

Project Management for Managers
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Lecture - 19
Risk Management – I

Good morning friends, I welcome you all in this session. In today session we are going to talk about risk management as seen in the very beginning I told you that a project management should be studied on ten different areas and I told you that there are ten areas and the short form of those ten areas is Perth SSQCC right.

So, let me tell you what is the full form of this when we say P it is procurement management I is for integration management r is for risk management risk management I am again repeating because it is this topic of today's class. So, risk management then you have got time management you have got human resource management and then you have got scope management stakeholders management quality management then you have got communication management and cost management right. So, out of all those ten areas I would say that one of the top 3 important areas is risk management.

So, whenever you come up with any project you should be able to know a priori what would be the possible risks that project might face and when I say risk can be can be a marketing risk or a technical risk or any other type of risks there are several types of risks. So, being a good manager you should be able to at least know little bit about what are different risk your project can face right. So, let us get started projects generally operate in an environment of uncertainty and. In fact, we do all those planning staffing organizing and all other stuff in management why we do all those things because of uncertain future if everything is set and then you just plan months and execute it right.

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Risk

Projects operate in an environment of uncertainty (PESTLE).

Project risk – any possible event that can negatively affect the viability of a project.

It is the planning which makes difference between successful and failure projects.

Risk management - the art and science of identifying, analyzing, and responding to risk factors throughout the life of a project and in the best interest of its objectives.

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But we will we keep on doing planning re-planning execution re execution and so on right. So, environment is very uncertain and environment can be again classified into micro environment and macro environment. So, when I talk about micro environment I generally talk about PESTLE analysis; it is called PESTLE analysis or staple analysis right. So, let me tell you; what are different factors which affect your project. So, you have got let say political environment of a country. So, let say if you want to start a project in India nowadays political environment is quite stable, but if I ask you to start a project in let say Syria right there is no political environment as such right.

So, you cannot have a project over there then you should have economic environment of the country when I say economic environment means what are different you know GDP level of a country what is an np level of a country is it. So, all those economic aspects come into this particular set of PESTLE analysis right when I say social factors also play an important role in successful completion of a project you have got technological factors you have got legal factors very important legal framework. In fact, I will give you a let me give you an example there are several MNCs working in India and our market is quite an open one and several MNCs have got their plants in India and let us say suppose if tomorrow a new government comes and cancels all the policies related to installation of plants in India.

Then what will happen to those companies. In fact, they should have protection of legal framework in that case. So, our legal system is quite a strong one. So, this is also an important factor whenever we go for implementation of a project and then ecological factors you should also look at them carefully right. So, it is called PESTLE analysis right you should see our all environment of a of a country right.

So, let us define what is project risk project risk is any possible event that can negatively affect the viability of project. So, let us say if I am coming up with a new product tomorrow and it is doing let say if we if it does well and after let say one month government comes up with a policy which is affecting that particular product. So, that is that is actually a kind of political risk right. So, that would be an event that would be affecting my project negatively right. So, when you when you compare successful projects and unsuccessful projects then there are several reasons for completing a project in a successful manner.

But planning is one of the factors which affect successful projects more than other factors. So, you need to plan re plan and then you need to execute right. So, when we talked about risk management risk management is broader concept you need it is basically an art and science of identifying risk first of all you should know what is the risk for your project if you do not identify it properly then you cannot even analyze you cannot come up with corrective actions and so on right.

So, the first and foremost thing is you need to identify risk properly analyze that risk and responding and respond to risk factors throughout life of the project because as I have already talked about there are different life cycle stages in a in a project. So, in each stage you will have a different type in each stage you will have a different type of risk in initial stage you will have a different kind of risk and during implementation stage you will have different kinds of risks right.

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Process of Risk Management

- What is likely to happen? (The probability and impact)
- What can be done to minimize probability or impact of these events?
- What are the warning signs (clues one should look for?)
- What are the likely outcomes of these problems and my actions?

Project Risk – (Probability of Event)(Consequences of Event)

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So, risk management is basically a process which will be there right from the beginning to completion of the project. So, the process of risk management is like this first of all what is likely to happen what is that which may affect my project negatively right and what is the probability of happening that event and what would be the impact of that event. So, first of all you should know; what is the probability of happening of a risk and how that risk is affecting my project right just to give you an example what is the probability that I am not delivering today's session.

Now, there is a possibility that let us say some technical problem in my laptop right what would be the impact of that and I and I can identify the probability of you know the technical fault in my laptop from past data how many times laptop did not work in past right. So, by using pass data I can find out what is the probability of filling my laptop right and what would be the impact of that the impact would be that I will not be able to choose this particular session right. So, in this way you can you should try to identify probability of risks and what are what would be the impact of those risks on your project right once you are done with this first step you just move on to second step.

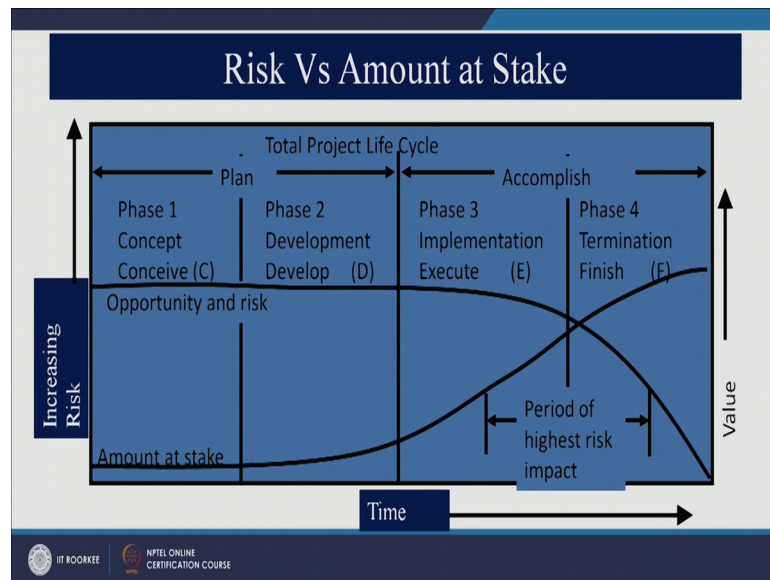
What can be done to minimize probability or impact of these risks right? So, once I know probability of failing of this particular laptop from next time I should come up with some corrective actions right I should have a technical person with me. So, I would be able to reduce the probability of happening that particular risk right. So, I should come up with

different plans how to minimize the impact of a particular risk on a project right what are the warning signs know this is very important when I say probability of failing this particular laptop before any machine or any equipment or any project fails they give you some signals there are very few things which fail suddenly.

But most of the things they give you signal of failure before actual failure right. So, you should you should you should try to catch those signals right if you are able to catch those signals then you can know that this is this might be a risk in future for your project. So, let us look and then what are the; what are the likelihood outcomes of those problems and my actions right. So, let us define; what is project risk I just said risk means any event which is affectively which is negatively affecting your project right.

So, project risk you can mathematically define as probability of event and consequences of event right. So, multiplication these 2 is nothing, but project risk right probability of event and consequences of that event. So, that is project risk right now if you look at this slide.

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Now, if you look at this slide this curve is amount at stake in a project because you would be carrying a lot of money in a project. So, amount of stake increases as the project life cycle moves from planning to execution to finishing phase right. So, this is amount of mounted stake right.

Now if you look at this particular slide there are 4 phases you have got initial conceptual phase you are developing project. So, during these 2 phases you have got lots of opportunities you can do several things in your in your project you can change design you can change manufacturing process you can have a new set of people right. So, here you have got more and more opportunities in the beginning right when you move towards completion phase these opportunities keep decreasing right and this is a point where these 2 curves intersect right.

Now, this is a point where you are almost finished with your implementation phase or towards end of implementation phase right and if you go for any changes in at this particular point then this point is known as period of highest risk impact right. So, the maximum loss would be somewhere here right. So, this is the relationship between time and risk right.

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Four Stages of Risk Management

1. **Risk identification:** determine specific risk factors.
2. **Analysis** of probability and consequences: the potential impact of these risk factors, determined by how likely they are to occur and the effect they would have on the project if they did occur.
3. **Risk mitigation** strategies: steps to minimize the potential impact of those risks.
4. **Control** and documentation: creating a knowledge base for future projects based on lesson learned.

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Now in risk management there are 4 stages first is risk identification as I said you need to find out what are the possible risks right one risks are identified then analysis of probability of consequences right what would be the effect of those risks right.

The third one is risk mitigation strategy now you should you should come up with what are what are your strategies how to avoid those risk or how to transfer those risks or how to accept those risk right. So, you can have different strategies for risk mitigation right then once you have you are done with risk mitigation strategies then you should have

control in documentation you should have you should have documentation process very very very properly and should be done in a smooth manner right because when you when you encounter a risk you would get several learning from that risk you would. So, you should know you should to create a document right. So, that would act as a basis for future projects.

So, you can know what suppose if something happens of similar nature in your future projects then you can take appropriate action because you have already documented what had happened last time right. So, this we will see these processes these 4 stages in details right.

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The slide is titled "Risks commonly fall into one or more of the following classification Clusters". It is divided into two main sections, each with a list of risk categories. The left section lists: Financial, Technical, Contractual/Legal, and Common Types (with sub-points: Absenteeism, Resignation, Staff pulled away, Time overruns). The right section lists: Commercial and Execution (with sub-points: Skills unavailable, Ineffective Training, Specs incomplete/initial specs poorly specified, Change orders). The slide footer includes logos for IIT ROORKEE and NPTEL ONLINE CERTIFICATION COURSE.

Cluster	Risks
Financial	• Financial
Technical	• Technical
Contractual/Legal	• Contractual/Legal
Common Types	• Common Types <ul style="list-style-type: none">– Absenteeism– Resignation– Staff pulled away– Time overruns
Commercial	• Commercial
Execution	• Execution <ul style="list-style-type: none">• Skills unavailable• Ineffective Training• Specs incomplete/initial specs poorly specified• Change orders

Before I go for detailing of these 4 stages let us look at couple of types of risks. So, broadly you can classify them as internal or external risks right. So, financial risk your project is ready, but you are not able to get let say loan from bank right or let say you have got loan from bank, but you did not get second installment in time right.

Or let say interest rate is very high right. So, these are financial risks you can have technical risks right let say you are you are come up with a product, but due to some problem in n machine tools you are not able to make that particular product right. So, you may have technical risk also right then contractual and legal risk because you are let say you are signed an agreement with the supplier of raw material, but because of some problem between these 2 between yourself and your supplier the matter is now in court

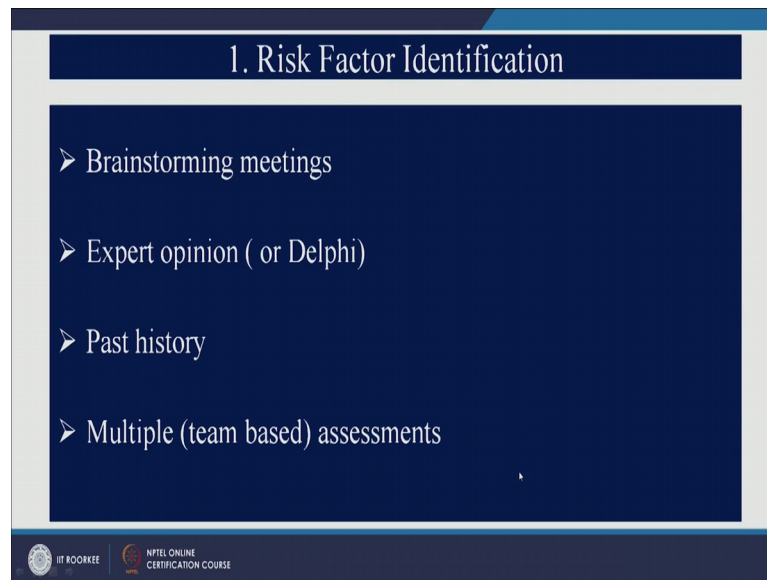
of law right. So, you will not get material in time right. So, that is contractual or legal risk right.

Then you have got commercial risk and execution risk as I said there are several risks during execution stage right and if something goes wrong in this stage you would be at loss right. In fact, all these stakeholders would be at loss apart from these risks there are some common types of risks absenteeism. So, very big problem these days in industry especially in manufacturing industries absenteeism and you need to find out what are the reasons for absenteeism right.

Why workers are no employees are not coming to the factory or plant regularly right resignations why people are resigning are they getting he is there any problem with the environment of your company right. So, you need to come up with the reasons for resignations if there are right stuff pulled away by your competitors right. So, there is a shortage of skilled manpower right. So, there is always a risk that you are skilled manpower would be pulled away by your competitors right. So, time hour runs of a project because of non availability of resources on time your project may go for it may it may not be completed within time right. So, that is time over runs its skills have unavailability it is a problem.

In effective training, so, it is good to train and retrain your employees right specification in complete or initially specification poorly specified let us say I am a manufacturer and I have given design task to let say third party. So, if I do not give proper specifications to the designer you would not be able to design part properly right. So, that is again a risk change orders generally what happens let say if you have received a project from a client what happens many times your clients will ask for several changes in your project. So, those change orders will cost you a lot. So, that is also a kind of risk because at the end of the day cost of the project would increase right.

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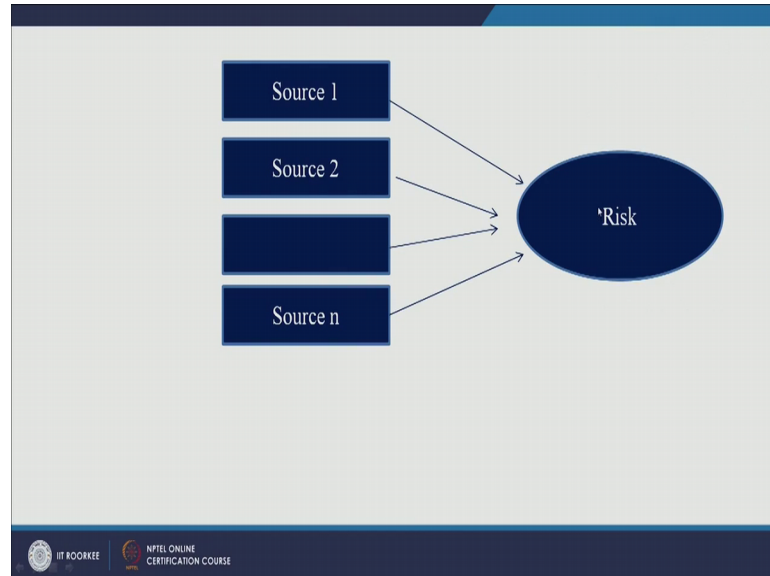
So, how to identify a risk very important as I said if you identify risk properly then your half of the job is done right there is a saying well begun is half done right. So, if you identify risk properly then how to how to mitigate that risk is not a problem right. So, it is good to go for brainstorming sessions and it is good to have experts from different functions of the organization. So, brainstorming session can be structured or unstructured in structured brainstorming session let every member of the team of the brainstorming session come up with 1 or 2 risks right.

In unstructured brainstorming session anyone can come up with a risk right. So, that is brainstorming meetings if your product is new then you can also take expert opinion right if not expert opinion then you may go for Delphi method. In fact, it is good to go for Delphi method because in Delphi method you have got to you ask for different risks to different experts you summarize their opinion and then again you go for second round of questionnaire; questionnairing to the experts.

So, we will ask them again second time what are the possible risks right and we will in second round of Delphi method we will share the opinions expressed by experts in first round to all other or to all the experts past history if you have got past data then we can know what would be the possible risks in future right. So, it is kind of time series analysis right it is kind of you can you can forecast your past data right into future then multiple team based assessment you can you can have you can form different teams let

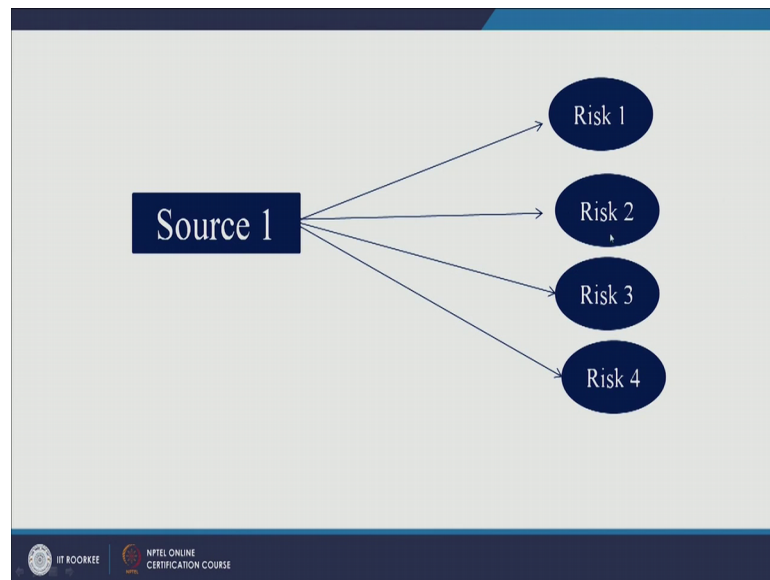
us say you can have a technical team you can have marketing team you can have quality team and let them come up with different risks right.

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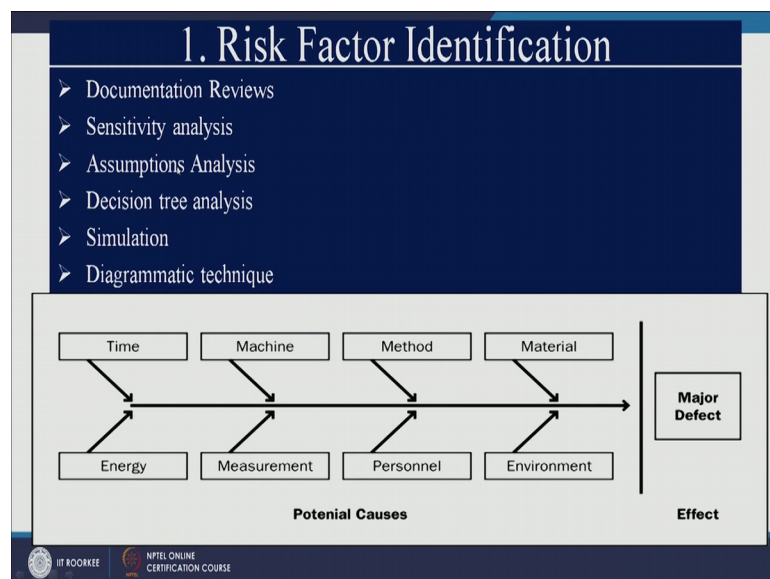
So, this is very important step risk factor identification once you are you have identified risk then it is possible that a risk make the result of several sources right. So, let us say your product has failed or let say the sales of your product is decreasing right now that could be due to several reasons your sales managers are not properly working there is a quality problem. So, you can have several resources for one particular risk right and you may have other situation where from one source you can have several risks. So, source one risk 1 2 3 4 5 and so on right. So, that can also be possible right from one source you can several risks from several sources you can one risk right.

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So, risk factor identification yeah this is what I just told you from one source you can have several risks right; so, apart from brainstorming session as I said apart from these methods of identifying risk.

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There are other ways also you can identify a risk documentation review since you have done documentation properly and you have also noted down risk which have occurred in your project in past. So, you can review those documents rights that would give you an idea about future risk and then another is something called sensitivity analysis.

Sensitivity analysis means how your output would change with change in input right. So, if you are let say if you are a car manufacturer and let say if you have come up with a new breaking system right; so, how that breaking system would affect the performance of the car right. So, all these are such type of experiments can be performed in lab itself or in plant itself. So, this is sensitivity analysis what will happen if something let say if input is changed and what will happen to the output because of that particular change right then you got assumptions analysis now this is something which one of the reasons for most of the risks whenever we plan something or when we come up with every with a new project we make several positive assumptions we are very very much optimistic.

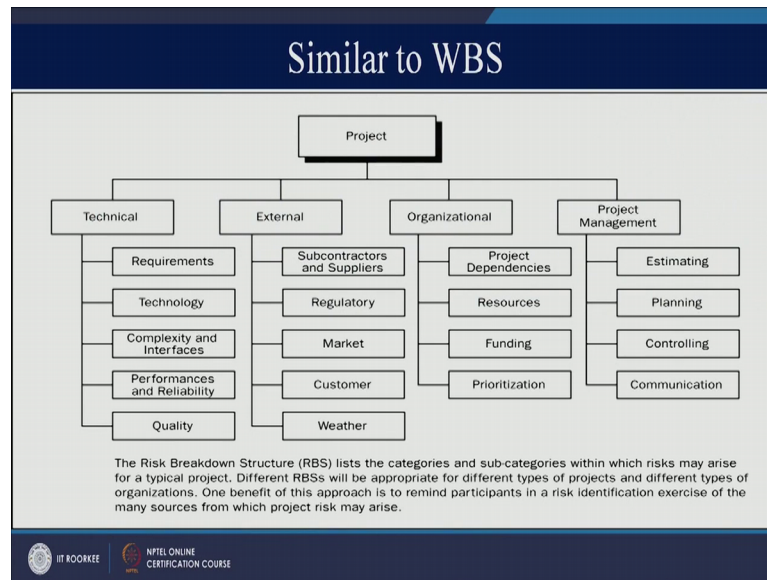
We are very much optimistic about future right. So, we say that we will get loan in time we will get material in time we will have technical experts in time. So, when we make all these assumptions, but most of the times assumptions may go wrong right. So, you should look at your assumptions carefully analyze your assumptions carefully right and there is something called decision tree analysis let me skip this there is something called simulation a simulation is basically the imitation of real life situation and generally we use simulation when your environment is highly uncertain right and then you may have diagrammatic technique for risk identification right

So, let us say let us say there is a defect in your part. So, you need you want to find out what are the reasons for that defect. So, the defect in your product or in your part could be due to faulty raw material because your vendor had not supplied quality material it could be due to method right the process which you have applied for making that particular product right there may be a problem in machine right. So, let us say your machine tool is let some cutting tool is not properly working right. So, or let say there is some problem in machine itself right. So, is that problem is because of machine or sometime let us say time you are you are making a product at a time when it should not be made right.

So, is the time affecting quality of the product or energy or is anything wrong in measurement of let say dimensions of a raw material right is there any problem of operator; operator is not trend or is there any problem of environment right let say temperature pressure humidity and so on right. So, this is known as cause and defect diagram it is also known as fishbone diagram because it looks like fish bone right; so, very important technique for identification of risk right.

Now, whenever you are trying to identify risk you should come up with something called risk breakdown structure this is similar to work breakdown in structure you have seen what is work; work breakdown in structure in work breakdown structure we have got.

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Let us say at the top level you have got plants isn't it then you have got programs isn't it then project sub projects and so on; right. So, that is work breakdown in structure.

So, similar to that you need to come up with risk breakdown in structure for every project and this risk breakdown structure would be different for project different for every project and for every organization right. So, you should prepare RBS very carefully right. So, what are the possible risks right whether there is technical in nature or external or organizational or project management right, let us look at this external risk maybe subcontractors and suppliers right they have not supplied material in time regulatory risk government may come up with some new policy right isn't it.

Let say if you are in telecom sector then let us if triads comes with new policy tomorrow. So, that would be external risk right market risk there are several competitors customers customer risk because customers are very demanding these days weather risk right. So, these are external risk similarly you can have technical risk you can have organizational risk and you can have risk at project management level right and they are unable to estimate cost of the project properly right there they are unable to estimate completion time of the project improperly.

So, planning is not properly done controlling of several resource test is not done and there is no there is not much communicate amongst different team members isn't or amongst different departments of the organization. So, that is project management risk right. So, you should come up with RBS right risk breakdown in structure right. So, far we talked about risk identification right, the second the second stage is risk management assessment and we will see this in next session.

So, with this let me complete this particular session.

Thank you very much.