Course Name -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. We are continuing model 7 that is Project Risk Management. In this lecture we will be discussing about the risk assessment. So, to start with the concepts that will be covered in this lecture are risk assessment, we will be focusing on how to assess risk in this lecture. And subsequent lectures we will be covering the other risk management processes.

So, we have already seen in the last lecture this is the heart of risk management process, we have completed the risk identification which is step 1 of the risk management process. This we have discussed in detail in the previous lecture. In this lecture, we will be discussing with the risk assessment. So, what is this risk assessment and how do you carry out risk assessment? Generally, the most common practices that is followed are scenario analysis for the project risk.

So, what does this scenario analysis means? Here there are two parameters that are important to measure or evaluate the risk. These two parameters are probability of occurrence of risk that is likelihood of risk occurrence and the impact if the risk happens the impact of the risk the damage it may do that is the impact of the risk. These two parameters will determine the risk value we will be looking at it. Then we will have the based on this risk assessment matrix, then we will be doing the failure mode effect of analysis and probability analysis like the cash flow variance and all the risk of cash flow investment risk and all we will be subsequently discussing. Now, the likelihood and impact these are the two parameters as we have, I have stated.

So, so suppose your project manager is struck by a light lightning. So, then the what will be the impact of this risk? Impact will be huge it will have a catastrophic effect. So, impact is huge, but the what is the likelihood of such an event that is insignificant is so low. So, if you multiply the probability of occurrence into the impact you will find this is an insignificant risk. Similarly, your expert specialist of the project specialist he is living

the job that is a risk.

So, what is the impact of this risk that impact will be very high the key project person or project specialist is living the job, but what are the likelihood of happening? that likelihood or probability of occurrence is also high because he may get a job from other project management company. So, the impact of the impact into likelihood for this case is higher. So, it has a large risk value. So, this risk will get priority through the higher value of risk. So, you have to make a response plan for that to mitigate that risk that we will be discussing in the next step is risk response development maybe you give them more incentive.

So, that they are retained or maybe you develop give training to many other staff many other employees. So, that even the key persons leave there are people who are competent enough to fill in that gap. So, this may be the response plan. So, this way you do the risk assessment matrix. Now, we will be going for this risk We will discuss, how do you measure the risk that you have we develop a risk severity matrix.

What is a risk severity matrix? This is a risk severity matrix say here you see this is the x-axis is the y axis is the probability of occurrence that is the likelihood and x-axis is the impact of having the risk that is the impact. So, you make a scale. So, any scale you can develop yourself from say here we have for illustrative purpose we have taken 1 to 5 scale. So, these are the high-risk high likelihood high chances of occurrence. this is the medium-high this is the medium chance of occurrence this is the one is the low and this is the medium low.

Similarly, the impact you also can make it a 5 scale. So, the risk which will fall now the high chances of occurrence and high impact. So, these are the priority risk because this value risk value is high for this risk. So, the risk which are falling in this red zone are the priority risk to treat. So, actually and this is the medium risk the yellow zone is the medium or the moderate risk and green is the insignificant risk or minor risk.

So, your first preference for the first priority for the organizations will be to deal with the risk which has high priority. this area for the risk which falls in this area followed by this yellow and that these are you generally ignore for the time being unless that goes the to the yellow zone or the red zone. Usually, the graph is not exactly this is shown to you for representative purpose illustrative purpose usually, this thing goes not exactly like that it generally goes like that this way you know this. So, it follows something like it so, here also you can put it you can prioritize the risk because in an organization there may be thousands of risks. So, it is not possible to deal with all risks at the same time.

So, you have to prioritize the risk high value risk you take on priority followed by the others. So, this is called risk severity matrix. Now, another thing is called failure mode and effects analysis FEMA that is what is FEMA. Now, here you introduce one more parameter say detection difficulty suppose some of the risk you are very easy to detect. suppose a fan or a slab is hanging precariously you can make out that this is a risk suppose a cable is going on the floor of the room in your in the office.

So, there are you can make out that there are chances that people may trip. So, these are the easy to detect, but there are some risks as I gave you those are very difficult to detect. So, you give another the ratings for 1 to 5 scale and that is called FEMA. So, in FEMA the risk value risk value will become risk value will become likelihood into impact into detection difficulty. This is will give you the risk value.

This is the risk value you get the likelihood into impact into detection difficulty. So, next we will be going for it like now we have discussed that we have given this you know this this impact scale the 1 to 5 for likelihood and for this impact. So, how do you decide this 1 2 3 4 5. This scale because different people may have different perception. So, you have to standardize it.

So, that the entire organizations have to be have a standard for marking it. So, that is way you have to define scales conditions for your impact scale of a risk or major project objective. Suppose your project objectives are generally cost, time, scope and quality. So, you have to you are had to measure it with a 1 to 5 scale 1 is very low, 2 is low, 3 is moderate 4 is high 5 is very high. So, suppose the insignificant cost increase it is you give the very low 1 rating is 1 less than 10 percent cost increase that is you get give a low 2 value then moderate 10 to 20 percent cost increase you gave 3 then the high is 20 to 40 percent cost increase very high 40 percent more than 40 percent cost high.

So, you that way you are specifying some guidelines. Similarly, for the time insignificant time increase that is you give a rating of very low then 1, then 2 is less than 5 percent time increase 5 to 10 percent time increase is moderate 10 to 20 percent time increase is high and more than 20 percent increase in time you are giving it very high. So, you are specifying some conditions some benchmark for your organization. So, that the impact scales are not varying from party person to person. So, this way you have to develop this.

So, now this looks like say this is a risk assessment form. So, how do you assess the risk? Now, I will give you an exercise we have done the risk identification you list down 5 or 6 risks of your organizations or of your group or your domain of work whatever you are conversant with you identify 5 to 6 numbers of risk in the next 4 -5 minutes. After identifying these 5 6 risks then what you will do then you have to assess the risk in this

format. So, you what you do in this format you note down the this column is the risk event the risk you have identified those 5 6 risk you put it here then you 1 to 5 scale you rate it what are the likelihood and what are the impact then you can ignore detection difficulty that is not required now and also you make a column when this risk may that is you have to identify when this risk is likely to occur suppose here the in this illustrative example interface problem. So, this may when it is likely to happen when the conversion takes place interface that time it may come up.

Then system freezing system freezing this risk event may occur during the startup say and user backlash generally of may occur at the post-installation then hardware malfunctioning it will occur at installation. So, you also specify those risks when it is likely to happen so that you are better prepared for this. So, now, your exercise I have given you have to do that you identify those 5 6 risks of your domain of work or of your organization you are aware of it then put a likelihood impact and when it is happening ok. This you do this is the risk assessment form after this now based on the following this is an exercise for you have to do you have to tell me this based on the following information prioritize the risk event which will be event should you be most concerned about. So, here are the risk events has been given there are 5 events and the likelihood and impacts are given.

Now, you tell which risk are the get the high priority and which will get the low priority rather you give what you give is what you propose is rank the risk. So, please do it yourself then I will come in I believe you have done yourself. So, this is a risk value we have done, but 2 into 3 likelihood impact 2 into 3 equals to 6 this is 3 into 5. So, if this is 15.

this is 1 into 5. So, equal to 5 this is 2 into 2 equals to 4 this is 5 1 into 5 equals to 5. So, this one gets the 15 is the is the rank 1 high priority it will get no this is the highest then second is the rank 2 is the design flow is the highest priority then comes the bad weather thereafter comes the what this 2 are the same 3 this and this is the last this the last priority. So, this way you can assess the risk value and hope it is clear. Next, we will be going through some of the illustrative things given for a major company reputed company how do they measure the risk as I told you to measure the risk each company based on its volume of business, the type of business and the and the industry benchmark and all they have to develop their risk likelihood and also the scale this is the scale for risk likelihood of that company and the scale of risk impact. So, you can also develop for your organization such a scale say here likelihood that is probability of occurrence.

So, what happens here if the occurrence is happening more than 1 in a year frequency of occurring. So, it is you give a frequent if it is happening once in 5 years it is likely you

give 2 then that company is following this now if the occurrence of the risk is once in 10s years, then it is 3 that possible. then if it occurs once in 25 years it is unlikely once in 100 years rare once in 1000s year very rare and financial impact that company used to follow is if it is less than 1 million it is non-applicable, they do not consider is any impact we have any risk impact. So, if it is 1 million then it is called incidental 1 then 5 million USD it is a minor risk for the company. 50 million is a moderate risk 100 million is the major risk and more than 500 million the company thinks is a severe risk.

So, you can also develop such a scale this is just an illustrative one says these are the scales for monetary and non-monetary impact likelihood and those impacts that company used to follow that XYZ company follow say these are the very high risk. they follow the risk which falls in this region are very high risk for them they are get the priority for treatment then the these are the high risk and these are the medium risk they and this risk are low or insignificant risk this is one of the illustrative examples of an organizations which were having their risk management plan. So, this is the measuring of risk now another thing I have not touched it know I will go for it. So, this is that probability analysis you know we have talked about all these FEMA and all now probability analysis that is the you can also assess the risk with the decision tree and in the financial risk like NPV you know statistical variations of NPV is measured through the cash flow and what they do the cash flow past projects cash flow is compared with the compared with the cost graph that is the S curve graph they compare with and with that baseline and the over-the-project life cycle. So, you can see the variation correlations and all cash flow those are variations you can find and the if any risk are there or not you can find it out.

So, this is the probability analysis that is generally done. So, we have done all those things. now let us come to the conclusion to summarize what we have discussed in this lecture we can say the in continuation with the previous lecture in this session we have illustrated how to measure risk that is assessing risk value and prioritizing the risk then also we have developed risk severity matrix that contains likelihood or probability of occurrence and impact of risk and we also have shown the typical risk assessment form. This we have also illustrated scales of likelihood and impact followed in real life by large reputed companies. So, these will help you to give the essence of assessment risk assessment.

Now, the references I am giving these are the books you can follow and further improve your knowledge. Thank you very much for attending today's lecture.