Functional and Conceptual Design
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Lecture No. 26
Concept Selection

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So, we will start a new topic today, that is the Concept Selection, this is going to be the last topic in this course, and this will discuss the Selection of the best concept from the concepts we generated using Concept Generation Methods.

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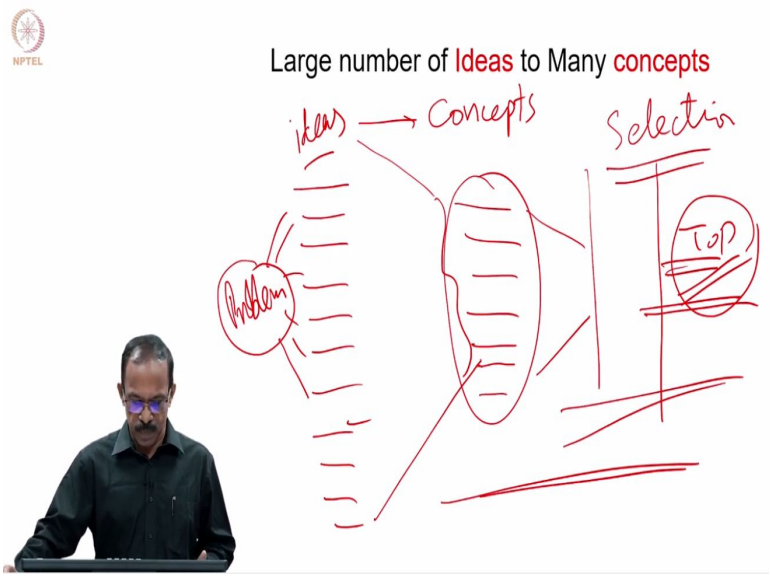

As you know, there are a large number of ideas that you will get once you do the concept generation exercise, that is Brainstorming or 6-3-5 or TRIZ methodology. You can generate a large number of ideas. So, what will happen is that you will get a large number of ideas to solve a problem. So, you have a problem to be solved and then you will find that there are so many ways to solve it.

You will be having a large number of ideas to solve this problem and these ideas will come from what we discussed as Idea Generation Exercises. Now, we will convert these into concepts. So, you need to convert these into concepts and as I mentioned the team will work together and look at these ideas and then see how this can actually be converted into few concepts.

So, some very good concepts that can actually solve the problem. But, these concepts, they may be around 10 to 15 to solve one problem, then we need to check which out of these 10 or 15 will be the best solution or which one can be taken as the best solution to take it forward and then make a prototype and testing.

And we need to have some kind of strategy in order to make sure that the concept that we are selecting is based on some kind of performance criteria that we identified in the product or when

we started the design process, we identified some kind of performance requirement. And based on that, we need to see out of these concepts, which one will be the best one.

So, we will try to, again narrow down this and then since you have a large number of these concepts, you would not be able to do a very thorough analysis of each and every concept and therefore, we will go through some or two stages in doing this and then get the selection. In the selection process, we will be having few stages, but these concepts will be narrowed down to a small number of points and then we find out the top 1 or 2 concepts.

So, this is the way we need to get into the final concept to solve the problem. So, this is the way how we will be moving forward from the ideas to the top concept. Concept selection is basically to select the best concept out of many possible concepts to solve the problem. And at this stage you will see that all these concepts are good and they are all capable of solving the problem and all seem to be practical, logical, satisfies everything, but still there may be variations in each of these concepts.

And then therefore, we need to make a very informed decision on which one will be the best concept and that is basically the concept selection process. We will see how we can select the best Concept from a list of feasible concepts to solve the design problem.

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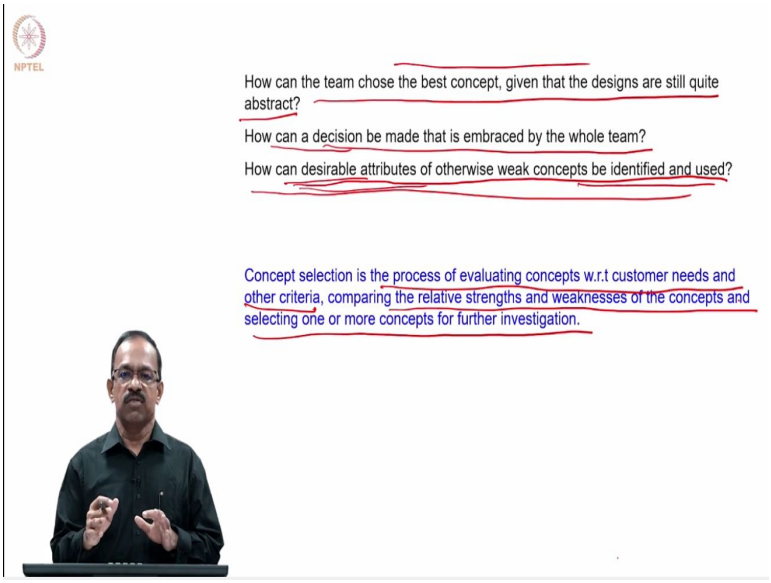

The objective for the team is to choose the best concepts given that the designs are quite abstract. We still do not have a very detailed design, they are again at a very abstract level, we have not gone into the details of the material properties, machining requirements and all those things are not really taken into account. But we have an idea or we have some kind of understanding of how these concepts can be implemented.

And under that situation, how can we choose the best concept is the question. And how can a decision be made that is embraced by the whole team. When you have a team of people who develop the concept, each one will be having a preference for one or two concepts over the others. This may be mainly because of their contribution into developing that concept, or they felt that is the best way to solve the problem.

When you are choosing the best concept, you cannot have one from each team member. You need to have a consensus among the team members saying that, this is the best that we can take forward. And how do we actually do that? How can we ensure that all the team members agree on this concept to be taken forward. And another important point is how can the desirable attributes of otherwise weak concepts be identified and used?

When we have many concepts, some of them will be very good in a particular aspect, but they may be very bad in some other aspects not intentionally, but because of the way the concept generated and the idea got converted to concept. There may be some weak points in every concept. So, the question is how we can use the desirable attributes of other ways weak concept

And then make use of that, those particular desirable attributes to improve the concept. Either the same concept can be improved by addressing the weakness or the disabled attribute of one concept can be used in other concepts to improve that concept. So, how can we do that in a systematic way also addressed in the concept selection process? So, concept selection is not merely choosing the best one, but looking at the concepts and trying to see how the concept can be improved to get a best concept.

So, it is not purely a selection, it is more of improvement of the existing concepts and then choosing the best concept. We will see how this can be done. The concept selection is the

process of evaluating concepts with respect to customer needs, and other criteria, comparing the relative strength and weakness of the concepts and selecting one or more concepts for further investigation.

That is the concept selection process, where we evaluate the concept with respect to the customer needs as well as other criteria that we identified and then ensure that the relative strength and weakness of the concepts are compared. And then select one or more best concepts to take forward is the concept selection process.

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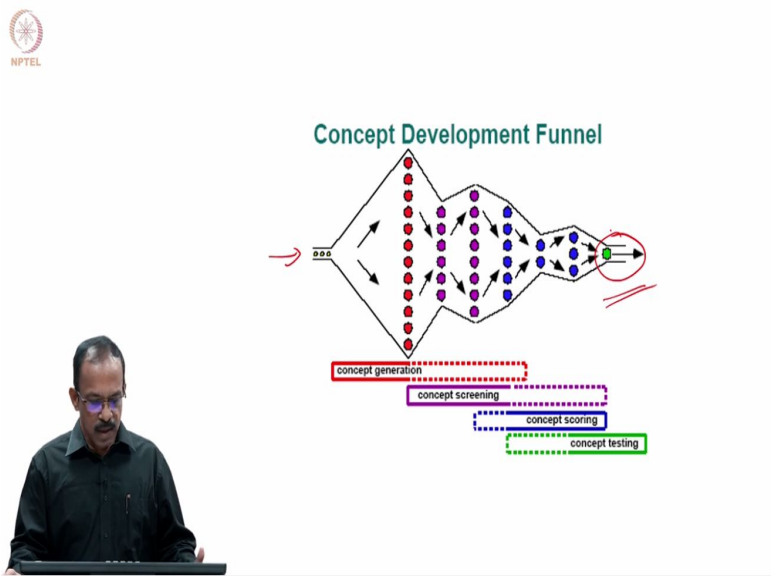

So, this one I already explained. You have this problem coming and then you have a large number of ideas and then you do some kind of analysis that converts into concepts and then these concepts will be sent through a selection process and finally, you will get the best concept out of this. So, you can actually help multiple stages in this one. We will discuss these stages by how we actually get into the best concept from a large number of concepts developed using the idea generation and the concept generation process.

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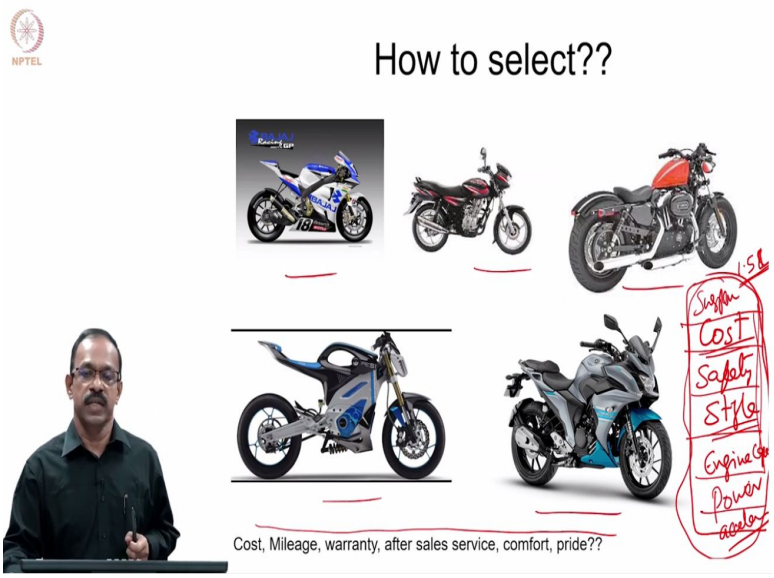

To explain this, let us take a very simple analogy of what we normally do when choosing something for example, you want to buy a bike and you have a lot of choices to buy and based on something you need to make a decision which one you should buy? So, for example, suppose you have this kind of 5 model bikes available in the market. You want to buy the best bike that is possible for you.

It is not that you want to buy the best of everything, because you will be having your own limitations. You may be having some criteria or some preferences. So, you have to look at that preference and then decide which one is the best for you and how we normally proceed with this. What we do is we actually look at the bikes available and then prepare a list of bikes that are available in the market for you to buy.

And then you look at what your preferences are. You have some preferences and you go up for a bike and naturally any, any selection process follow the same method and here the preferences you can actually say, probably the cost will be a constraint or a preference you know that you have a, a cost limitation you say that, I do not want to go for anything more than 1.5 lakhs.

So, probably that may be the one criteria that you may be having and then you are looking for safety. So, you need to look for which one is the safest by bike depending on the knowledge you

have about the bike and safety issues as well as the design which leads to safety. Another one may be the style so you would like to have a good style okay either a sport style or an adventure bike style whatever it is.

So you have some preference for the style of bike and then you have some preference for the engine capacity. So you do not want to go for engine capacity which is less than 150 or 200. You would like to have more than 200 that may be your preference or you would like to have it as less than 200 whatever it is, so you have some engine capacity and then you may be having something on the power or if you are more tech savvy then you may be, what is the actual acceleration, maximum acceleration possible. And then maybe the type of suspension being used.

So, this may be the criteria that you may be having not All, but few of these criteria you will be having. Now, you need to decide because each one will have its own characteristics that may be very costly, but will be very good in all the safety and other aspects and engine power may be very high but some may be very low cost but it may not be meeting your other performance criteria.

What do you need to do you need to each bike you take and then you see analyze with respect to these criteria, how each one is performing and then you can actually prepare a chart and then see okay which is the one which actually scores the highest amongst the bikes and if that is the one you can afford, then you decide, let me go for that bike.

In a practical scenario, in our day to day life, you may not be doing this as a systematic process we will be all doing all these, in our own calculation our own ways and then decide let me go for this and this is the same thing what will happen when you want to buy a Laptop or you want to buy a new Mobile Phone, you will be that we are there are a lot of choices available for you to choose from, you need to make a choice based on the criteria you have.

That is the importance you need to identify what is the criteria you have in buying a Bike or buying a Phone or a Laptop, it is the same applicable to the concepts also. So, when you have 10 concepts, 10 or 15 concepts, you need to know which one is the best and it should be more of a

very systematic procedure. It is an objective one which anybody can understand or you can explain to anyone why you choose the particular concept.

That is why we need to have a very systematic process in developing and selecting the best concept. So, let us see how this can be done. So, this is the way we normally do. So, the first thing is to have a selection criteria to compare the products or the concepts that are available. In any selection process, we need to have some kind of criteria based on which we can make a choice. That is the step that we need to have

As I mentioned cost, mileage, warranty, if after sale service, comfort, pride etc will be the can be the criteria. So, it did not include the Mileage and Warranty and other things, but you can have any criteria that you like to have. This is the normal process by which we choose products or we make decisions to buy products or sell products or whatever it is. So, whenever we had to make a choice from multiple options available, you need to have some kind of a standard criteria to compare these options and then make a decision.

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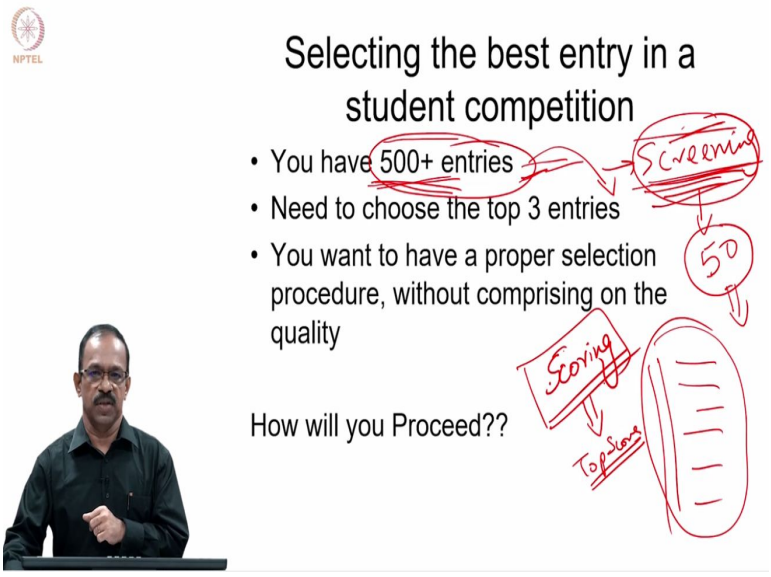

Similar is the case with when you are part of a competition, I mean you are organizing competition as part of the student festivals, most of the colleges will be having student festivals,

technical festivals and you conduct a lot of competitions in the as part of the festival. Now, suppose you are conducting a competition and you are getting around 500+ entries.

Now, you need to choose the best out of these 500 best or the best 3 you want to choose. So, if you want to compare all these 500, it may be difficult for you to compare all the 500 based on a number of criteria. Whenever you have this competition you decide the price will be based on these many criteria. So, you will be having some 5 or 6 criteria or more criteria in choosing the best concept or best entry.

But when you have 500+ entries or you have a large number of entries, you may not be able to do all these criteria analysis in a very detailed way. And therefore, you would like to bring down this to a smaller number, so, that you can do a very detailed analysis of each and every entry. So, that is what you do. You will have a preliminary evaluation of this.

May not be using all the criteria and you may not, you may not go into the details of each criteria, how much it scores and how much is the variation between different teams, you will have a very simplified form of analysis in order to bring down this to a smaller entry. And that is normally known as a Screening Process. So, we will do a screening of the, All the entries and then say that out of 500+ or no, we have only some 50 good entries, 50 or 100 depending on how you want to go.

So, you will see that I have only you can actually bring down this to a very smaller number. So, that all these 50 can be evaluated in a more objective way so that you will be able to choose the best. So, the first stage you do a screening process to reduce it to a smaller number where you can have a better evaluation and this screening could be more on not necessarily to be a very objective, you can have a very subjective evaluation, whether it meets the requirement yes or no kind of evaluation can be done and then based on that you can bring it down.

For example, if you have 500+ entries, so, you might have decided given some conditions under which the entry can be chosen, for example, size or shape or weight or something like that, we can have a look at the entries and then see whether they actually meet the requirement. If they

are not meeting the requirement, you can immediately eliminate it. So that way you can vary, you can quickly bring down this large number to a smaller number.

And then you go to a more objective way of looking at it and then try to evaluate each and every entry and then decide which one is the best. So, there you will give some marks for each one of them, you give some weightage for each criteria and then find out which entry is scoring the best and that will be chosen as the best entry for the competition. And that stage is normally known as a Scoring stage.

So, you do a scoring of the entries, and then find out the best one based on the top score, top score. So, which one is getting the top score will be the best entry and like that, you will be choosing the top 3 entries in a competition. So, in any selection process, you need to have different stages in order to make sure that we can bring down the large number of entries to a smaller number and then analyze this small number of entries with a very focused and objective evaluation and get the top entry selected.

And so, these stages are known as Screening and Scoring. In product, In the concept selection process also, we go through these two stages in order to choose the best concept from the large number of concepts we do a preliminary screening to find out which are the potential concept that can be taken forward, you do a quick screening and then select the top 5 or 6 concepts and then do a detailed analysis of scoring and then take the best concept that is the process we follow in the concept selection

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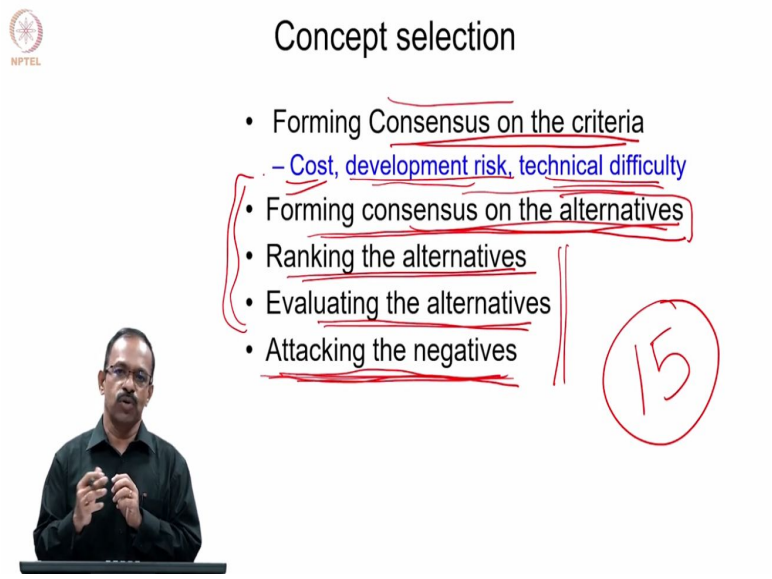

In order to do this, as I told you, if you want to do a selection process, we need to have some criteria based on which we can evaluate the concept. So the first process in the first stage in doing the concept selection is to decide on the criteria. All the team members should agree that these are the criteria by which we can actually evaluate the concepts. And that criteria can be anything depending on the customer needs or the design specifications or whatever the team feels appropriate can be taken as the criteria.

So, it can be the cost, cost of the product or when you develop the concept, how costly it will be, and the development risk, knowledge of the availability of technology and the risk involved in developing the concept and technical difficulty like anything. Depending on the product you can have any number of criteria, but of course, a large number of criteria also may be very difficult.

So, your team has to decide what will be the best possible criteria that can be used for evaluating a concept. It depends on the, the product and the concept that you have at hand and the design team has to come to a consensus. So, everyone should agree on the criteria that is to be used.

And then forming consensus on the alternatives. Alternatives are the available concepts that you have supposed you can use after converting the ideas to concepts you have reached on many

concepts. So, suppose you have around 15 concepts, and if everyone feels that all these 15 are good and it can be considered for the next stage you can go ahead.

Otherwise you can have a decision based on the team's own understanding. If everyone feels that a particular concept is not at all good and it may not be necessary to take it forward you can actually eliminate that. You can actually bring down this to 15 or 12 or 13 depending on the team's consensus. That is why the team also should have a consensus on the alternatives concepts available for the performing the design problem.

So, have a consensus on the criteria and consensus on the alternatives and then rank the alternatives based on the process or you can, you need to, you have the alternatives and you have the criteria. Now, using these criteria, rank all the alternatives, give some marks and rank all the alternatives and evaluate the alternatives based on the rank it has obtained and then attack the negatives.

Attacking the negatives is that if you have a concept which is having a lot of good attributes, but it is going bad because of a particular alternate or a particular feature that is the negative feature of that particular concept see whether that you can actually modify that particular feature to make it improve the concept so, that the concept can be improved. And then you can see how it actually ranks it in the alternatives.

That is basically the attacking the negatives, it can be either combining two concepts, if the concepts are having complementary features, positive features, and you can combine them and then improve the concept or you can take the good attributes of one of the concepts and then add to something else some other concepts or you can attack the negative attribute of a concept by improving that and making it better.

So there are multiple ways in which you can attack the negatives in a concept. It is not only just ranking the alternatives and going through the ranks, but it is attacking the negative also. So, this can be done, this part of the ranking, so as I told you, you cannot have the same kind of approach for and you have a large number of alternatives or a smaller number then a large number, you do quickly bring it to a smaller number.

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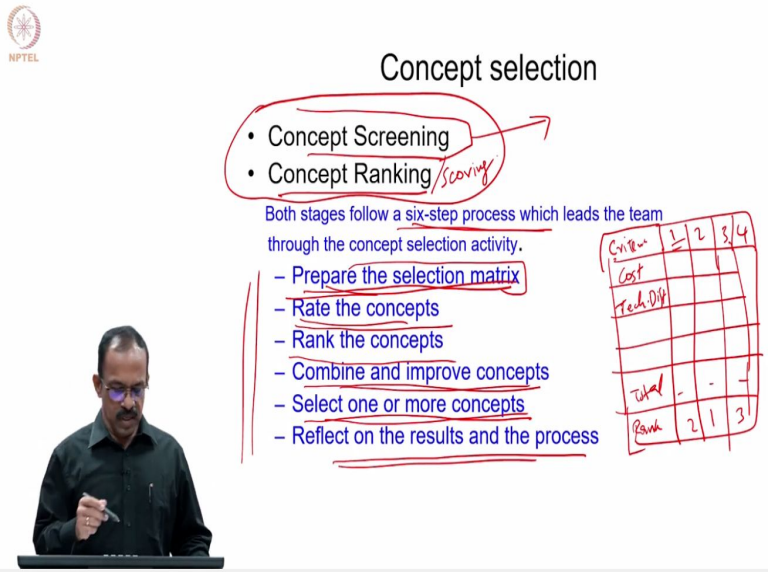

We need to go through two stages in this and as I told you, they are the Screening and Ranking or Scoring. So Concept Ranking or Concept scoring. These are the two stages in the concept selection process, we call this Concept Screening and Concept Ranking or Concept Scoring.

In both the stages the purpose is to get the best out of the set available with you as an alternative set of alternatives available with you. So, in the Concept Screening, which is a process, where we try to bring down the large number to a smaller number, we go for a screening process and from that within the large smaller number, we go for a more objective evaluation of the alternatives and get the best that is known as the Concept Ranking or Concept Scoring.

And both the stages of the steps involved are almost the same. So, we have a, a 6 step process which leads the team through the concept selection activity. So, whether the screening or ranking we do the same stages, except that the sum of the stages will be having a different way of handling the ranking process.

The first one is to prepare the selection matrix. The selection matrix is the criteria and the alternatives. So, these are the criteria against which my concepts are to be evaluated. So, this will be the criteria and then I have the concepts 1,2,3,4 etc.

And then each concept will be evaluated against these criteria like cost or of technical difficulty etc. So, this is known as the matrix. So, you have a selection matrix which has got the selection criteria and the alternatives listed. And then rate the concepts based against the criteria. So, each one can be given the ratings.

For example cost one, what will be the rating? Cost terms of this is high cost or low cost you can have some kind of rating here that rating depends on the team whether you want to give a numerical value there or you can give some kind of a symbolic representation like 5 star, 2 star, 3 star like that, that actually depends on the way you want to do it, but that is the way how you do the rating of the concepts and then rank the concepts.

So, based on the ratings you say, what is the rank? Or you can say the total score you can find out and then you can say rank 1, 2, 3 etc. So, that is the way how you rank the Concepts. And then, after ranking you just check whether anything can be combined to improve the concepts.

Is there a way to combine some of the concepts or improve some of the concepts by attacking the negatives and once you do that, you may be getting a better concept and again see what will be the rank of that one and then based on that select one or more concepts for the next stage and reflect on the results and the process and then look at the whole process and then see whether anything is missing or if you made a wrong assumption.

On looking at all those things, you will be able to get the final selection of the concept. So, this is the process that we follow in both the Screening and Ranking of concepts. I hope you understood this. So, this is the way we proceed with the process. Now, let us see the first stage where we will see the concept screening, how is it done?

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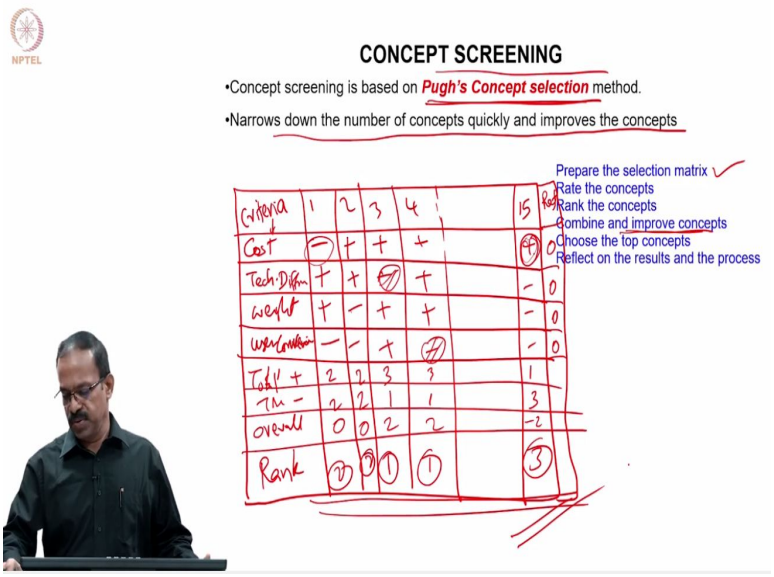

And in concept screening, as I told you, the idea is to bring down the numbers to a smaller number for better analysis. So, in the first stage, we do more of a subjective evaluation not giving any objective values, but we do a subjective evaluation and then bring down the large number of concepts to a smaller number, that is the first stage concept screening. And here we use something called a Pugh's Concept selection matrix.

Pugh's method is commonly used for this kind of analysis. So, we use the same method Pugh's concepts for Pugh's method for concept selection. And it actually narrows down the number of concepts quickly and improves the concept. So, that is the idea here, we want to have a very quick narrowing down to a smaller number and you have a large number narrowed down to a smaller number.

And how is this done? So, as you can see, the first thing is to prepare the selection matrix. So, what do we do? We prepare the selection matrix. So, we prepare a matrix, selection matrix and we say that again this is the, these are the criteria. So, as you know these criteria should be selected based on the consensus of the team members and then here, so, here these be the criteria and the concepts or the alternatives will be given here.

So, you may be having 1, 2, 3, 4 etc assume that there are 15 numbers of concepts you have, 15 concepts you have and you want to bring down these to a two top five or top six concepts that is the idea. Now, the criteria can be given here you can have the criteria and then you can give the ranking. So, I say criteria one is cost, technical difficulty, weight something like that user a user convenience something.

It depends on the, this actually comes from your customer needs as well as the design criteria that you had arrived at during the specification development process. So, from there you can actually take the criteria. Now, we look at each concept, suppose you have 15 concepts and each concept you need to see what should be the value given. So, in this case, since you have 15 you want to compare these 15 numbers of concepts.

So, one way to do is to have a reference, suppose you have similar products already available in the market, then we say that okay there is a reference product to compare and then we say that I mean you can compare these 15 concepts against an existing reference. Suppose, there is no reference available, then we can take one of these concepts as a reference and then evaluate with reference, with reference to that concept. How are the other concepts performed?

That is the way we can do the Relative ranking. We want to get a relative ranking of these 15 concepts. And one way to do this is to refer to an existing product or one of these can be taken as a reference and what we do, we give the reference say as 0 rating. So, we will say that the reference is always given 0 and then with reference to this reference, we will check concept one is it costly or less costly, so, we want it to be less costly actually.

We check whether the concept one will be much more costly than the reference. If it is costlier than give it as a, we give a negative value for this, if this is cheaper then give it as a plus. So, like these you can give a plus or minus depending on the cost of the new concept or the projected cost based on the new concept.

Whether it will be more costly or less costlier compared to the reference will give it a plus or minus that is the way how the Pugh's Concept selection matrix works. Similarly, the technical difficulty you will see okay the reference technical difficulty is 0 and what will be the difficulty

of the first concept you will say, this will be much more easy there is not much, not much technical, technical difficulty compared to the existing one and give it as plus, give it as a plus minus plus etc.

This way you will give each one of some kind of plus or minus compared to the existing product, the reference. So, as I told you, if the reference is not available, it is a completely new product, you give this 15 as 0 each one you give it as 15 you give 0 value and then compare others with respect to this 15. So, whether the product is existing or not is not at all any major issue because you can always compare it against the one of the concepts that you had developed.

The idea is to get the rate of your ranking. So how the other concepts are performing with respect to the reference is the main requirement. So you will be able to do this. So like this, you give the plus minus to all those Alternatives or the concepts and then what we do we will find out what is the total, total value. So you can say total +, total - and overall value. So, you can see that this is here and you can see that there is 2 '+' and 2 '-', 2 '+' and 2 '-'.

Let me give some kind of difference. So, this is 2 '+' and 2 '-', and this is 3 '+' and 1 '-', this is again 3 '+' and 1 '-'and this is 1 '+' and 3 '-'. So you will get the overall as 0, 0, 2, 2, -2. So, that is the way how you get the score. Now you can give the rank based on this,

If two of them are equal, you can either give it as 1, then it will be 2 and this will be 3. So, this is the way you give the ranking. Suppose they are equal, having an equal score give the same rank, otherwise give the difference. So, in this way, you will be able to get the ranking of all the concepts and based on the rank you can choose the top 5 concepts from the 50.

So, but we do not directly choose the top 5 we will look at if there are any concepts which can be improved. For example, you can see this concept may have one positive thing here, this concept has 1 positive and other 3 negatives and this feature and this cost, this product it is because of the cost only it has become negative.

So, what is the feature that actually makes it positive? Can we change I mean use this feature in this product in this concept to improve its rank or if there is any complimentary one for example, this one this there are plus here and there plus minus here, this minus and this minus now, if you

combine these two features by eliminating these two minuses then you will be getting a better concept.

So, this is the way we need to look at the negative features of the concepts and then combine them or modify them to make a better concept that is the combined and improved stage of Concept Screening. So, concept screening is not only looking at the ranking but it is trying to find out the feature of the product, concept is, what feature of the concept is making it attractive or not attractive and based on that you can modify the concept and make it a better concept.

So, it helps you help the design team to improve the concept based on the criteria. So, that is the first stage of Concept Screening and this is known as de Pugh's Concept selection method. So, we use the Pugh's Concept selection method in the Screening stage.

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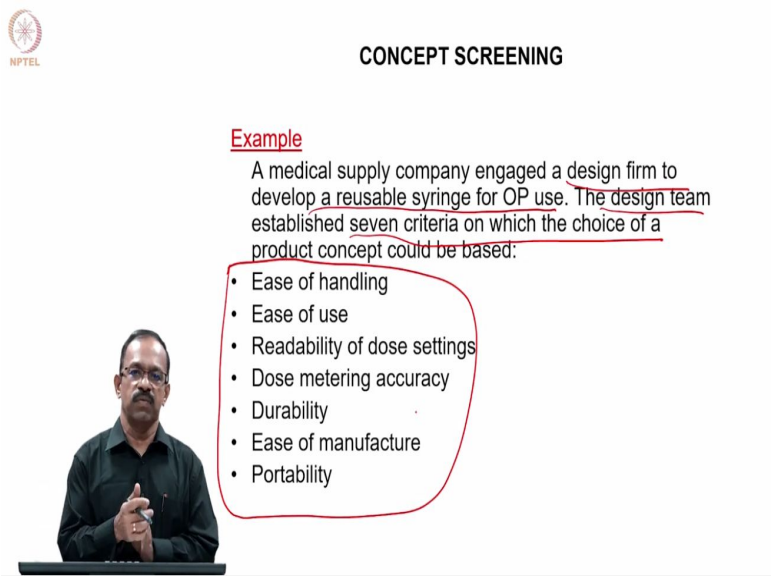

Let us take the example, one example for a Concept Screening. So, a medical supply company engaged a design firm to develop a reusable syringe for outpatient use. So, this is the design problem given to a company and they wanted this supply company to want a reusable syringe, not a disposable one, a reusable syringe for outpatient use. The design team established 7 criteria on which the choice of a product concept could be based. So the design team had 7 criteria against which all the concepts can be evaluated.

And these 7 criteria came again from the customer requirement as well as the design team's understanding of the product. So the first one was, Ease of handling, how easy it is for the medical professional to handle it and then the ease of use, how easily it can be used and then readability of dose settings.

So, you need to set the dose, you have to check how easy it is to read it then, Dose metering accuracy and then durability, ease of manufacture and portability. So, these were the 7 criteria identified by the design team. Ease of handling, ease of use, readability of dose settings, dose metering accuracy, durability, ease of manufacture and portability.

So, whatever the concept you develop, it will be evaluated against these criteria and if it is, then you will see which one is the best one which meets all these criteria. So, that is the way the design team wanted to evaluate the concepts.

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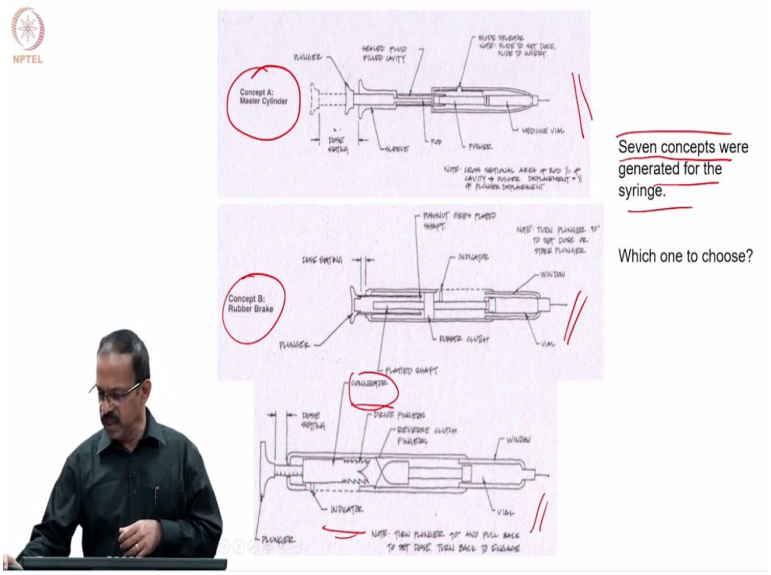

And they developed many Concepts and again they developed 7 Concepts of course this 7 is just, for example, we have given s7. Team can actually have much more than 7.

So, 7 concepts were generated for the Syringe. So, you can see each one is shown here, taken from the textbook. So, concept A is a master cylinder type, concept B is rubber brake model, and

this is the concept C which has got a kind of a dose setting here and a conveyor kind of thing. It is an indicator connector, it is a connector here and an indicator. This is the C concept C.

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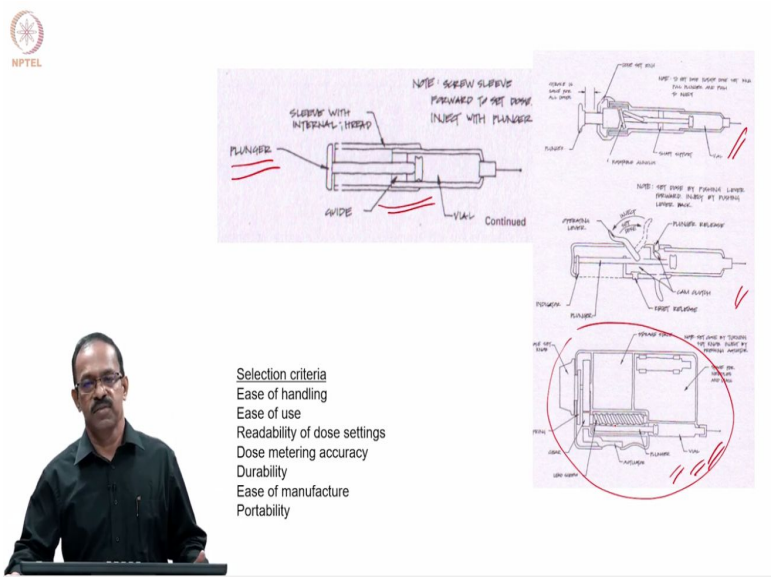

Then you have the concept D with the plunger here and then this is the E, F and G. So, you have 7 concepts developed by the design team. And all these 7 Concepts actually work well and they are all good concepts and actually feasible can be practically implemented and there are no issues with the concepts per se.

But then the team wants to know which one will be the best one as though all the 7 look fine and they will work then we want to select the best concept out of these. Guess each one has got its own features. For example, you can see this one seems to be a bit bulky compared to all others, but then there will be some advantages of having this particular design.

And that is why the design team has gone for this. Sometimes the cost may be very less or ease of dose metering accuracy may be good. So these are the advantages that this design should have. So, they want to have a very objective and very systematic way of selecting the top concept. So, the first stage is Concept Screening, they want to bring it down to a smaller number and then do the second stage of Scoring.

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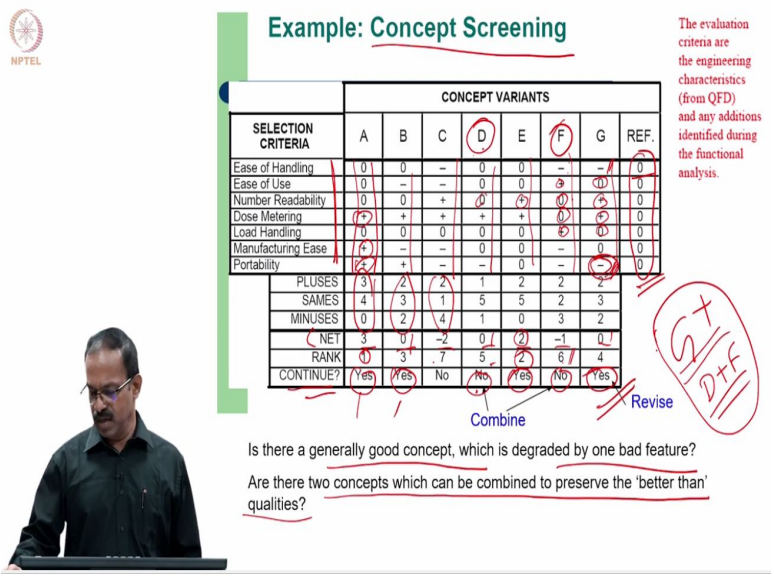

Now, if they go for the Pugh selection method, the Concept Screening can be done based on that and you have this criteria here the ease of handling, ease of use, number readability, dose metering, load handling and manufacturing ease and portability. So, these are the criteria, selection criteria, and you have the concept variants A, B, C, D, E, F, and G.

So, that is a Selection matrix. You have the variants and the criteria. So, now, based on these criteria, the concert variants need to be evaluated in the screening stage and then this is the reference they have chosen. So, they have chosen an existing syringe in the market as a reference and then evaluated all these variants based on the reference existing in the market. And as I mentioned, they will give you the ratings for each concept based on the criteria with reference to the reference product chosen.

Now, when you do that, we will see that this is the way how it can be scored. You can see the concept A is equal to the reference in ease of handling, ease of use, number readability, but better than the existing one in the dose metering, manufacturing ease and portability. So, there are 3 characteristics or the 3 criteria which this concept A performs better than the reference.

Same way you can see each concept is given a plus or minus or a 0, so, if it is the same you can give a 0, if it is plus or if it is better you give a plus verse give a minus equal give a 0 and you

can give all the concepts this rating like this. Now, you look at the total plus and minus, so you can get these values here 3, 4, 0, 2, 3, 2, 2, 1, 4 etc.

And you get this net as 3, 0 minus 2, 0, 2 minus 1, 0. So, that is the total Net value, so you can 3 is the highest. So, give rank 1 here and then 2 rank 2 and then you have 0 and both are 0 here has 0, 0, 0 there are three 0s. This is 0, this is 0, and this is 0. So, you can give it as 3, 4, and 5. Or you can give 3 equal also so you can give equal rank, then 5, 6, 7. So you have 5, 6 and 7.

Now you have to decide, okay, what to do with this one continue, you can say you do not, you do not want to take all the 7 to the next stage. So you want to take 4 or 5 or 3 or 4, depending on that team's interest in taking it forward. Probably four of these can be taken forwards. Yes, Yes, Yes. But we do not directly take it now, because we need to do the other aspect of attacking the negative.

So, you need to look at what are the features that can be improved or what are the ways in which these concepts can be improved by either combining or taking the negatives so if look at these concepts, you can see which has got a plus here and a 0 here, a plus here and a 0 here, a plus here and a 0 here, plus here and a 0 here. Similarly there, you can actually improve some of these for example, the portability is negative in this case.

So, this one is one of these is Portability. So, the last one is Portability is negative. So, because of this negative and this negative the, this concept was actually going bad, if you probably addressed these negative features, then it may be becoming a better concept also. So, you need to look at this concept based on the criteria and the rating is received, see which one can be combined and which one can be improved.

So now if you look at that, you will see. And so, the question is, is there a generally good Concept which is degraded by one bad feature? And are there two concepts which can be combined to preserve the better than qualities. So, that, that is the thing which you actually need to check with all these concepts. Now, you can see if this can be revised this minus can actually be because it is minus because of this portability.

Otherwise, it has got 2 plus points and this minus is a problem otherwise it is 0 and this Ease of Handling. So, probably, when you address the portability issue, this ease of handling also will improve that way you can actually address both these negative features and make it positive, then this will be a much better concept, that is how you need to look at it. And then if you look at these two here, here plus 0 plus, plus, and many of them are 0.

So, probably, if you combine these two, not this one, these two, so, this has got a plus 0 here and here got a plus and a 0. So, if you combine this, otherwise it is a very low scoring one. So, if you combine these and these, these two were no actually and if you combine these two features and these two concepts, you may be able to come up with a better concept. So, this is what we can try.

So, revise this concept G and then combine concepts D and F. So, D and F can be D and F can be combined to get a new concept. So, we have this Yes, Yes, Yes, Yes for, this was Yes. So, this is a Yes 1 and we already decided we can, so that this can be improved by addressing this issue and then there were 2 No's were there. So, we try to combine them and then see which one can be taken forward.

So, now, you have this G so the G can be improved so we call this as a new design as G plus. That is by addressing the Portability issue of G, we are actually addressing the Ease of handling issue also. So, you get a new concept G plus. Similarly, by combining D and F we may get a new concept. So, we call it D plus F. This way you will be getting two new concepts G plus and D plus F.

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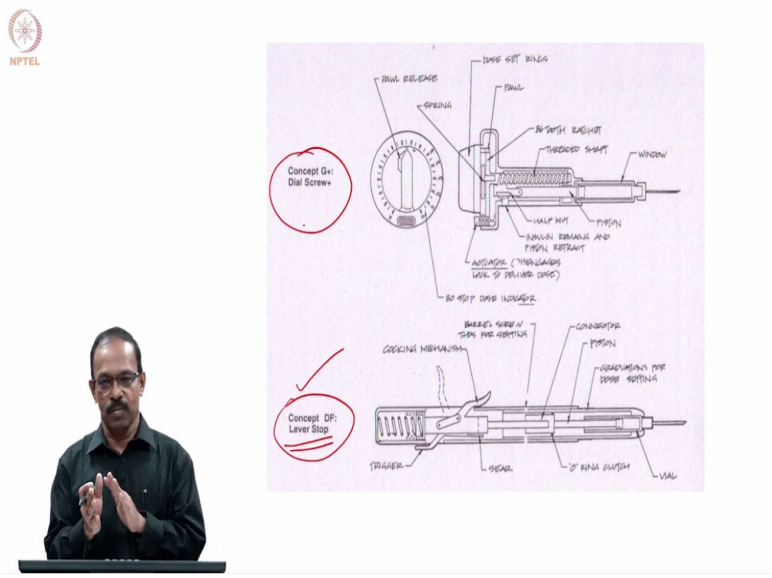

So, if you do this, you can see the G plus. So, the G original G was actually a bulky one; it was something like this. Now, by improving the design and addressing the bulkiness issue, it has become smaller and the bulkiness has gone and therefore, the ease of handling and portability improves and then combining the D and F, so D has got some good features and F also has some good features.

So, try to combine these two good features and then come up with a new product. It has become concept DF. Now, we take this to plus the previous 1, 2, 3 rank and then take it to the next level that is the concept Scoring. The first stage is Concept Screening, where we try to find out the top ranking concepts from a large number of concepts and then try to improve the existing good concepts or the other ways good concepts or concepts which have some bad features.

And by addressing that, if you can improve it, you improve it and then get a good Concept from that. And take all these concepts to the next level of concept scoring.

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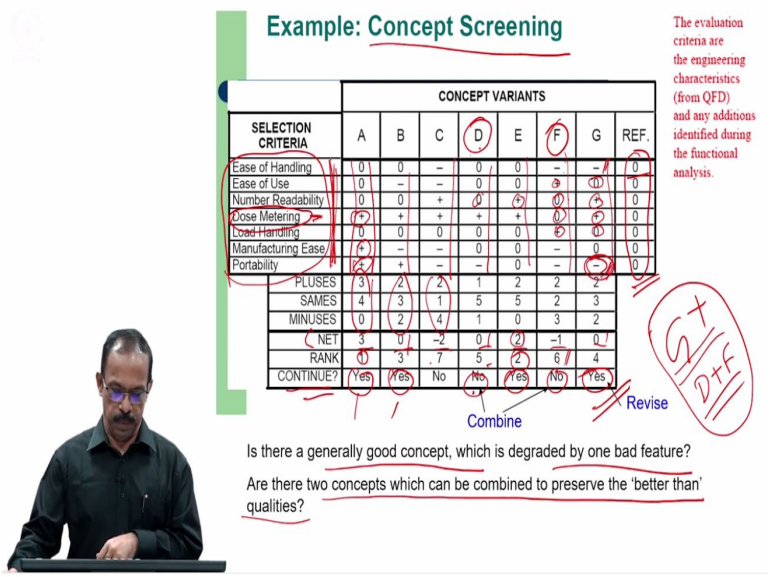

Now, if you look at the previous case of Screening, we look, we had more of a very subjective evaluation, we did not really check when you say plus how good it is compared to the existing one, just said it is good, better than the existing one.

But how much it is better or there was no quantitative evaluation against the criteria, more of a qualitative evaluation you did, again it says subjective evaluation. And apart from that, we actually considered all these to be of equal importance. We found we said or we assumed that ease of handling, ease of use, number readability all are having equal weightage that may not be true because not every all the criteria have equal weightage.

As for example, in the case of a syringe, you have need to have more importance for the dose metering accuracy because that is more important in the case of injection when you give an injection you to ensure that the, the dosage is correct and if that is not ensured, then you have problem in using the syringe. So, this should have actually more weightage compared to the ease of handling or ease of use. But to make sure to do a very quick selection process, we actually did not consider that much detail. We wanted to bring it to a smaller number based on this and then the next stage will decide to have more detailed analysis with more objective Scoring, so that is the next stage of Concept Scoring.