

# **Project Management: Planning, Execution, Evaluation And Control**

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**Lecture- 04**

Welcome to the course Project Management Planning, we were continuing in the last lecture the module 2. In module 2 is the organization strategy and project selection. In today's lecture, we will cover the project governance and design of project portfolio system. And in this lecture the topics that will be covered are project governance and integrative approach, then design of project portfolio system. Under that there are the classifications of projects, then we will discuss about the financial criteria of project selection, different financial metrics are available. We will talk about the NPV or the net present value IRR, internal rate of return and payback period.

These are the things we will be covering in this lecture. In the next lecture, then the others will be covering in the next lecture. To start with project governance and integrative approach, in the very first module we have just talked about the project governance. Then we have told that we will be covering in depth in the today's lecture.

Say why does an organization require a project governance? You consider a large organizations like Google, Apple or the Sony or the General Electric, ExxonMobil, Chevron or in our own country ONGC, Oil India, BHEL. These are the big organizations at any point of time they are having say thousands of projects and how do they select those thousands of projects? How do they manage those the governance of those thousands of projects? How do they allocate resources to these projects? How do they give the responsibilities to different teams, different individuals? So this is not a very easy task, it is a challenging task and for that you require a good project governance system which will take the care of all the your portfolio management and the projects and all. So, to do this first what you need is the creation of a project management office or the program management office and those program management offices are given sufficient power to oversee what are their functions? Their main functions is to monitor and

control the project management activities in the organization. There are thousands of the of projects are operating at any point of time, but the top management are not in a position to go all those thousand projects. So what they will do? top management are mostly interested in the high value critical or national those projects and all that may be a few dozens of project they can look at it, but they cannot ignore the other projects.

So these other projects are being monitored and controlled by this PMO. This is one of the activities of PMO. Then PMO is also on behalf of the senior management they monitor the resource usage in different projects and the resources are always scarce, number of projects are more. So there is always a competition, always some organization politics goes on to get more resources for their project, but for that one need to develop a priority project priority system and accordingly you allocate the resources. A high priority project must get priority for allocations of project because those are more beneficial or strategically aligned with the organization's objective, long term objectives.

So this is another work for the program management office. Then assess risk of projects. There are so many projects are there, but these projects must be go through the risk profile of the organization. So assessing risk of the project is one of the integral part of the program management office. Further to it that program management office also suggest the improvement measures.

How can the different projects can improve their handling, their activities, their resource sharing, their client's interface. So they generally suggest the improvement measures because the people who man this program management office are also the experts in project management. Then they apprise as I told you earlier the senior management because senior managements cannot look after these all thousand projects. They will be mostly involved in the few dozens of critical high value project. So they apprise and if any course corrections changes are required, so they are the ear and eyes of the senior management and also they provide a linkage between the senior management and the project manager and the project team because the project manager just cannot go to the senior management like that.

They have to go through this program management office. So these are the main functions of program or portfolio management office, but there are many more responsibilities they are having that we will be discussing a bit later in the after few slides or it may be in the next lecture. Now recently that there is an another thing has cropped up due to the very competitive fears the business world that is EPMO. EPMO is Enterprise Program Management Office and what is the difference between EPMO and a PMO? EPMO is a much higher level. The main responsibilities of Enterprise Program Management Office is to align the project objectives with the organization's strategic

objective.

Their main responsibility is to see the projects are project objectives are aligned with the strategic goals and strategic objectives of the organization. It has been observed that most of the projects fail and or cannot deliver the value of its worth because if the project objectives are not aligned to the strategic plan or the strategic goals or objectives of the organization then the project fails. So this is the main things that Enterprise Program Management Office do it and they select the projects whereas the PMO or Program Management Office they implement the help facilitating the implementation of the project, but EPMO they select the project which are more aligned degree of alignment are more to the strategic plan and strategic objectives of the organization. In a sense you can say EPMO is a top down approach whereas PMO is a bottom up approach and EPMO they report directly to the top management say chief operating officers or even the higher. So they are the linkage between the top management and the executive levels and all.

So they direct they select the project they direct the projects and all it is a top down approach whereas PMO they are the bottom up approach they facilitate implementations, monitoring, control of the projects. So these are the main difference between Enterprise Program Management Office and the Program Management Office. Next we will be going to the design of project portfolio system. How we design a project portfolio system? What are the criterias? So there are for that designing first thing we need is the classification of a project. How do you classify projects? As I told an organizations may have hundreds or thousands of project depending on the size of the organization, but all these projects there must be categorized you know they must be categorized in different category.

So how do you categorize the projects? Can any one of you tell it? I will answer it. So different mostly projects are classified in typically three ways like three ways like this. If you see this design of project portfolio system classifications are by the type. There may be some projects which are called compliance project that is the must do project. These are the mandatory by the rules regulations of the country.

You have to do that otherwise you will incur huge penalty or your plant may be shut down. Like the pollution control, waste materials and all wastage handling and all. Then maybe the emergency control these are the compliance project you have to do it there is no other way. So suppose in a building in a factory you must have a fire fighting system these are otherwise your factory will not be given the licenses. So these are the compliance project.

Suppose your emergency handling and all is big has become different you have to on word footing you have to do that fire fighting emergencies and all these are the compliance must do project. Then there are some projects which are called operational projects. Operational projects are one which you have to maintain your current level of activities. You cannot suppose if you are producing say steel so you just cannot stop producing it For operational purpose you have to maintain the current production level, current activity level these are the operational projects and here you may require to improve the efficiency, improve the performance of your work, improve the quality, reduce the cost. These are also required these projects are called operational project.

Can you tell the total quality management which it will come under which type of projects it is also a quality improvement, the performance improvement so it will come under the operational projects. So these are the operational projects. Then another type of projects are called strategic projects. These projects may not be economically viable now, but this project will fetch you revenue, give you the revenue streams in the future say 5 year sense or the 10 year sense. Suppose you are developing a next generation product.

So the next generations then it your technology those are called strategic projects. Those projects will give you revenue stream in the future say 10 years, 5 years and all. So these are the three types of classifications of a project. Of course you can have more or more types or different types depending on the characteristics of your organization, of your business, of your activity. Say another this program is we used to follow in our organization when we are doing it there are the four types of thing.

These are say if you see compliance project it is the bottoms are of the higher priority. compliance project gets the high priority. Then operational projects because you have to earn the revenue whatever the market shares you have to keep it. So these are the operational projects. Then come the strategic projects which will give you the revenue for the future.

Then another is the retrofitting project. What is retrofitting project? Retrofitting project is some suppose in your plant or factory you wanted to introduce new safety valve. The plant is maybe say old, but the safety valve what you were using it is say 10 or 15 years old. That is not very efficient. It often trips and as a result shutdown takes place.

So if you take a decision you replace all the safety valve in the plant. So it is a retrofitting project to improve your efficiency and safety. Similarly suppose in the plant and all you when you have made the plant your control panels, control panels and all instrumentation, instrumentation panel these were old, but in the market those

instrumentation panel has become obsolete. There are more advanced gadget has come. So you take a decision to replace all those to improve your efficiency, to improve your safety, quality.

So you these are called the retrofitting project. You take a decision to replace all your instrumentation panels and all with the latest advanced technology panel. So these way the different organizations have different classification, but your ongoing programs always are considered with higher priority than the new program regardless of objective because once you have invested in some projects or program you just cannot stop it. So new programs can come later, but the ongoing program commands a higher priority. So these are the classifications generally being done, classification those are being done.

Now coming to the other thing, this is the classification of project. Then what we will be doing? There are selection criteria. Now we will be going how do you select the project? So you have so many projects, thousands of projects all are competing with each other. So what is the criteria? You have to specify criteria for selection otherwise what happens? The organization politics takes place. The high ranking official or a manager who is very pushy they can get through their projects and all approve and whereas a real need projects may not get approved.

So for that you need to have a selection criteria. We will talk about this. You know in organization politics and all one thing I wanted to again tell you that there are some projects called sacred cow. What are this sacred cow project are those projects which a high ranking officials suppose CEO wants to push through it may be the CEO's pet project. But it is not aligned to the strategic objectives of the organization that will not give you any strategic value for the organization.

But those are there because the high ranking official wants that. Those are called sacred cow project. If you have a proper selection criteria such organization politics such things can be reduced. Then also we will be the sources of proposal and all we will be discussing later. Now first go through this selection criteria.

What are the selections criteria? The selection criteria are there may be financial or economic criteria and there may be the non-financial criteria. Then there may be multi criteria selection models. Then there under that there may be a checklist model, multi weighted scoring model. All these we will be discussing in this lecture the financial criteria and the rest of these we will be discussing in the next lecture. So let us go for this financial criteria for selections of projects.

What are these? There are many financial models are available like payback model.

What is payback model? Payback model is the you make an investment that how first you get back that investment amount that is called payback model. There are other models also I will just tell you then we will discuss one by one. Net present value or NPV model. Then internal rate of return IRR this and we will also discuss about why this we will be talking a bit late.

So first discuss about the payback model. The payback model is what as I told you payback model is the initial investment you make how fast you can how fast you can recover that money. So how do you do that? Like payback model I will just write it down for you. Payback period equal to that estimated cost of the project that is your investment you are making divided by annual savings that is annual savings. Suppose you have invested 10 for a project 10 million dollar and you consider your annual savings is for the will be will be 2 million per year will be there. Then what will be your payback for this? Payback period will be  $10 \div 2$  that is 5 years.

This is say project A. Suppose in payback period of project B you invested 10 million 10 million dollar suppose your annual savings it is giving 2.5 million per year. So what is your payback?  $10 \div 2.5$  is 4 years. So which one you will choose? You will choose which is the less payback period because you get your initial investment within 4 years.

So you the lesser the payback period you choose that. This method is very simple and it can be understood by everyone most of the managers. So here what criteria is the project which is having lesser payback then that is being chosen. So the advantage of this method is very simple and can be calculated very fast and all. But the disadvantage of this system is payback period is it does not consider the time value of money.

So it considers the profitability and but disadvantage it does not the time value of money. We will talk about the time value of money just after few minutes. So and also the one is that it does not consider time value of money. Second thing is it considers only the period in which your investments are being paid back. But it may happen so that over the life of the project the other one say payback of A it is 5 years but it may happen so that over the time of the project say for 15 years it will project A may give more revenue more profit than project B.

So it does not consider the entire length of that period. So it is only limited to this the payback period. So these are the disadvantages. Now I will be coming to the net present value model and the internal rate of return. For that we must know the we have to discount the discount the what we have to discount the future cash flows and its underlying principle.

We must know this what is the discount this time value of money and how why should you discount it. I will be just going to this. So for this I will be explaining you the firstly the time value of money. What is that time value of money? Time value of money all of you know is suppose you invest say principal investment is P suppose today and your interest rate is R. So we simply know that the compound interest formula it is future value of P is dependent on the your initial initial investment P into  $1 + R$  is the interest rate it may be 10 percent and that P is the year number of year if it is 1 year 2 year 3 year it goes like this.

So if your interest rate increases and number of years P increases what happens your future value will increase increase. Now the if you put it the other way suppose your present value present value of your of what your initial investment it will be  $P / (1 + R)^t$ . So this R is called the discount factor. What is that discount factor? Like now if your R the interest rate interest rate is increases what happened your present value increase or decrease.

Since it is in denominator it will decrease. So this is called the discount factor. So if the R discount factors is decreases then what happens your present value increases. So this R is called discount factor. This is the all of you we know the time value of money. Now what will be going the what is NPV? NPV is the this present value the present value of NPV how do you calculate it? NPV of the present net present value equal to cash flow like C cash flow of year 1 divided by  $1 + R$  and it is to the power 1 first year plus cash flow of cash flows are the in it is coming into your divided by  $1 + R$  square plus  $CF_3$  by  $1 + R$  cube.

You go like this and what you get CF at the year n equal to what you get that the  $1 + R$  T instead of n let us put it T let us do it T. So what does NPV comes here NPV this plus what you get plus your initial investment minus  $I_0$  initial investment is your outflow these are the your inflows cash flow 1 2 3 inflows plus this initial it is minus because of it is a outflow. So NPV becomes you can write it down  $\sum_{t=1}^T CF_t / (1 + R)^t - I_0$  where T equal to 1 2 2 T this is the NPV value that is sigma your cash flow in and your discounted factor to the power T plus your initial investment that is negative it is NPV. Now what is the profitability index? you can find out the profitability index profitability index comes as a as your total cash flow in what is the total cash flow in this is your total cash flow in that is  $\sum_{t=1}^T CF_t / (1 + R)^t - I_0$  that is the initial investment here you do not put minus this is this ratio is called profitability index so T equal to 1 2 T. So what is this  $CF_2 / (1 + R)^2 + I_0$  plus investment these we can write it down  $CF_t / (1 + R)^t$  this one we can write it NPV plus  $I_0$  you are transposing this

initial investment this side so plus I 0 divided by I 0 equal to 1 plus NPV divided by I 0 this is the profitability index you can find it out.

Now let us go to this how does this NPV and IRR say if you draw a graph this is the graph this is the "discount factor" discount rate or factor and this is NPV see if the discount rate increases how steeply NPV is falling and the if you go this out means discount rate decreases then your NPV is rising the point at which the discount rate becomes 0 NPV at this point NPV becomes 0 this becomes this is called IRR that means you can see the point the point where discount rate discount rate touch a point where not discount rate the the NPV becomes 0 the point where NPV becomes 0 the discount rate that is the that is the discount rate that is the discount rate discount rate where NPV becomes 0 NPV becomes 0 is called IRR this is the IRR these are the ways it is being done. So, you have got the concept and how do you find IRR you have to do trial and error method to find out the exact point where NPV becomes 0. So, that is the form the part of it we have discussed the formula now we will be solving a problem then your your concepts will be clear now let us see this problem and solve it. Say problem says you just go through the problem alpha company is evaluating two similar projects whose initial investment and expected future cash flow are shown in the following table what is this following table in this table table what you say there are two projects project X and project Y the cash flows are year Y 0 year 0 means it is the outflow 800 and the 850 then these are the inflows year 1 year 2 year 3 year 4 year 5 and project wise why these are the inflows for this. So, now what is the problem says the company expects to earn at least 14 percent on its investment.

what is this this 14 percent is nothing but it is the discount rate discount factor is 14 percent the then the financial advisor of the company has informed that inflation would remain stable at 2 percent for the entire period. So, inflation is 2 percent. So, based on financial consideration determine the payback period NPV and profitability index of both projects which projects the company would fund. So, we have to find out the NPV of both the projects and also payback period and which projects to be done. So, what one more thing that I just wanted to tell you like if you find the NPV ,if NPV is positive then only you that means you are creating wealth you are in you are earning more than your investment.

So, you choose that project which are the NPV NPV's are positive, but if the NPV is negative means you are losing. So, you reject that project you do not accept the project and if there are two or more projects all are having positive then what you do you choose the project which is having highest NPV. That means that project will give you the highest wealth over the span of the project life. So, you will be increasing choosing the highest NPV project. Similarly, profitability index should be more than 1 then only you



accept the project.

So,  $1 + NPV / I_0$  if it is less than 1 means the project will be losing. So, you will not be earning more. So, you reject when it is less than 1 you reject the project. These are the fundamental things for this.

Now, we will be solving this problem. So, we have covered a lot in this lecture and there are paucity of time. So, we will be solving this problem in the next lecture. So, therefore, we conclude today's lecture as follows like in the last lecture we have done those project governance and those need for strong portfolio management systems and all with continuation of that in this class we have discussed the project governance and its need for an integrative approach. We also talked about the design of project portfolio system, classifications of projects, reductions of portfolio risk, developing project selection criteria and promoting transparency for selection of project, so as to reduce the organization politics.

This module also elucidates financial criteria for project selection. We have discussed about the payback period, net present value, profitability index and internal rate of return. In the next lecture we will be solving the problem which we could not do it in this class. Now, the references for this module are, these are the books you can go through and it will give you the complete pictures of the project selections and organization strategy. So, thank you very much for attending this lecture.