idea to take up a project.
- Definition phase is defining the kind of project to be taken up like commercial or residential project. A decision is taken based on the feasibility of the area. For instance, if I do a commercial project here, it will fetch good income as we have colleges, residential areas and industrial areas nearby.
- Design Phase: How many floors are needed and what facilities should be included in this commercial complex, etc.
- Development phase: Then comes the site mapping and designing of the project.
- Implementation phase is nothing, but the actual construction of the project.
- Follow –up stage is the maintenance of the project. Each individual contractor will pay an annual maintenance amount. For a shopping mall to be operational for a longer time, follow–up stage is needed and it is more important than the implementation phase.

Decision Making

Now, let us see what caters to the success or failure of a project. The success of any project depends upon:

- Project Sponsorship at executive level – Who is going to fund the project? Without funds, no project can be done.
- Good project charter - the project should have good value in the market and also good social character.
- Strong project management - the nine areas of project management should be sound and it should be done towards the common goal.
- The right mix of team players – The team players have to be efficient and all the team members should work towards the goal.
- Good decision making structure - decision making is more important in any organization
- Good communication – the communication protocol should be maintained in a good manner
- Team members working towards common goals – As I said earlier, the team members should work towards a common goal.

WHY PROJECTS FAIL?

A project fails because there is no proper alignment of the objectives, no scope for the project, feasibility studies are not done properly, no organizational clarity and unrealistic expectations. You expect a particular area to grow in five years and start the project and complete it in 5 years, but it doesn't turn up the way you expected. Lack of executive sponsorship (there is no particular sponsorship for this project), lack of project management (even if any one of the nine project management areas fail, the project is a failure), inability to move beyond individual and personality conflicts, and politics both within the organization as well as outside are the other reasons.

As many as 56% of the projects have failed due to cost overruns and 49% projects faced time overrun from 1 to 157 months. You estimate a budget and work on it, but despite tracking and controlling, cost overruns happen. Likewise, you expect the project to get over in 60 months, but it goes on till 120 months. This will

severely affect your prospects of breaking even by getting back the amount invested in the project and hence the project fails.

The factors contributing to these overruns are:

1. Inadequate project formulation

2. Poor planning for implementation

3. Lack of proper contract planning & management

4. Lack of project management during execution

DECISION MAKING: What is decision making and why is it important in project management? It is the process of judgment for implementation, after taking into consideration the facts, feelings, opinions and circumstances of an issue related to an individual/group/organization.

When an issue crops up, you need to analyze the facts, consider the feelings of the persons involved, take the opinions of everyone there and check the circumstances for the issue cropping up, and relate it to your organization or the individual or the group of members involved in the issue, before giving a judgment.

The Best way of Making a Decision

Consultative and Participative way of making a decision - no person is to make a decision individually in an organization, he needs to consult a group of members or he should decide collectively with his team members. This is the healthy way of decision making.

Decision making is a Collective Responsibility

Individual ability without collective responsibility is a liability to the organization, i.e. you need to take your decision individually, but it should be the outcome of the collective responsibilities of your team members after discussion.

Risk of not making a decision - Not making a decision is a very big risk, because if you have an issue pending for a long time, that will become a huge threat to the organization. If the risk is small, it can be warded off, but when the threat is big, it cannot be avoided. So, the risk of not making a decision is probably greater than the risk of making a decision. Some decision has to be made as keeping an issue open and unattended is a greater threat to the organization.

3 ABILITIES FOR ACHIEVEMENTS:

- Ability to Make a Decision
- Ability to Implement the Decision
- Ability to follow up till the desired results are achieved

Suppose, you make a decision that all employees will work till 6 pm as you observe them leaving by 5 or 5.30, thus affecting man hours, and issue circulars to this effect for implementation. If it is not fruitful despite staying back till 6 pm, you do a follow up and ensure that they work till 6 pm.

HOW TO MAKE A DECISION:

As we saw in the definition of decision making, we need to get the facts, feelings, opinions and also study the circumstances.

- Get the Facts – Getting the facts means reviewing the records, history, experience and the rules and customs that apply.
- Get opinions and feelings of the people involved or working in this particular issue.
- Weigh the Facts - You need to analyze the situation and not jump to a conclusion after hearing the facts.
- Take an Action - you need to handle this yourself and if you need any help, you should ask your team members and then give the desired solution.

HOW TO GET OPINIONS AND FEELINGS:

You should not argue with your team members to make them know what you are thinking. That way, you cannot get the opinions and feelings of others. You need to encourage people to talk and make them feel that what they are saying is important for making a decision. You should not interrupt when any issue is being raised. You should not do all the talking yourself**,** but make the other person to talk.

BEST PRACTICES FOR EFFECTIVE DECISION MAKING:

- You should be positive in your thinking
- You should be focusing on your company’s vision, mission and values. Vision is what your company has desired to achieve, mission is how they are going to achieve and values are what they will get back.
- You should be Participative & Consultative

- You should be patiently listening and tactful
- You should prioritize your selection
- It should be a win-win situation
- It should be creative and innovative.