Product Engineering and Design Thinking

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Module - 04
Concept Generation and Testing
Lecture - 17
Concept Generation methods

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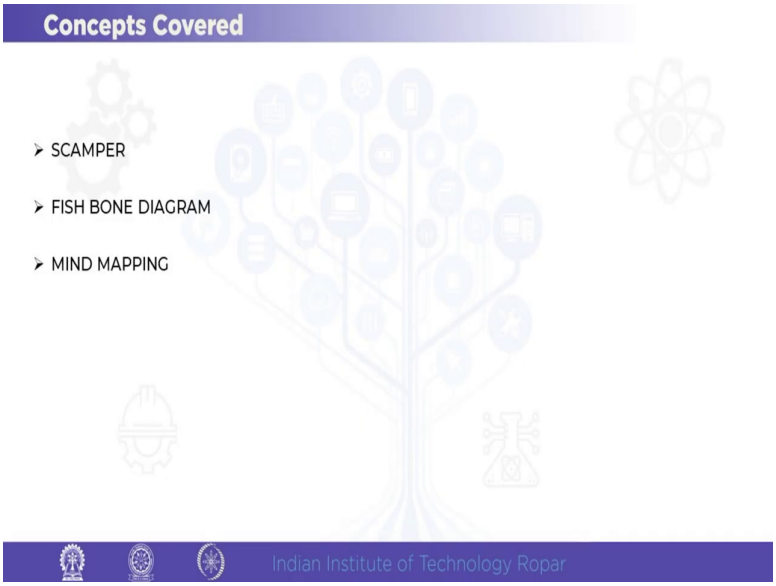

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Now, we will be learning about Scamper.

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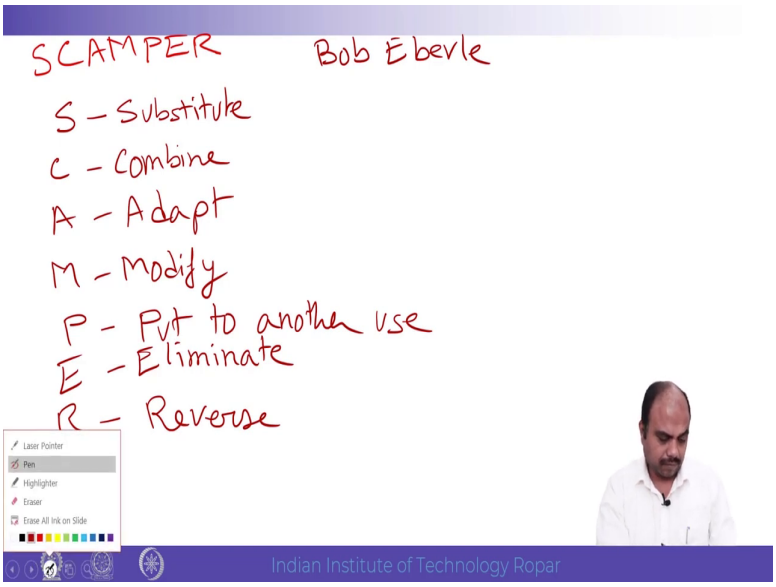

SCAMPER. It is basically acronym and this this is developed by Bob Eberle. And in this acronym is a scamper a acronym for a for this method we ask questions. So, the what does acronym stand for? S for substitute, C for combine, A for adapt, M for modify, P for put to another use, E for eliminate and R for reverse.

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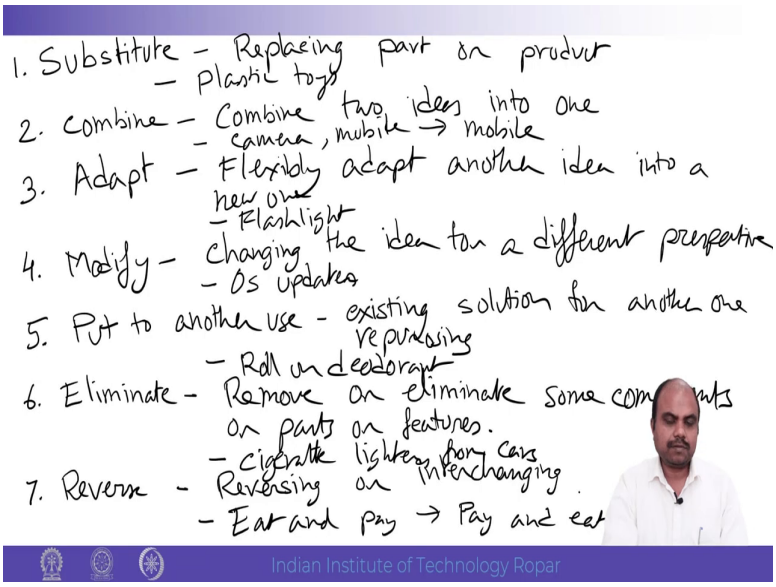

So, we will learn more on these in a details. So, in substitute, it is a basically technique which refers to replacing a part or product and to achieve something different and better. So, 1 is substitute; 2 is combine. Combine what we do? We combine two ideas into one. 3rd one is adapt. Adapt is basically increasing flexibility and to adapt something which means that flexibly another idea into a new one. Fourth one is modify. Here is that we are modifying which changing the idea for a bigger perspective for a different or bigger perspective.

Number 5 fifth is put to another use put to use. In this way the existing solution is purposed for another. See existing solution for another one another solution. Repurposing. The sixth possible thing is eliminate. In this it is eliminating some portions or part to make it simple (Refer Time: 05:14) maybe much more simple remove or eliminate some components. About reverse it is here. We are reversing or interchanging.

So, in this case what are some of the maybe you can say that examples or usage if you want to use these ideas how you can use these ideas. So, substitute maybe that if some component is there which is made of glass, ok and some tools some kids wanted to use that. So, instead of glass you make it plastic so, toys. So, plastic toys so, instead of glass toys or anything which can break we are using plastic toys. So, we are substituting the material and making it more usable for somebody some other user.

Combining – so, you can say that combining previously people used to carry camera. So, camera and mobile; so, now it is we have only mobile. So, camera is being combined with the mobile. Adapt – adapt means, so, once camera is there mobile is there then people start feeling that we should also enable them to take photo in the night. So, we need a flashlight. So, this is being added to a mobile. So, we are adapting it.

Then modify. Modify is many modification can be done. One is operating system update. You can see windows updates are coming now and then, even other updates are coming. So, these are basically it is modifying your system and the software which is there. Then put to another use – so, you can see that previously that many times the deodorant it is come as spray. But later on the ballpoint pen idea has been put in deodorant and that has come into the roll on deodorant.

Next is eliminate – eliminate means eliminate some of the features. What are the features? Nowadays, if you see that people are stopped and government is not supporting smoking. So, people now in many companies are eliminating this cigarette lighters from cars.

Reverse – so, here reverse is you change it such a way that you will see some restaurant you go. You can eat and then you can pay. That is the standard way. But there are some restaurant, say McDonald's. Like they if you go there you have to pay first and eat. So, it is like both are having advantage and disadvantages, ok. So, but then the model is reversing. Pay eat and pay to pay and eat ok. I hope you learnt scamper. Now, we will be learning about fish bone diagram.

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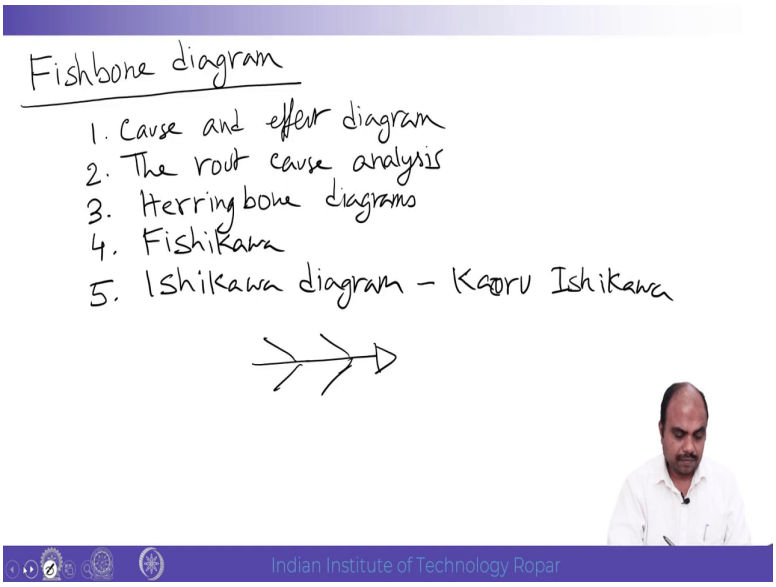

Fish bone diagram is a quite popular method. Especially find out the cause and effect. So, it is also known as cause and effect diagram. It is also known as the root cause analysis. It is also known as herringbone diagram. It is also known as Ishikawa. However, apart from fish bone diagram the most popular name of this fish bone diagram is Ishikawa diagram because this diagram is developed by Kaoru Ishikawa. And he is a he was a Japanese quality pioneer.

Now, you can ask why it is called fish bone diagram. The fish bone diagram why it is called because it look like a fish bone. And, here the it is graphical way of representing the cause of a problem relating to the cause of a problem and it actually determines the actual cause and what the effect is. So, that is why it is quite useful.

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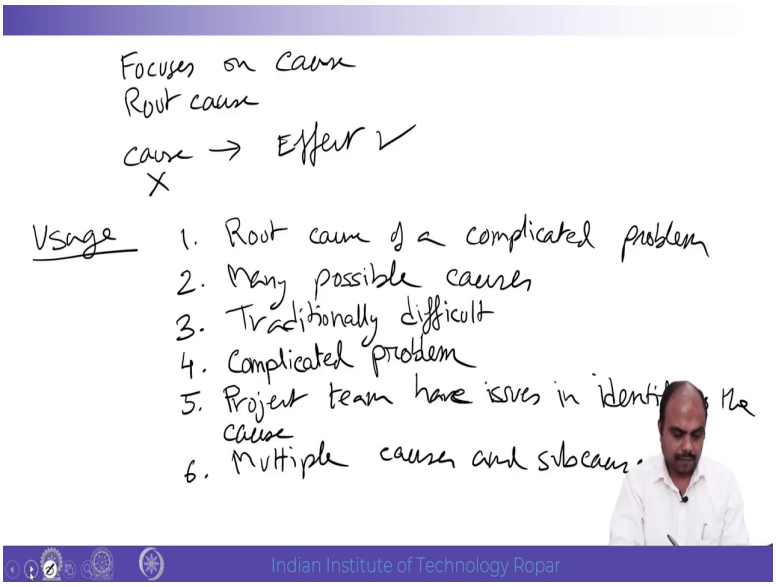

So, it actually focuses on cause and it actually helps us to go to the root cause. And then the main intention is to you know work on this root cause and then change in such a way make a may get a solutions and then remove this cause. So, ultimately, we are getting an improved effect or solution. So, cause to eliminate and then we are going to get effect and which we need.

So, when to use it? Usage – it is used especially to go to the root cause of a complicated problem and then it also use when there is many possible causes. And traditional way of finding out this is the cause or this is a it is very difficult sometimes. So, then we can use this technique. And, then the problem is complicated problem.

Then the project team may have issues in identifying the problem. And, there may be multiple causes and there is also sub causes. So, causes and then multiple of them is there. Then we should use this kind of diagram.

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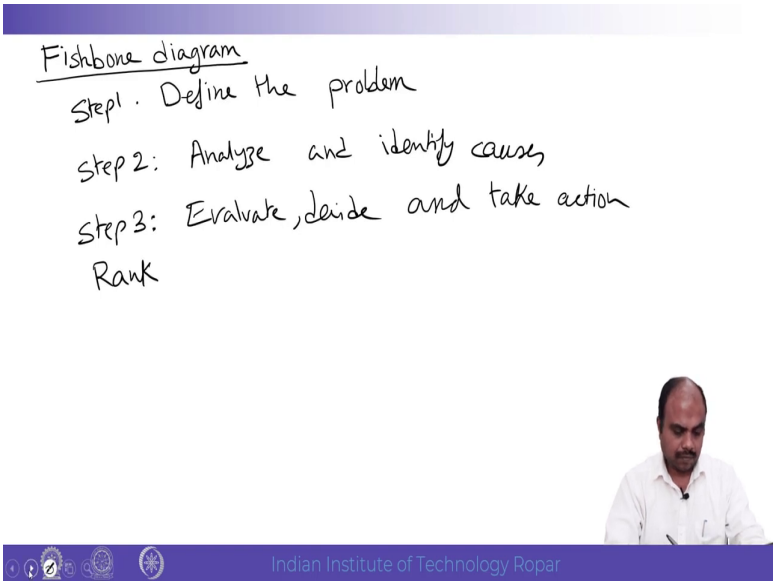

So, now we are going to learn how exactly to make. So, fish bone diagram we write it again. Step 1 – define the problem. So, this is the exactly what is the problem is. Then, step 2 is analyze and identify causes. Then, step 3 – evaluate decide and take action. Then of course, rank.

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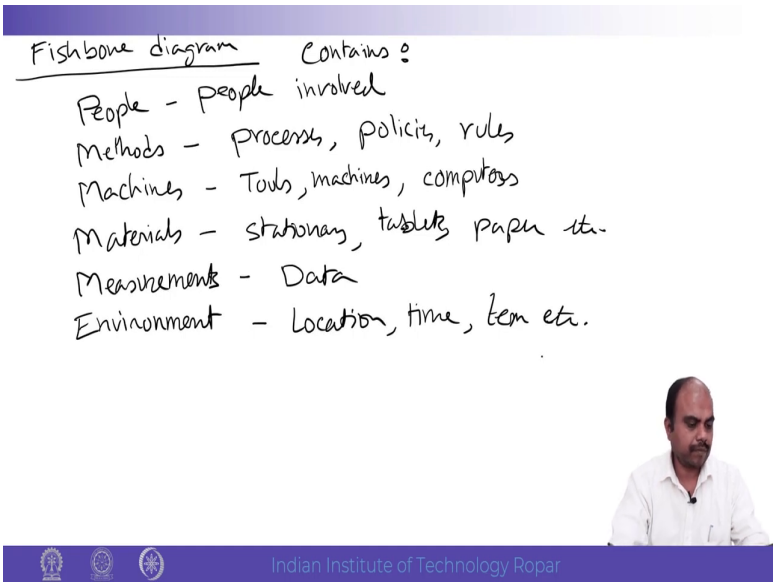

Now, the constituents of it. What this contains? One is people. So, people involved. Then methods – these are process processes, then policies, the rules etcetera. Then machines – these are tools, machines, computers may be etcetera. Then materials – these are maybe stationary, then tablets, then paper etcetera. These are examples. Then measurements –these are data which is generated which can be also evaluated later on. Then environment – these are location, time, culture, temperature etcetera.

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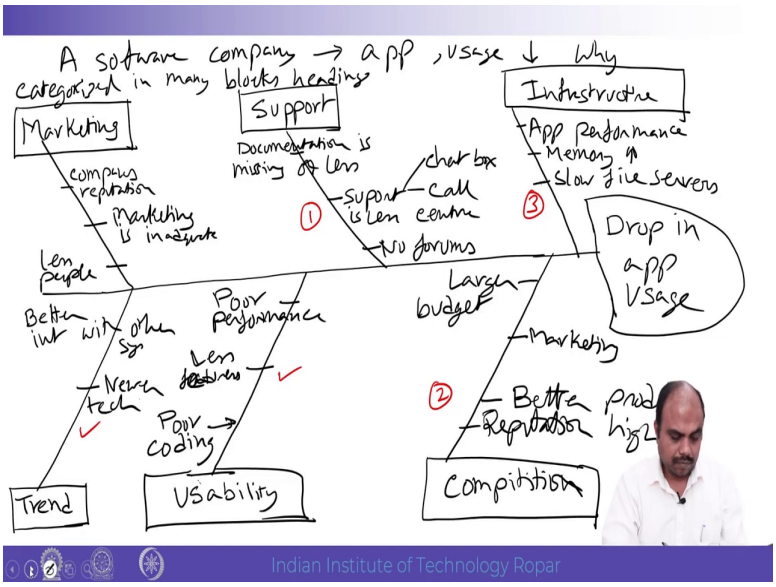

So, now let us take an example of the application of fish bone diagram. So, take for example, a company is there. A Software company is there a. They made a app and this was app was running well for some time, but then usage are really really reduced. So, they want to find out why the usage is reduced. What causes it? So, they wanted to find out the reason behind this effect.

So, now we will have a fish bone diagram. First make the middle one and then here we are going to write drop in app usage. Then we are going to make something like this. So, these experts mean within the company, analysts, they try to find out what exactly the root cause of this problem is and they have segregated it. So, they categorized into many blocks or headings. So, and then we want to see each of them in more detail.

So, first is some of the people believe that it is a marketing. In marketing people are telling that company reputation is not that great. Somebody will be telling that marketing is not enough. Then, they are telling also that there are also some other issues in the marketing – less people.

Then the another set of people who are who also believe that support is the issue. So, here support is a lack of documentation is on missing or less and then they also telling that support is less. Support in some in terms of chat box, in terms of call centre and then there are no forums also. You have seen some of the website using lot of forum.

There are another set of people or within the community people, this group believes that the infrastructure is not so good. In infrastructure basically what we have found out what people has found out that the performance is not that great, app performance. It takes lot of memory. Then there are five servers also which are slow.

Then they also found out that another thing is that which is causing this trend and now users want better integration with other systems. And then they also need more new technology newer technologies. And, then there are among these people who are assessing this one, they also believe that usability is issue – usability of this app. So, they say it is poor performance. They also say that it is less having less or not so good features and then they also say poor coding.

But there are certain people of the organization they believe actually all this things are fine, but then competition is also high. In competition they are telling other competitor having larger budget and they have more aggressive marketing. And their products are better and reputation is high. So, with all these things we have seen so, this is an example of how this analysis has been done.

Now, the people marketing people they can actually find out ok maybe this has some priority maybe this is maybe one and that is they want to have better support, they want to have better products maybe and then maybe the memory need to be and then file server need to be

enhanced and better. And then here other things also need to be taken care. Then they can prioritize and improve it according to the need of the user.

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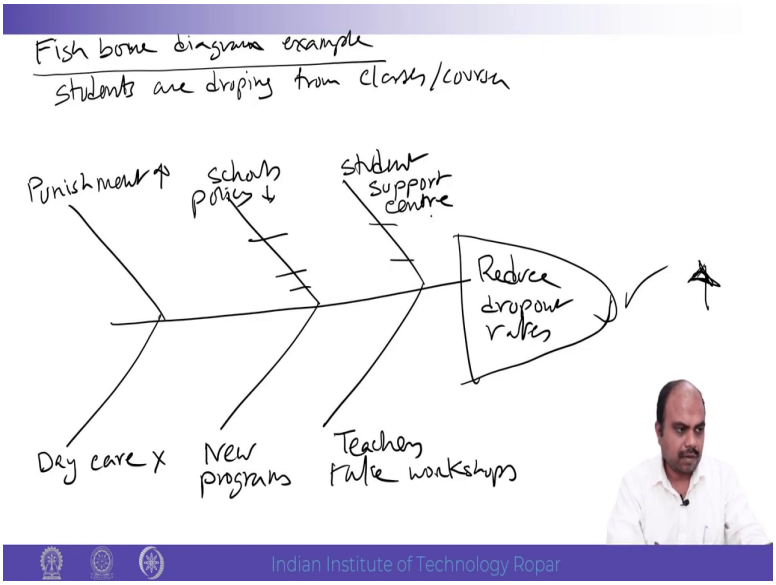

We are going to go for another example of fish bone diagram. A school is finding out that there is a drop in their students who are enrolling. So, students are dropping from the courses. Now, they are finding out fish bone diagram. Now, instead of taking why the student dropping they wanted to improve the rate which is like taking the courses number of courses most students will be enrolling. So, instead of taking a they wanted to make it positive that reduce dropout rates. So, this is the ultimate this is the aim of the work.

So, what is found out the people students what the school has found out that there is too much of punishment, it is pretty high. And of course, details they can find out this is the overall thing. Then schools policy is not that great for diverse group and student do not have support

centre. They also found that there is a for smaller for small kids they do not have to take care. They also found that committee has to make new programs. And then teachers need to take workshop to support the students.

So, they have found that this is small a very simple analysis that all these things they if they can do then they are going to they have to increase this reduce this dropout rates and then the school will have more number of students. So, this is a very simple way of analysis. And, for each of these they can go for detail understanding of the reason.

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Now, we will be learning about mind mapping.

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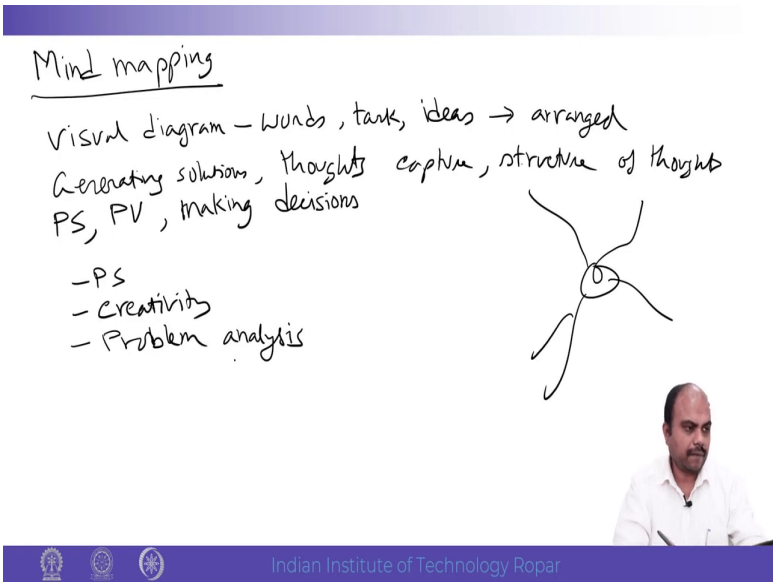

So, it is like this something like. So, mind mapping is a basically a diagram which is used to represent, it is a visual diagram. This is actually it represents with words, task, ideas and it is arranged. And, this is basically it is useful in generating solutions and way of thoughts, their structuring and then it is also using problem solving, problem understanding, making decisions. It is using it is used for many applications.

Problem solving, then it is also used for creativity, it also problem analysis, pay for the applications.

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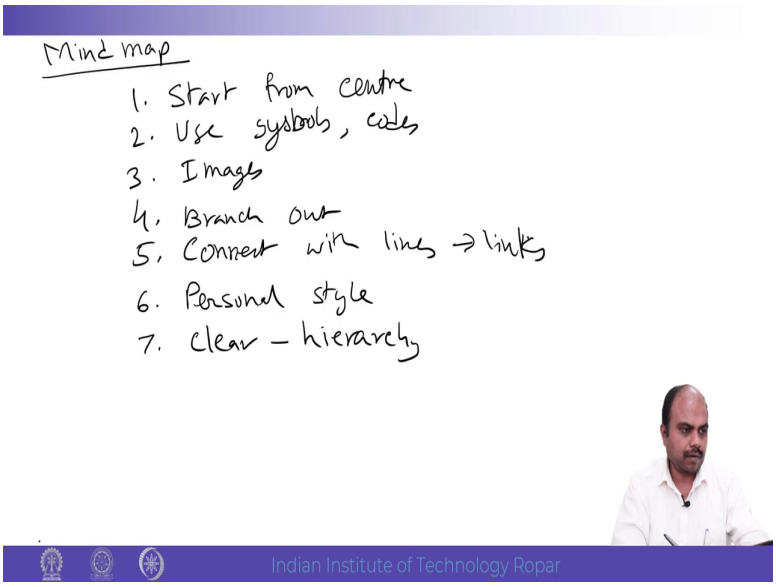

So, now how to do mind mapping? First you start with the same start from centre and then you can use symbols, codes. You can use images and from this you can branch out basically. There are lines, connect lines. This is these are basically links and you can use personal style also and it should be clear and hierarchical.

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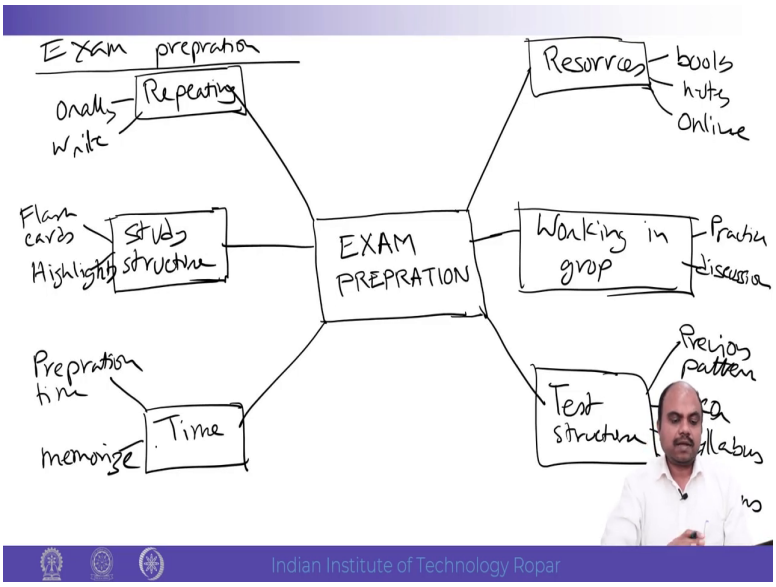

So, let us take an example. Student want to prepare for examination. So, what are things which are required for examination? A simple example. Exam preparation: So, The main intention is exam preparation. So, first thing is for exam preparation – what is required. Resources is coming to mind – books, notes, then online material. Then one can even think of ok working in group is a good idea so that if anybody is having doubts can be clarified with the other students with other students.

Then one should also know what is the pattern of examination – test structure. So, you can see previous patterns, then it could be MCQ, what is the syllabus, you can even think of like problems. And when somebody is practicing one should be practicing multiple times, that is repeating. One can write orally, one can repeat orally or write multiple times.

And then there are certain methods also one can use – study structure. There are some certain students are there who like these flashcards, there are certain students who like highlights. So, there are various ways of doing things. And then most One of the most important things is planning – time management. So, here we can see that you know that preparation time and then memorize.

So, here like this you can go on creating this mind maps and that is going to give an indication how exactly things are required and what are the fixed things are in all things are required overall we will have a indication of the requirements and also we put everything in place which is required for this particular problem.

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