Product Engineering and Design Thinking

Prof. Prabir Sarkar
Department of Mechanical Engineering
Indian Institute of Technology, Ropar

Module - 07
Product Complexity, Affordability and Design Thinking
Lecture - 33
Design Thinking Steps

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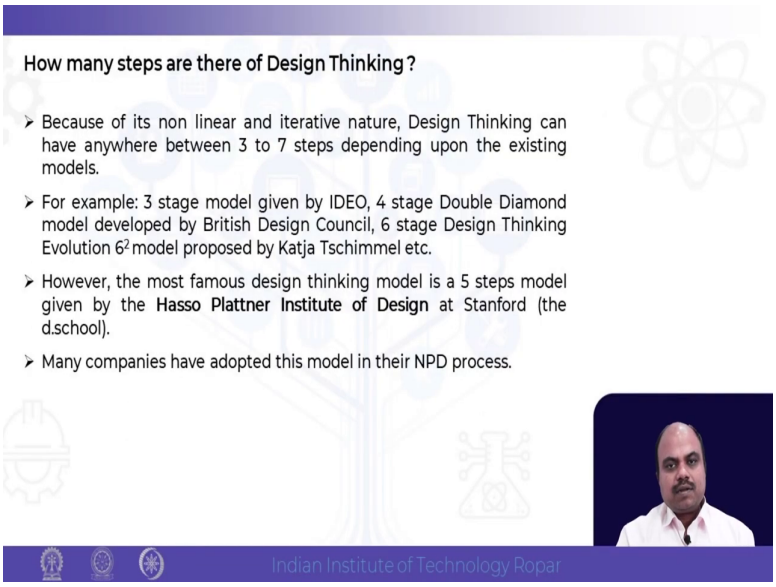

Now, let us understand or learn about Design Thinking Steps. Actually in design thinking step there are so many design thinking models are available. And some models have 3 steps some model have 4, 5, 7 like that. So, there are existing various models and these steps are ranging from something like 3 to 7.

For instance, you see that IDEO they have given the steps number of 3 steps as 3. The Double Diamond method which is there that is having 4 step and that was designed by British Design Council. And the 6th stage design thinking model it is called 6 square. It is a model proposed by Katja. So, there are several models which are available for a design thinking.

However, the most commonly used model and which is widely used in many places is the 5 step model of design thinking. And in 5 step model we will learn about this one after some

time. This was originally developed by the Hasso Plattner Institute of Design at Stanford University. The d.school it is also called.

Now, this company is many companies actually they use their models in new product development some of them they are using their design thinking models some of them they little bit of customization they did. However, the idea is basically the same. We use design thinking method to understand the user make innovative products for the user.

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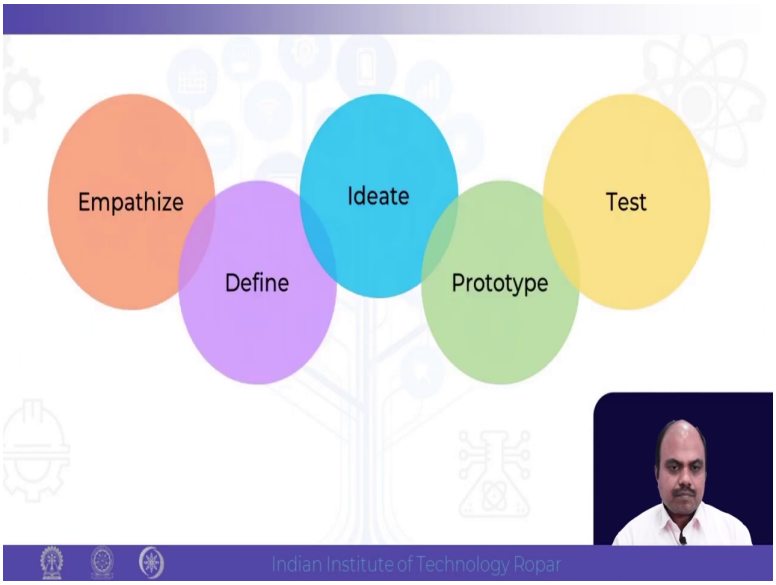

So, what are the five steps? What are the five steps? First is empathize or empathy. Empathy is where we will learn more about this one, but in general empathy is where we try to understand the user from their perspective. So, it is something like being as if we are the user and understand the user in depth.

So, that the product which we are making is very much related and relevant and exactly addressing the need of the user. There are different kinds of user what whatever kinds of user we are having the way of understanding the user in depth. Try to find out the pain pin points. Try to find out how they their lifestyle is. All these things are coming under empathy or empathize.

Once we empathize. Next one is define. We define what the problem is after understanding that. Exactly this is the problem. There could be some limitation to the problem. There could be some constraint to the problem. All these things we need to understand in the stage of defining.

Once defining is over we ideate. We find out solutions. We use various methods like brainstorming. There are other ways also. We generate a lot of ideas. Select the best idea among all those ideas. So, basically, we find out the solution. This is the most important step among all the process. Please understand this is very much similar to the product design steps. However, among all these five stages, ideate regarded as the most important step in the entire five steps of design thinking.

Next is prototype. Protype means where we prototype a solution. Protype may be physical, prototype may be virtual. It could be a solution which is discussed. So, it is a solution where we make an actual working of prototype. And that can be tested later on. And that is what the next is last step last step of design thinking is, fifth step of design thinking is testing.

Where we take the prototype, put it in front of the customer, see the reaction or we actually take the prototype and put it in the solution for the system and we see how the it is functioning. If not, we have to take this back again and make this cycle again. So, repeating again because this is important.

First is empathize, second is define, third is ideate, fourth is prototype and fifth is testing. So, these five steps of design thinking it is generally followed in many of the companies. And we are also going to learn more about these design thinking process in depth and this one.

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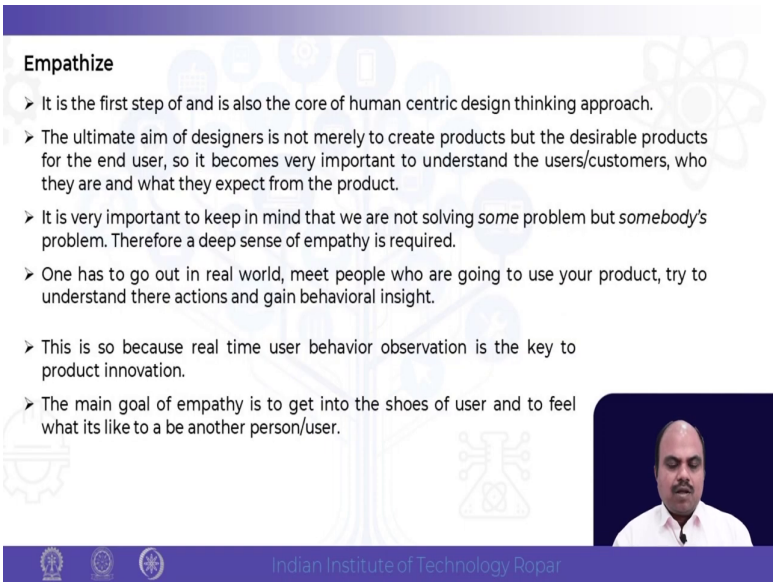

So, first step is empathize and the idea is that making or understanding user-centric design approach. Human-centric means, human-centric means, you have to understand the user in depth. It is not merely you know creating a product, but is making a product which is desirable to the end user.

It is very important to understand the user and customer in depth. What they exactly want, what they expect from the product because as a designers we get some time influenced by our own liking, our own understanding. But that is not the right approach. It is also important to keep in mind that we are not solving a some kind of just problem. It is we are solving somebody else problem.

And the deep empathy is going to help us in understanding the actual problem is until unless we go to talk to the talk to the potential customer, potential users. Until unless we go and see

the lifestyle is difficult to understand what the customers are expected or what the user is going to expect from this product.

So, we have to go to the real world, meet people and see how they are going to use it. And behavior of these people very different from each other, very even from cultural to cultural is very different, country to country if a state to state is very different, each of the people. So, not all the everybody will be different. Everybody will be same then there are also people of different social structure, some people rich poor.

So, we cannot make products which are looking for everybody. Often some products yes, some products does have the aim, but most of the products are focused for this certain group of people who are going to use them. So, real behavior understanding is the key for product innovation.

The main goal of empathy is to actually you know go into the huge, serious shoe and feel what to be like to be another user. So, here you have to actually make the survey, user survey, in the field survey going to the user and feel what their what they feel is, what they feel about the product need we have to understand.

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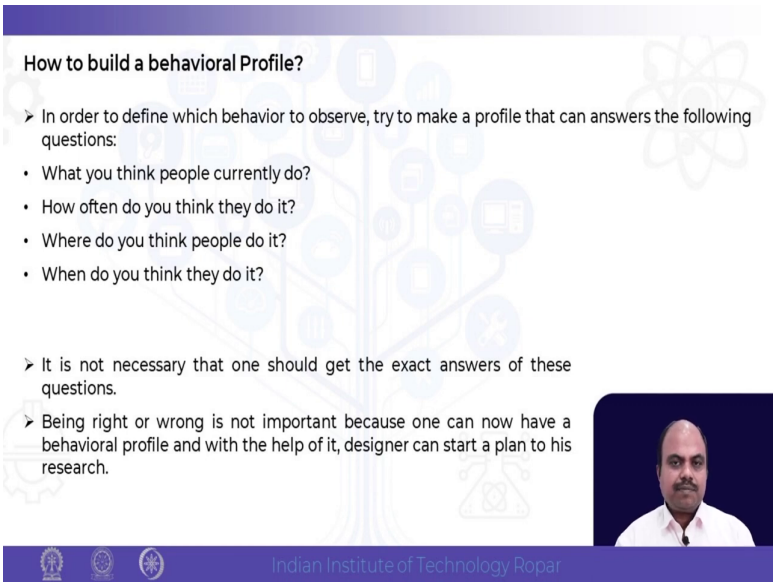

So, how to build a behavior profile? In order to understand the behavior, we have to observe and make a profile and maybe we have to ask a lot of questions. What do you think people currently do? How the questions are. How often do you think they do the one kind of activity? And why do you think people do it? Why do you think? These are all question, how the questions we need to ask to the users, to us also to understand the user.

We need to see that ok the user is doing these activities across the day from starting to the day and then how this life is going to go and how the product is going to be added. What do you think they do it? And here it is not necessary that one should get the exact answer for this. You know it is important that we should have a behavioral profile and understand the user in depth.

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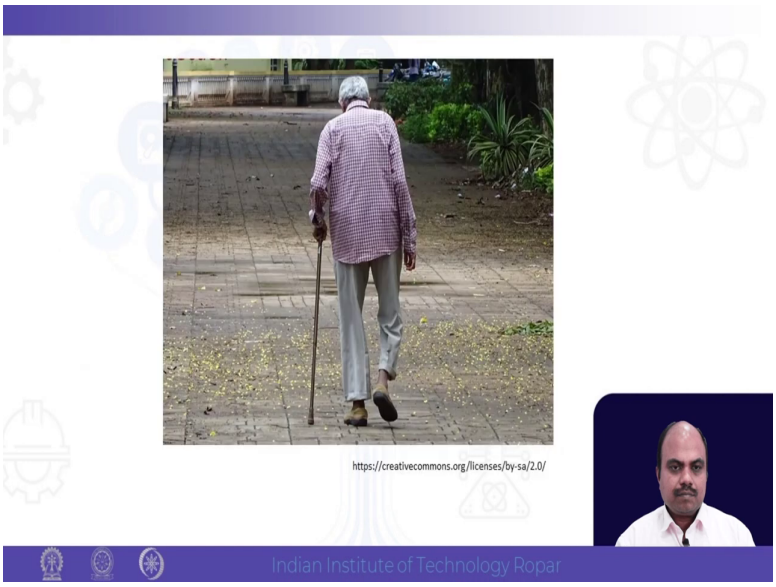

So, now take for example, we this image we see that an old person and if you wanted to understand the old person in depth, we have to actually see what exactly he or she is leading the life. So, we can have an interaction with them and see how their how their life is.

So, how do you think we can do the empathy of the older people?

Sir what I think is that there are various ways that through which we can empathize with the target customer like for example, here you have said that for a older person. So, the first one is that we can either role play the person or the end customer that we are for whom we are designing the product. And but the best possible thing that what I feel is that what we can do is we can actually go to the person; observe his behavior his actions towards it.

For example, like for older person as we can see from the picture itself that a person is walking with a stick. So, definitely for older person there is a there are some difficulties in walking. So, there so, depending upon the activities that they perform in their daily life, we can be there.

For example, if a person goes to visit a doctor or driving a car or reading a newspaper. So, for example, for driving a car we can say. So, what a designer should do is we can actually sit with the person, decide in the car itself in the side seat and they can observe the behavior, what are the feelings and what are the actions they perform while driving. So, because to pen down if I say that I have to tend to what the older person feels out.

So, that will be a complicated task because the feelings are very personal and complicated from their point of view. So, to be present with the customer to be there it gives a huge insights about the behaviors of the customer and we can understand more in a much better way about their problems. So, that they are feeling and we can design the product systematically. So, this is what I feel is that the true empathy we can achieve from the user itself.

Ok thank you.

Yes sir.

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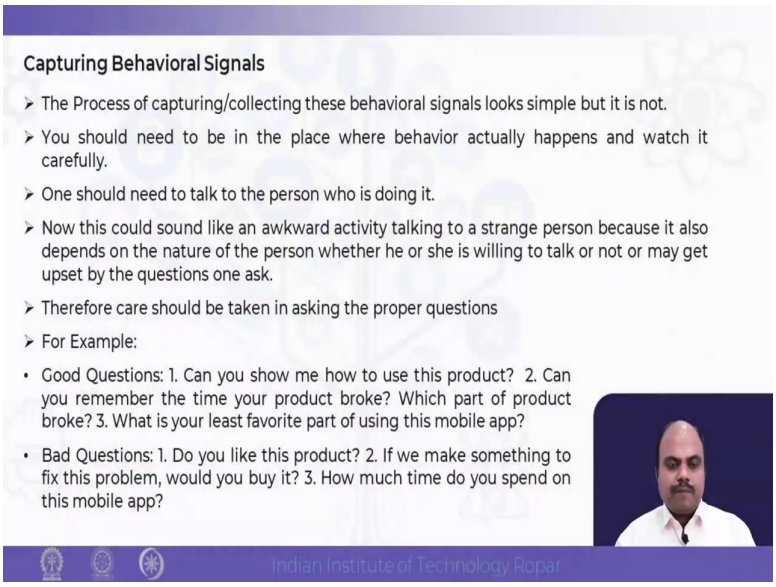

So, as you have seen in the example that capturing behavior signal is important. So, we possess in capture the behavior of these people. And then watch carefully what exactly they do and one should need to talk to the person who is actually doing those work. And now this is can you know sound like the awkward actually you go to the person and talk to, but this is what we are doing this is you know we cannot just sit in the chair and table and start doing drawing and designing.

Until we ask the question right kind of question, I mean they will not we will not we will not read about interact interaction is important. And the care should be taken that we ask the proper kind of question because know when you ask the question which is influencing our designing that kind of question we need to ask.

Then for example, good question can be can you show me how to use this product then we will say ok this guy is this person is using this product in this way. And do you remember the same time what when the product broke what kind of thing is there. So, what is the favourite app and there is certain question a little bit we have to avoid like you know do you like this product ok.

Then of course, people will say yeah, I like the product or very less people will take I do not like the product. So, and then if you make something to fix this problem what will you buy it. See we have not shown the product right now solution and then we are telling the person that if I fix this one then will you buy it. It is a difficult question to answer for a person ok. Then how much time you spend on the mobile app? So, something it is yeah it is good for some extent, but some extent is not so, suitable also.

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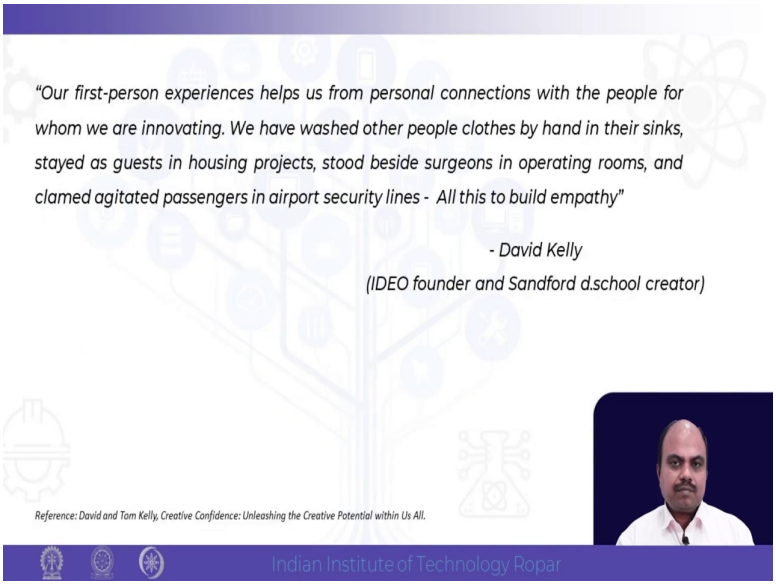

So, David Kelly he is the founder of IDEO and Sandford d.school creator. This is quote from him that “Our first-person experiences help us from personal connections with the people for whom we are in innovating. We have wash washed other people's clothes by hand in their sinks, stayed as guest in housing projects, stood beside surgeons in operating rooms, and clamed agitated person passengers in airport security lines - All this things they have done all these to build empathy.

So, you see this kind of this kind of empathy is not an easy job because the person or designer has to go and get involved not only asking question, but get involved with the people who are going to get empathy we have to have empathy. So, this is a kind of detail understanding is required of the user and this is what empathy is all doing.

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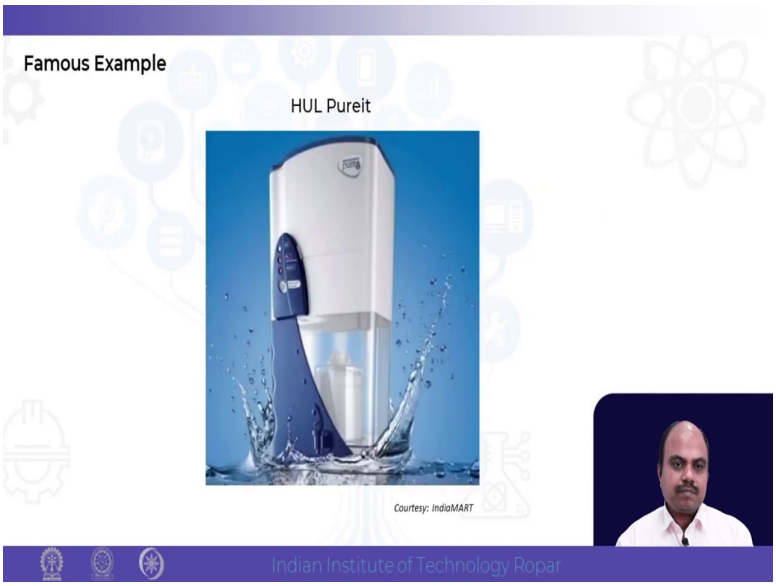

So, here is famous example of HUL Pureit. So, as you know in the (Refer Time: 16:11) a Unilever this are the this is a company which has started this Pureit and nowadays we will see other companies also. Originally these researchers I mean of course, the designers, but I will talk about design researchers and other engineers they actually went to the various places in villages and found what kind of pin point they are having.

They have found that especially Indian villages they do not have good water for drinking. Water is not safe for drinking. So, what they do? They take water; they boil and then start drinking. But boiling is not easy job. Boiling is going to change the taste. Of course, it is very good water there no doubt about it. It is going to reduce the minerals also. Contaminate definitely is going to go off it was fine, but boiling is going to take time. It is going to take effort; it is going to take energy.

A electricity is something which is not always available in the villages always in the places. Solution is that we need to have a filtration method which is standardized according to something like US standard and then the water should be drinkable. It should not run on electricity. It should be economical.

So, ultimately with all these understanding they came out with this system Pureit. So, how it works? It is having some kind of filtration system and water is going to be on top of it and due to gravity, it is going to filter and then whatever filter is coming filtered water one can drink it is very good filter.

After something like 1500 litres of filtration you need to change that candle that cost is only 100 300 rupees. So, you can see this kind of understanding if it is not there coming up with this kind of product is very difficult. So, this is the why slowly it becomes successful.

There the company has made a lot of profit by selling this product and the reason is that they have actually understood the pin points of the people in the villages and this is a very good product also even now also I mean modern design has been changed, but something which is very good for the villages.

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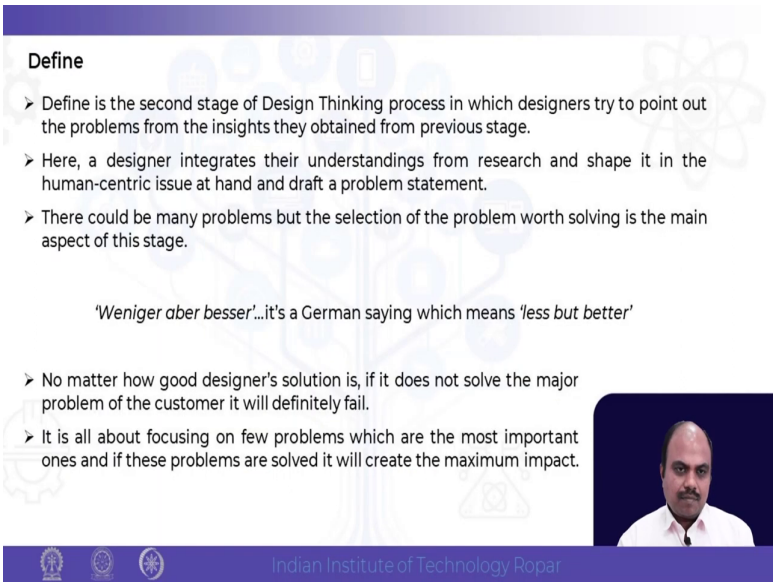

Now, we are going to go for define. The second step of I this design thinking is the define. Define is where we are going to understand from the understanding, we are going to define the problem in depth. So, we are going to find out the problems and pin point this is exactly the problem is.

So, human centric issues is a problem and then you know draft the problem statement. So, problem statement is drafted and this is where this is going to also can help in you know many problems, but selection of problems and over solving is something which is very important what kind of problem we are going to solve.

And this defining is important because we are going to evaluate also with respect to the definition of this problem which we have tried to we have defined it as a draft as a problem

statement. So, there is a saying in German that Weniger aber besser it means that 'less is better' which means that if you want to define a problem and find out the actual problem.

So, we have to be concise as possible. Now, no matter how good designer solution is, if it does not solve the major problem the customer is now going to definitely buy it. Advertisements if you do more advertisement some people will buy of course, initially, but later on it will not be successful.

So, we have to focus on the few problems and most important problem. So, these are the things these are the things which we need to define design a problem which we have to when we are understanding a problem from empathy here, we are defining very specifically this is the major problem and of course, there are some other sub problems.

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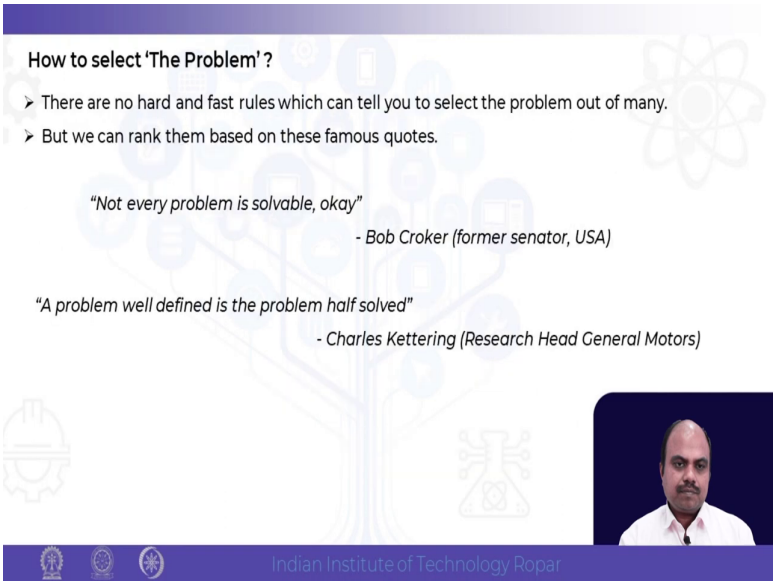

So, how to select a problem? There is no hard and fast rule and there are also of course, there can be many problems. So, we need to rank there is a you know we can rank the problem.

So, there is some quotations which like to say that is “Not every problem is solvable, ok” which means that Bob is telling that we have to understand that we are not we cannot solve all the problem we have to solve which is a problem which you can which we are confident that “A problem well defined is a problem half solved.” Why?

Because when you are understanding the problem and finding out the exact focus of the problem is we have already understood that the solutions of this you will be focusing on this problem only. So, it is saying like that.

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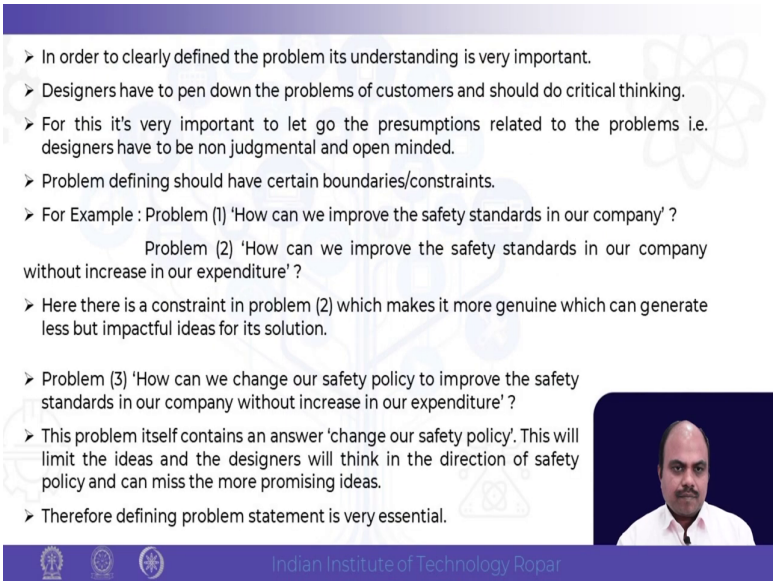

So, in order to clarify clearly define the problem we need to understand understanding is very important. And designers have to have to paint down the problem of the customer and we have to use critical thinking for this. So, because this is important because there is a lot of pre presumptions which are there that is designs designers has to be non judgmental and open minded.

So, if designers think that this is a problem is not always true. Sometimes the problem is there in the mind of the user and until unless we understand it we should not assume that we have understood ok. So, it is not of course, not easy reason. So, when we have a problem of course, most of the time the problem comes with some constraints.

So, for example, how can you improve the safety standard of our company? This is the standard these are like a standard or this is a state forward question. However, if we have this one that - how can you improve the safety standards of our company without increasing our expenditure?

Then there is a constant is there and within the constant if you want to work then the problems then the solution which you are going to come it will be more useful for the company because the previous solution previous problem if you take solution will come.

But that means the price ultimately it will not be implemented, but this is the something which is important that we are going to work it is better to work with some constraints also. So, you know here is contextual problem two like what makes is more genuine and we can generate less, but impactful ideas in the solution this is what it is. And then how can we arrange our safety policy to improve the safety standard in the company without increasing the or expenditure?

So, here we are going to add some more constraints to this one like this we make the define the problem such a way that the main problem is focusing on the main agenda. However, constraints we are adding to make the solution more applicable for us or to the user. So, we have to define the problem in depth.

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Next is the important thing is coming to coming is the ideate. So, in ideate the first thing is ideate is the third step in the among the five steps of design thinking. And here we generate lots of ideas more ideas are better and then naturally the tendency of you know design as many times ok I like this idea because I have generated it.

Or this is my first idea ok seems to be a good idea this kind of confidence is not always good because it has been found that more and more we think about the idea the solutions will be better. An out of box thinking is something which is important and then if you have high patience as a designer and ample time you have to spend is true for even for research also right. If you do research and we are thinking about a problem for more then we are getting better idea.

The creativity innovation you should understand that we should generate more and more and more solutions that is going to be make us more creative. So, Marc has given a very good quote in this one “The best idea really come on a mountain top in a flashing of lighting” which means that indirectly it is telling that you should generate more and more better ideas. He is a co-founder of Netflix.

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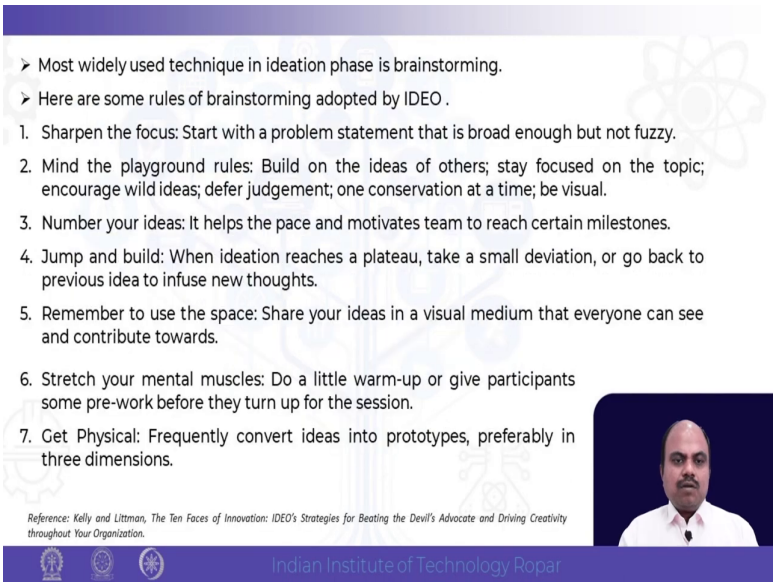

So, what we see here that there are so many techniques for idea generation and the one of the most commonly used technique for idea generation or ideate is a brainstorming. This is very common in industry and there are certain rules are there for brainstorming one is then sharpen the focus, start with the problem and then broad away and there is broad enough.

And then you know mind the play playground rules which means that you focus on the idea and differ judgment do not judge each other's idea and then be more visible interactive. And

then number of your ideas: you can put numbering of the ideas and build each other's each other's idea. And then jump and build: When ideation reaches plateau a small deviation and go back to the previous idea and then change it modify it and then give a particular space.

So, and then stretch your mental muscle which means that you give the participants and little warm up the practice is required. So, all these things we are what we are trying to do we are trying to make products which are a generate ideas which are more improved and out of the box and of course, prototype is possible that is if that is and then we again use the same technique to generate more and more ideas.

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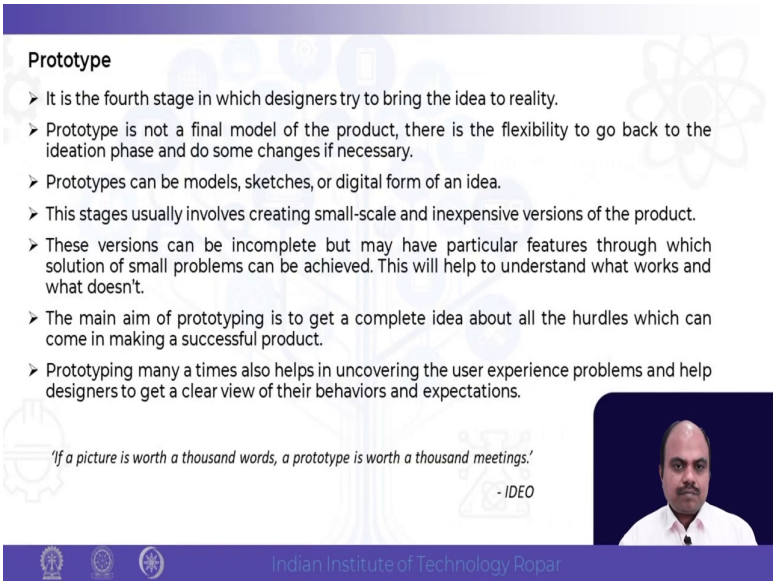

Now, the fourth step for design thinking is a prototype. Here we are trying to bring idea into reality. So, where the prototype is not the final model, but it is you know it is a; it is a product which we are making and in testing we are going to test with the user. So, here it can be

models, it can be sketches, it can be digital form. So, what you should select is select it will basically it will select a model that type of product or the solution which we are expecting.

So, for some kind of solution models may be enough, some kind of solution sketching may be enough, for some kind of written material may be enough, for some kind of things we may make actual working model maybe use IT manufacturing to make the models. And then some kind of sometime it will be incomplete and the versions can be incomplete, but it should have the features to explain the people this is the idea which we are having.

And the main aim of the product is to get the complete idea of all the hurdles and which can make a successful product. So, and then prototypes can be of can be of many times and multiple times it could be there. So, from idea another quote which is quite interesting, if a picture is over 3000 words a prototype is over 3000 meetings, which means that when we have prototype, we can easily know this is the product which we are going to give to the customers and this is going to reduce lot of confusions.

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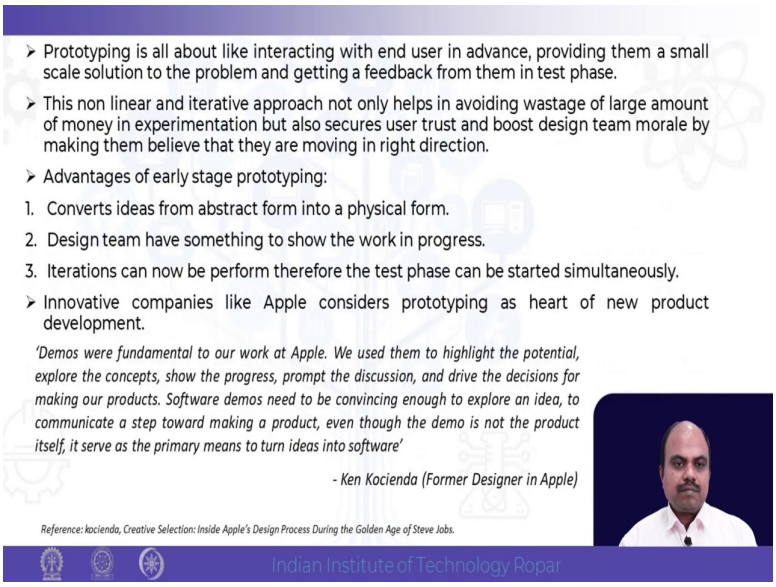

So, prototyping all this you know like you know interaction and end of the advance providing a small scale solution and then getting the feedback this is something which is which is done in the testing phase and prototype is where we make the product and try to see the testing is done later on.

And then we also need to see that it is not a is a we should also avoid wasting lot of money because in the prototyping it is a something like expensive product process; the process which we have if we make the product and then we show it to the user something not possible.

So, we make the prototype and show it to the user. So, but also, we need to have some idea how much to prototype and when to prototype. There are some advantage of course, for all

the prototyping that it converts the abstract form this is the idea which we are having and the physical form is something which is very valuable and this can be shown later on to the user.

And design teams can work on something which is you know work in progress that also we can show in between. Prototype we need not be you know everything is complete and then we are doing in between also we can do. Then iterations it could be done simultaneously or one by one. Like Apple they consider prototypes very important.

Ken the former design in Apple this is the quote from him that ‘Demos were fundamental to our work at Apple. We use them to highlight the potential explore the concept, show the progress, prompt the decisions, and drive the decisions for making our product.

A software demos need to be convincing enough to explore an idea to communicate a steep towards making a product, even though the demo is not the product itself, it serves as a primary means to turn ideas into a software.’ So, that is what the importance of prototype is here.

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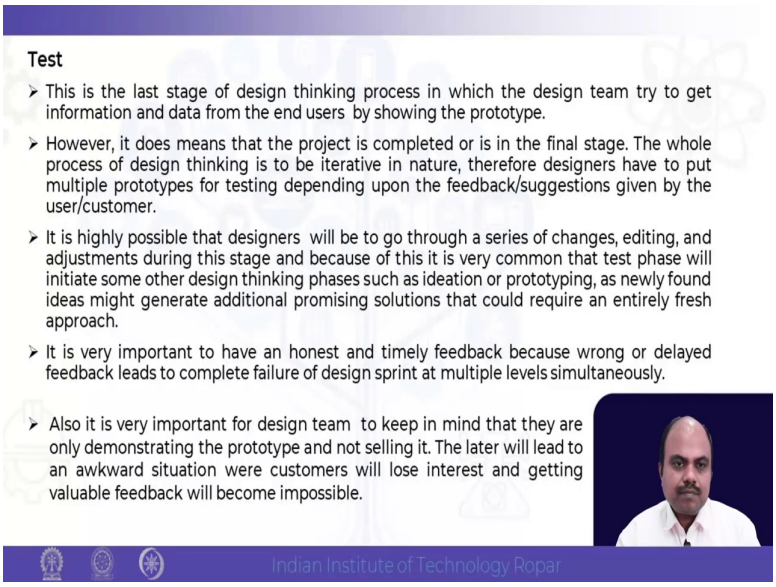

Now, the finally, we are going to the fifth step of design thinking that is the testing phase of test. So, this is last stage of design thinking or fifth step and here we test the prototype of the product with the users which means that we gather data we collect the data from the user.

And see how they are filling of the product what is their feedback is. So, of course, there are some techniques we have on this; however, the most important thing is that the product when it is final stage, we have this multiple product which we prototype and we can get feedback and suggestions from them.

So, this is the product which you are thinking of are we telling about this is the product which you like or do you think this is the any changes are required what do you feel about the product do you think you are going to use it. Also, the various questions can be coming, but

until we show to the user and also sometime you know verbal and informal information also you can get it.

So, you have to have a you know series of changes also possible editing is also possible and this is a basically a testing phase which is of course, important and feedback from the user is where we are going to take in various ways. So, this is we should understand that we are trying to demonstrate the product we are not selling it ok.

We are not trying to look at you going to buy it or not ok do you think like it or no, you going to understand what the product feel what the sorry, what the users feel when they see in the product what the customers is going to seen, why they are interested, why they do not have interest in this one?

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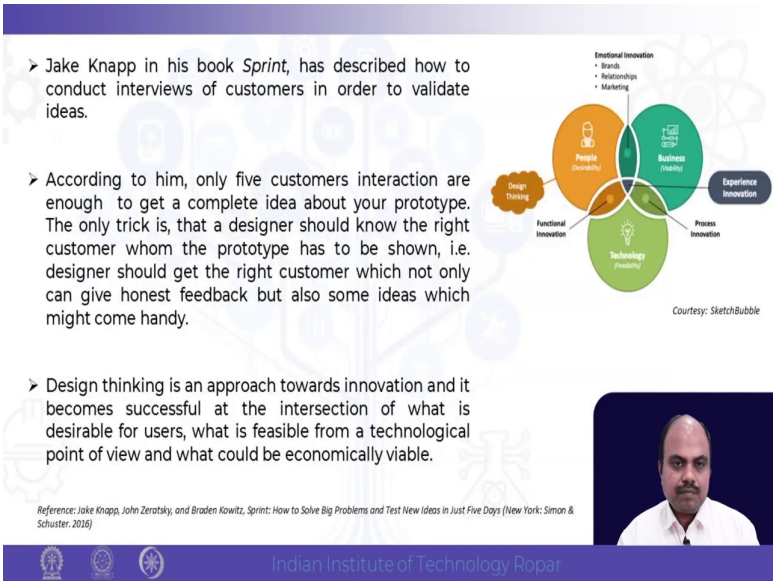

Next is Jake Knapp in his book on Sprint, he has described how to conduct interviews and how to validate it. So, according to him, the five customer interactions are enough for a complete idea of the prototype and this is the only trick that a designer should know the right customer with whom the code I should be shown not on the customer.

Design should know get the right customer in which not only to give the honest feedback, but also give the ideas which might come. And design thing is approach toward innovation is very important to approach to innovation and it becomes successful the interaction of what is desirable to the users, what is feasible and technological point of view and what seems to be an economic and viable options for the designing.

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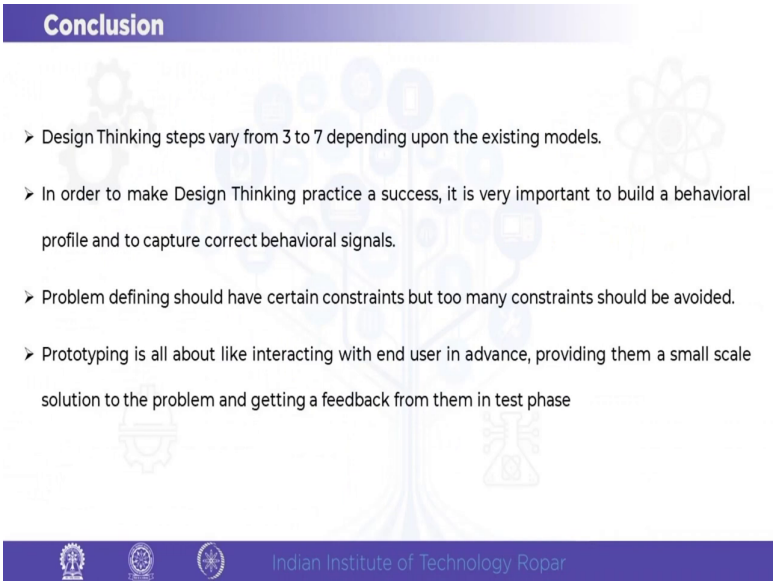

Thank you.