

Project Management: Planning, Execution, Evaluation And Control

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Welcome to the course Project Management Planning, Execution, Evolution and Control. I am Professor Sanjeev Choudhury from Indian Institute of Technology Kharagpur. Today, we will be starting the module 4. Module 4 is defining the project. In the first lecture of module 4, we will cover project scope of work and deliverables. So, coming to the initial slide that is the concepts that will be covered in this lecture are defining the project scope, then establishing project priorities, then creating the work breakdown structure.

Thereafter, in the next class we will be covering the rest of the topics of this module. So, we will go for the first defining the project scope. To start with step 1, step 1 is the you first have to define the project. In that what do you do? We first do the develop a project scope statement.

This is also called scope of work or scope of service. What is a scope of work or the scope statement? This is the heart of the project management for any project that it is the scope of work. It should be very specific, tangible and measurable. By definition, the scope of statement is the end result or mission of the project that is you are going to have a product or a service for your clients and these are be stated in very specific terms and it should be measurable and it should be tangible. It has been observed empirically that most of the project fails or goes to the legal or the arbitration because the scope of work of the scope statement was not very specifically mentioned.

It was whenever you put it as a very broad way, it invites different perceptions from different stakeholders. Contractor may attribute it something, then your clients will be attributing it some other thing, all these we will be discussing more. Now the again it should not be too broad the scope, it should be specific. Again, on the other hand, it should not be too rigid also because if your scope is very rigid, specifications are very narrow, what happens? You do not get enough bidders, enough vendors. As a result, you will get less than 3 bidders.

So, you will be stuck, you know legally you will be stuck. It will be difficult to give your project to the suppliers or the vendors or the subcontractors and others. So, I will show you a practical real life, a good project of scope work scope, what does it contain a bit later. Say what is the purpose of scope statement? The scope statements purpose is it clearly define the deliverables. What are the deliverables of the of your project? That has to be clearly and defined so that it is measurable, so that there is no ambiguity between the customer or the clients or the contractor and it also focuses on the project completions.

A scope statement will allow the different stakeholders to focus how to complete the project. Also, it helps the different stakeholders like the planners or the clients or the contractor to plan the project and monitor it and measure its performances. These are the purpose of the scope statement. Then there is something called project charter. What is a project charter? A project charter is in fact, the extended version of a project scope of statement.

It is much more detailed. It gives you the states the roles and responsibilities of the project manager and the project team. It also details the power of delegations, the resources to be used, activities to be done by the project manager and it also authorizes the project manager to complete the project for which the resources required and the command or the power he should will everything is in detail given in the project charter. Then another thing is we come across is the scope creep. What is a scope creep? A scope creep is suppose the project is when the scope is not very specifically mentioned and it is a bit broad, what happens over the time if the project is a longer durations over the time there is a tendency for the scope to expand that is in other words the requirements of the project in terms of performance or the specifications in terms of the budget in terms of some additional things it comes in.

So, as a result what happens? It delays the project time duration increases and also the cost increases because you are incorporating some additional performance or the specifications for the project. It has a good effect positive or negative both effects. Positive effect is by the time when you are going for the long duration project in the market in the environment some advanced technology has come in, advanced materials has come in. So, you are replacing those advanced things. For example, I can give you one example what I have seen that a company has ordered for the it is in mid-1990 in 1990s early 1990s.

So, ordered for a computer desktop computer for its offices. So, that time when they beaded it was Pentium 3 was the advanced PC available on the market, but somehow the

procedures for the procurement procedures and all it got delayed by quite a few months by that time in the market Pentium 5 has come in. So, what they did? They upgraded it to Pentium 5. So, that although the cost has gone up and all, but it is a positive thing because you are getting more updated version of the from Pentium 3 to Pentium 5. So, these are the scope creep.

In nutshell you can say that there is a tendency for the project scope to expand over time when the scope is not very specifically mentioned. So, that is called scope creep. Next the project scope has a generally a checklist that a project scope must contain few things. These are very important. It must contain a project objective.

Every scope should have a project objective in clear terms. Suppose what is your deliverable and deliverable should be say not it should be delivered not exceeding the value of say 5 million dollar and not exceeding the time of 1 year. So, this is the and what are the what you want it should be very specifically stated that is project objective. Then project scope must also contain the deliverables. What are your deliverables end results? So, end product end service it should be stated in clear terms.

This is deliverables. Then it is the then its must may contain milestone. So, if a milestone is a special or specific event a major event of a project at a point of time then there may be that technical requirements. You must specify your technical requirements as clearly as possible. Suppose if you wanted to buy a buy some person or desktop computers for your office you must technical requirement must say the or your laptop must say this your desktop or laptop must work on 120 AC current say alternating current 110 volts AC alternating current or 240-volt direct current DC current without any adapter.

This is the technical requirement. Suppose the emergency number 100 it must we wanted to procure you must tell the technical requirements are the it must identify the caller's telephone number as well as its location or the GPS these are the technical requirements. So, then there may be limits and exclusion you should specifically tell the limits and exclusion if any because the limits may be supposing you are constructing a building the building you must say it does not include landscaping or installation of safety device these are the exclusion. Also it may you may say suppose you are installing some system you will be installing system, but the training is not a part of the of this it should be in additional cost or if it the training is there the you should be very specified you it should be trained only for 10 people or 20 hours any additional thing additional numbers and all shall be paid by rupees 10000 per day. So, you should must tell these limits and exclusions otherwise if it is open ended that will call for legal or the arbitration cases.

Then reviews with customer. So, again last thing is the you have to review with your customer like the customers are your customers or the clients to consolidated or the firming up your scope statement because scope statement is always consulted or delivered to the client. So, clients and the contractor's team must work collaboratively to review it. So, these are the projects checklist these are generic in nature it is not necessary that all these all these checklists have to be there it depends on the type of the project type of the organization requirement of the clients. So, it may happen there may be some other points and it is just a generic one.

So, I wanted to show you the way good scope of work that I will show you later on if time permits. Now the after defining the project what we will be doing we will be establishing project priorities. This is step 2 that what are the causes of that for that you have to cause have a tradeoff what are the causes of trade off that every projects requirement is different. So, there may be the shift in relative importance of criteria related to cost time and performance parameter. Cost is your budget time is your schedule duration and scope are nothing, but the performance or the specification always there will be a project management trade off.

This is saying that cost is the budget time is your durations and scope is your performances and there is there is quality at the heart. So, it may happen so some project your scope or the performance specifications are of prime importance. Then what you do your tradeoff between cost and time. If time is some time you may require your time is the essence you have to complete the project in time that time what your tradeoff between the cost and the scope. If your budget is limited budget is the then you trade off the scope and the time.

So, this way I will show you the how do you manage the priorities of project trade off. So, you generally what we do there are three parameters we parameters we did categorize it as constraint enhance and accept. What is a constraint? A constraint is a parameter is a fixed requirement. It cannot be changed it is always a fixed and say this constraint may be in some project time may be a constraint somewhere your specifications may be specifications may be a constraint or somewhere the cost may be constrained. Similarly enhance, enhance is you are optimizing the criteria over others sometime that you may you may enhance or optimize the time sometime that performance may be the enhance criteria or the cost may be the enhance criteria and accept is you are not meeting the criteria.

So, you are reducing the standard of the criteria or criteria requirement. So, that is called accept. Suppose in this example it can be your reducing criteria may be the time

may be delayed if your resources are constrained then you allow time to of the project to extend or sometime your performance become the accept because when your time you cannot is fixed you cannot extend the time or cost is budget is limited then you try to reduce the performance criteria. Suppose your project is say a developing a car which will give you 25 liters a kilometers per liter, but you are for that it is your resource say cost budget is constrained and time is a constraint it has to be finished. So, then what you do you cannot meet that performance.

So, you bring out the car which gives 20 kilometer per hour. So, you are compromising with the specification. So, this way here in this picture your constraint is specification. So, here time, time your car optimizing means time you are trying to optimize or trying to improve that is the enhancing and budget the cost you are ready to ready to increase like cost may increase. So, this is a project priority matrix this way you have to establish project priorities it can be anything it suppose some a product has to become within the next 6 month that time, time becomes the constraint and cost becomes the enhancing may be the cost may reduce increase like you allowed to increase.

So, it becomes the accept and performance become the enhancing optimizing the performances. Suppose your budget is resource are limited then you're this will be cost may become the constraint cost may become constraint at that time what you do your time you accept time of the may be delayed for the project. So, this way you manage the priorities of project tradeoffs. Next is the step 3, then what you do you create a work breakdown structure this is what is a work breakdown structure what this is called WBS. What is a WBS work breakdown structure? It is the hierarchical breakdown of your project into the smaller and smaller and smaller units this is called work breakdown structure like elemental breakdown of your elemental breakdown of your project.

If you see this how do you create a work breakdown structure the hierarchical breakdown as I told the project a project can be broken down to several major deliverables may might have different major deliverables this can further be broken down to sub deliverables. The sub deliverables can further be further be broken down to the lowest sub deliverable that is lowest management responsibility level then this can further be broken down to a group of work packages. Then that can ultimately further you break it down smaller and smaller the last activate last level is called the work package. It is an identifiable task or activities this is the work package level. So, we will be talking about work package and all a bit later.

So, what we will be so, this is a work breakdown structure. So, how work breakdown structure helps project manager? It helps project managers in different way in many ways such as work breakdown structure you can evaluate cost time performance from the

lowest level you know lowest level is the work package we told it. So, evaluate the what will be the time durations of the project, what will be the cost of the project, what should be the performance then you can plan schedule and budget for the overall project how you can do that I will be explaining it in the next point. Then also work breakdown structure assign responsibilities to different groups or different persons and level wise it also gives you the level wise information and organization breakdown structure. It also define communication channel and the coordinating the task this will be clear if you look at it.

So, each level each level major level sub floating level the lowest management level grouping each level you are the work package is you can assign the responsibility you can plan you can plan the cost time that is schedule the then the budget and the performances and all and lowest level is work package. I will explain that then what is a work package? Work package is the lowest level of work breakdown structure and every work package is nothing but a task or activities you know it defines it is broken down to a task or activities for which you can determine it is durations that is time you can determine it is cost or the budget and you can determine how much resources will be required like how many people will be required, what are the materials will be required, what are the equipment's will be required you can assign a responsibility for this each work package how many people will be doing that that is the work packages. Then monitoring it can also it used as a monitoring point or milestones for measuring. So, these work packages can be so, these are the work packages these work packages as we told can be rolled up to say group of work package then the lowest sub deliverable if you roll it up then sub deliverable, deliverable then the project. So, you can this cost and work package is having resource assignment, cost assignment, time assignment, responsibility assigned.

So, if you roll it up so, you will get the each level management level what are the responsibility, who are responsible, what is the cost involved, what is the time duration involved, what everything you can connect with the organizations different level, what should be the communication channel, who should know what everything can be done. So, work breakdown structure is a very important thing for defining the project. This is a work breakdown structure illustrative, this is a tablet prototype. This is your project it can be major deliverables or hardware, CPU and more items. Then suppose you take the CPU it may have sub deliverables power supply, flash rom, input output controller says suppose you take hardware it has frame say then cameras, speakers, antenna and lowest level is the work package.

These are the work package one work package these work packages. So, these work packages are having you are assigning a time, a cost, a resource, people, equipment. So,

you know these when you roll it up you can each level you can roll up and all can know all the information and who is doing what you can assign the duties also. Similarly, here input output controller this is the lowest level work package you roll it up this is another higher group of work package. These are sub deliverables, deliverables major deliverables all these you can do it.

This is the work breakdown structure. Now to what we have discussed now to sum it up we will do the conclusion what we have learnt in this lecture. This module discusses the steps in defining the project which include defining the project scope, establishing project priorities, priority tradeoff, concept of constraint, enhance and accept and also creating work breakdown structure and work package which are the keys to managing the project. This has been elaborately we have discussed. Now it also explains how WBS helps project manager, clients and other important stakeholders. Furthermore, this then the references the references you can go through these books.

These are the books you can go through and it can enhance your knowledge on this defining the project more. And further I will talk about the scope of work I will show you in the next lectures and all. Thank you very much for attending this lecture.