Entrepreneurship Essentials
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Module - 06
Lecture – 29
Design and Innovation – IV

Hello and welcome. We have already discussed about Design and Innovation in the last 3 sessions. In this session, we are going to cover design thinking and design thinking in particular and then in the next session, we will be covering open innovation and little bit about IPR.

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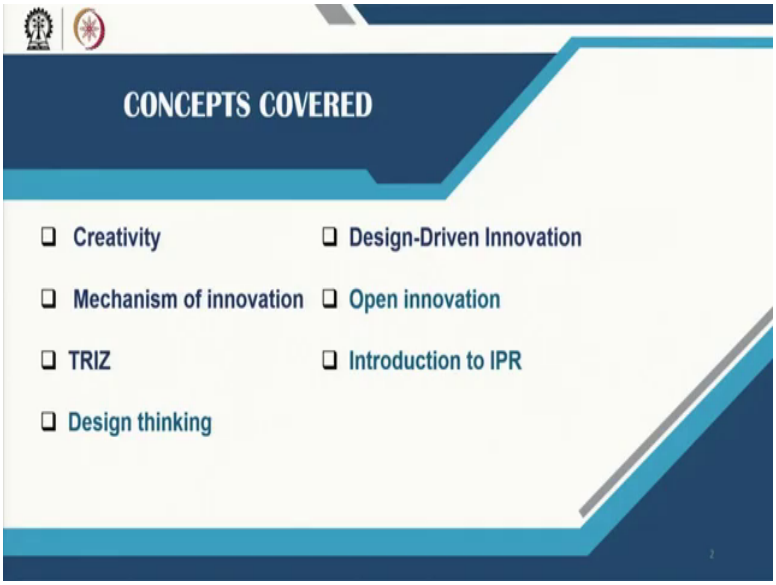

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So, let us move ahead. Now design sensibilities actually is a rejection of the practice of viewing as a viewing a product as a bunch of features or qualities things like that. It actually explains a product in a very different way; the is the in totality it is the sense of well being that may be psychological, that may be physical, that may be aesthetics etcetera.

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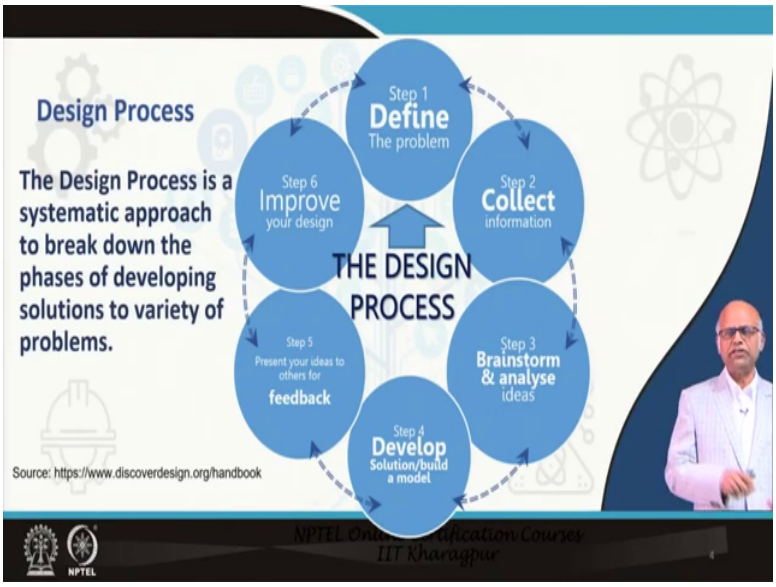

And we have already seen that product development particularly the iterative process of product development progresses through if a step by step process like you define the problem collect information. This information actually is from exogenous sources like the state of the art meaning whatever knowledge is already existing in the domain. So, rather than reinventing the how will, you gather information. Then you brainstorm, you try to find something new. Then eventually after you converse into one particular idea that you think is plausible, you develop you build a prototype get it, validated by customer, you receive feedback, improve redefine that is the way move moves forward.

So, we saw that in lean start up lean product development where in the aisile process actually is the validated learning that is build measure and learn validated cycle. So, using the same

philosophy and moving far ahead, Stanford University have come up with a new of new philosophy new ethos that is named as design thinking.

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If you if we go through the whole process of design thinking, you will realize that this was pretty much there always in the domain. But then without miss people some people who were very smart, they had a deep thought process of systematically targeting or systematically developing product in a very step by step manner.

They used to almost follow design thinking philosophies. So, when design thinking was propounded, it was with this objective that if there is something very official something very formal, then everybody can derive the benefit of the systematic method of thinking systematic way of product development or doing or performing innovation. And that is when that is the

reason why design thinking has been evolved. So, this is applicable for product, process or service.

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IDEO is one of the greatest design company designer company in the world and Tim Brown from Stanford Universities on one of the cofounders of IDEO. He if defined or Tim Brown was one of the pioneers who propounded this philosophy and he defines as this way "the design thinking is a discipline that uses designers sensibility and methods to match peoples need with want in and is technologically feasible and what is viable business strategy can convert into customer value and market opportunity". Meaning you put designers sensibility in a commercial context. So, that customers become happier and you make money.

Thinking like a designer can transform the way you develop product service processes and even a strategy meaning that you try to understand customer's need, customer's aspirations.

You try to even understand the pain that persists with the customer, but they are not aware off. So, design actually mines in those areas which are not visible and it makes it visible and then you develop a product, the customers think that yes I need it I definitely need it. Meaning it is not something that is good to have, it is almost indispensable that is the beauty of design thinking.

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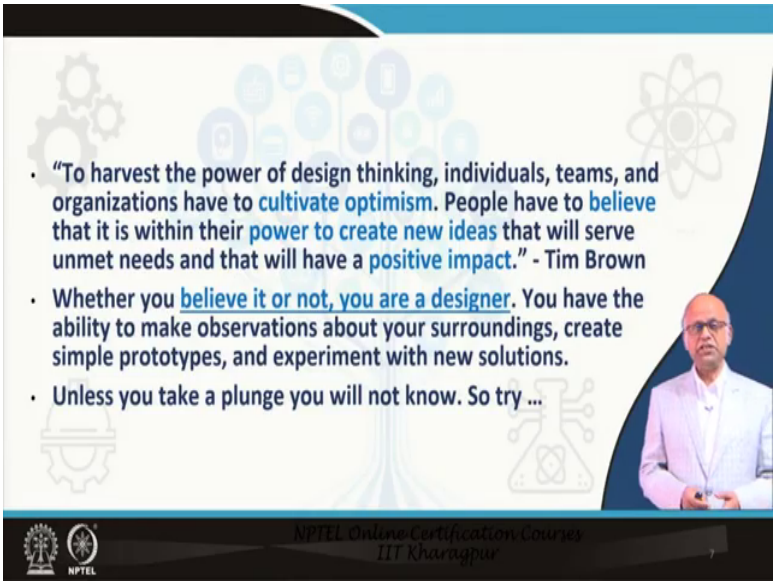

Tim brown says to harvest the power of design thinking individual teams and organizations have to cultivate optimism meaning you must start with a leap of faith that there exists a solution somewhere in the horizon, we have to find it; there is always a better solution. So, with that optimism someone has to start. People has to believe that it is within their power to create new ideas that will serve unmet needs and that will have a positive impact.

So, leap of faith and then you think that we definitely leap of faith is there is a solution and you think that you can come up with this solution. Most importantly and most important part of this whole slide deck is that earlier also I mentioned this that everyone is a designer. You have to believe that you are a designer and you can think out of the box and you have to engage in this kind of thinking.

You have to do lot of work as I mentioned that unless you enter into the kitchen, you will not have any idea how to modify the frying pan, but the moment you will be using that problem, problems with will crop up and then your brain, your subconscious and conscious both will collaborate.

And then finally, come up with some ideas you will have eureka moment unless you take the plans you will never know that you have enormous capability. You have to; you have to engage, then get the problem fill the problem first hand do experiment and then it will come and only, then you will be more creative.

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Because the moment you give the problem to your subconscious not only subconscious the moment you churn any creative problem in your right side of the brain, your creativity improves just as we always try to read something try to comprehend whatever is written and then gradually our cognitive part of the brain improves. Similarly if we try if we engage in creative persuades, it is going to improve our creative part of the brain, your design will increasingly match the need of the target group.

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So, step by step let us just move slightly slowly design thinking and encourages people to explore alternatives. Meaning we are habituated to think something as a solution, then we move forward to prototype maybe etcetera there, then things become very very complex and very very time consuming and money consuming because you move ahead with a particular idea you find that it does not work.

Then you come back you start with another idea design thinking is an iterative process and you normally do not start building a prototype unless you diverge with many many ideas and then you converse with the most possible most viable idea among the ideas that you have come forward. So, you eliminate many steps, many need or many prototyping etcetera creating options that did not exist before you in the process create some options that did not exist before. Because you empathize empathy is the core of design thinking will come to that.

But once you empathize you ideate while ideating; you again talk to customers or people with the pain. So, this collaboration this to and fro information sharing is going to evolve new ideas that was not in the horizon at all. Focus on the needs of the users, it is not just functionality just add some features.

And there is a product that people will not have new experience that people will not find new meaning in that product. It is about sensibilities, it is about well-being, it is about the context time and at what context they are using that product whether they are using a pointer in a business context or drawing room context makes a hell lot of difference about culture of the stakeholders.

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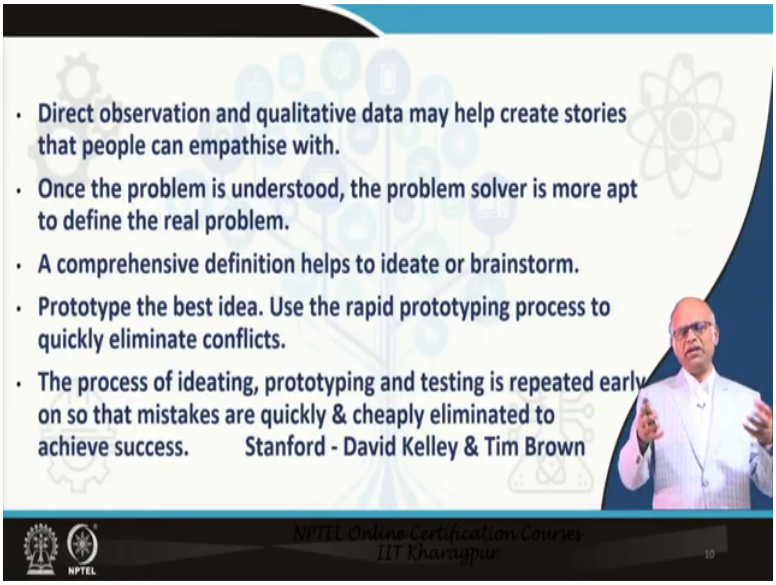

So, it all depends on that. Again the same thing repeated in a different way. Direct observation meaning design thinking is insist that you have to directly direct, you have to

observe directly you have to understand the pain by means you have to say look at things with the eyes of others, you have to hear things with the ears of others, you have to fill the pain with the heart of yourself, but feel other peoples pain.

Once the problem is understood thoroughly comprehensively only then the problem is defined well and a comprehensive definition is going to help you to come up with newer and newer ideas. The more ideas you come up with, chances are that you are covering many many possible ideas and out of them one of the nice idea will come will we you will be able to come up with one of the nice idea that will emerge as a wonderful solution.

Then you prototype that, without prototype without prototyping is very difficult to say whether a product is good bad or ugly. Particularly after prototyping, you will think that whatever assumptions that you had about a product, many of them do not sustain many of them actually will give. You nasty surprises you think that it is going to be like this and then we have a product then after you start prototyping, you find that you presume something there are so many conflicts that you cannot move forward.

The process of ideating, prototyping, testing is repeated early once as to eliminate all mistakes. So, this iterative process actually in a product development context is very very important to eliminate mistakes eliminate un probably or say unviable propositions unviable ideas and then come up with new ideas which are not there in the domain at this point of time.

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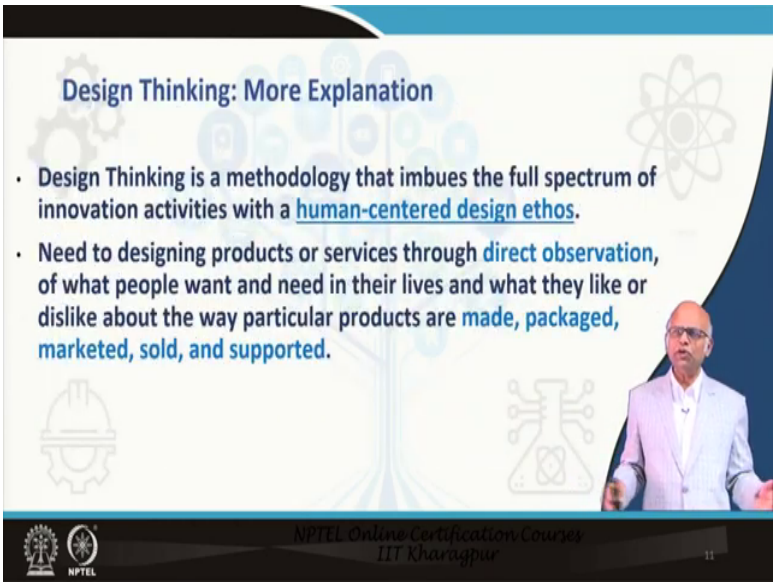

It is a methodology its human centric because every time you are interacting with human with the right with the people with the pain. So, that is why it is called human centered design ethos. Otherwise you sit in a design studio and then you have a problem, you read a lot of books and periodicals whatever is the state of the art you try to understand that and come up with the solution, there is no connectivity with the people who have the pain or who are your final target audience.

So, that the chances of matching product and customer's requirement is very very remote. Need to design need to designing products or service through direct observation of what people want and need in their lives and what they like or dislike about the way particular products are made package, marketed, sold, supported.

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So, it is very important that you get this idea from the customers. Not the idea per se, but understand their aspiration, their culture, their socio economic standing only then you can make decisions about the packaging about features about qualities about pricing about where it is to be positioned etcetera etcetera. So, the designers mind set; designer mindset is not really problem focused, it is rather answer focused or solution focused. They means the action they are action oriented towards creating a preferred future.

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So, you have to be able to view the world by the customer's eyes for whom you are developing this product. Design thinking has five significant constructs. They are empathize define, ideate, prototype and test. We have already discussed all of them, but we will just elaborate one by one.

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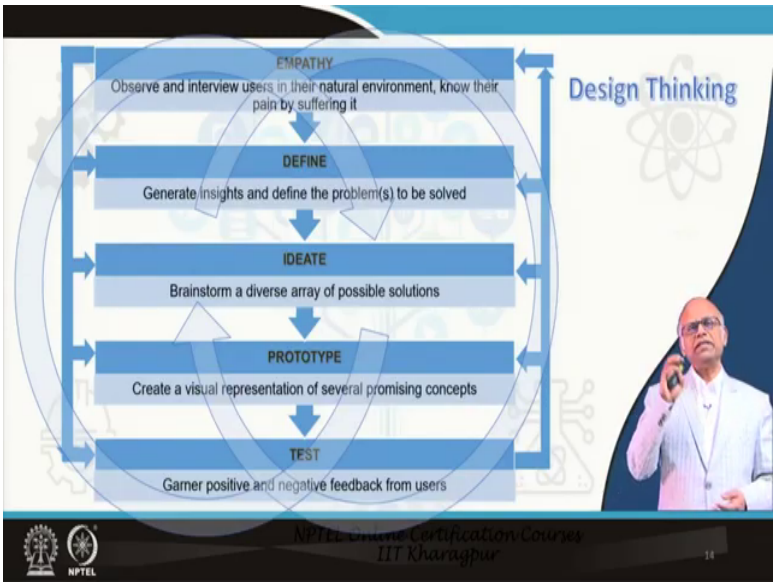

The same diagram like this five constructs can be also depicted in this manner. The difference is that we are showing here that it is a iterative process. You move forward in the development process, the same time you can always move back backward to revisit based on the experience based on the data that you have gathered from customer and refine your own hypothesis, refine your own definition or idea or prototype etcetera.

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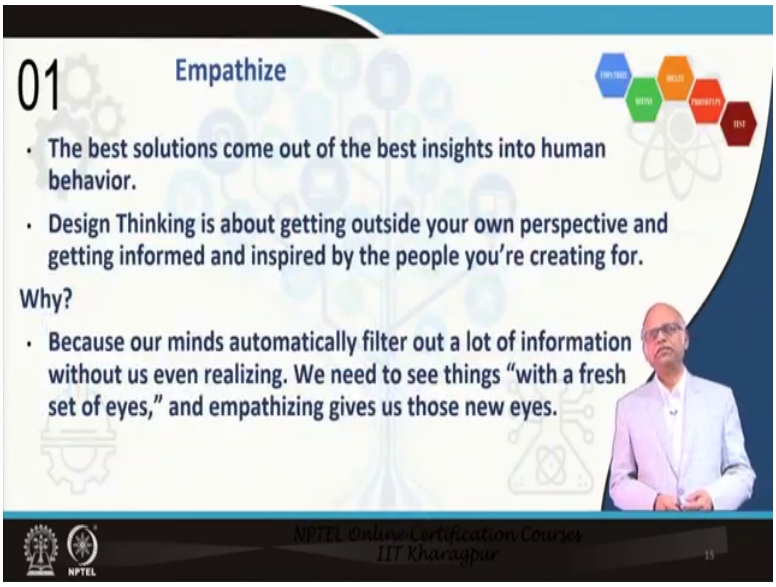

So, that also depict design thinking in a as an iterative process. The first construct of design thinking is empathize. Empathy we have already described, I will give just spend 2 minutes time to give a very nice example.

In Nepal, there was a new hospital and in that new it was at a hill top or maybe at a very high altitude which is very cold. So, they build this hospital because of the weather and proximity to a large cluster of people. In that hospital, babies were not surviving immediately; after they have were born they were dying 100 percent death.

So, people thought that there is a curse in this hospital. So, they invited doctors from all across the world, many doctors came and they said there is no solution. We find that everything is perfect you are following the best possible system in this whole delivery

process, but then we do not find any problem. So, they went back. So, government thought that there is a curse in the hospital.

Then this design thinking team from Stanford University came to know about it they came to this hospital to see. They also thought they also found that everything is so, perfect so, modern. So, they also did not find any clue as to what was going wrong that babies were dying within a day couple of or maybe within a just the same day they were dying. Then somebody in the team reminded everybody look we have to empathize we are forgetting the main philosophy. They said empathize with whom then because babies are dying so, we have to empathize with babies.

So, how do you empathize, how do you become a baby that is the whole story. One guy said I will become a baby. How he is going to become a baby? He removed all his clothes. So, he became a baby and he said that when the baby comes out of mother's womb whatever you do with the baby you do the same with me. So, baby was born and then he was taken to incubator in the next room. So, this guy also was carried on the stretcher to the next room. From this labor room to the next room, there was a corridor.

So, in the corridor of actually it was ice cold and the guy jumped, he said eureka I have got a I have got the solution. What is that? When the baby was taken from that delivery room to the incubation chamber, there was this corridor which was few seconds of journey, but the baby who is coming from mother's womb coming out of mother's womb he or she could not sustain this trauma that this cold this minus temperature is giving him or her and then the solution came.

They built something called embrace which is a very simple product, it is something like a quilt is a kind of a envelope. You just push the baby inside and then carry the baby to the other room and fatality came down to not even 10 percent that was a product, it hardly cost anything maybe an Indian rupee, it will be costing something like I say 200 rupees even less than that. That is precisely what is empathy. You have to feel the pain by suffering the pain itself.

So, the best solution comes out of the best insight into human behavior that is why you must have the right insight; not just you watch some crying, somebody suffering, ask him, it is not going to give you the solution. Design, thinking is about getting outside your own perspective your perspective is biased because your background your experience everything is biased because our mind automatically filters out a lot of information without us been realizing. Because everything is filtered through our experience, through our knowledge, through our education; you have to have fresh set of eyes.

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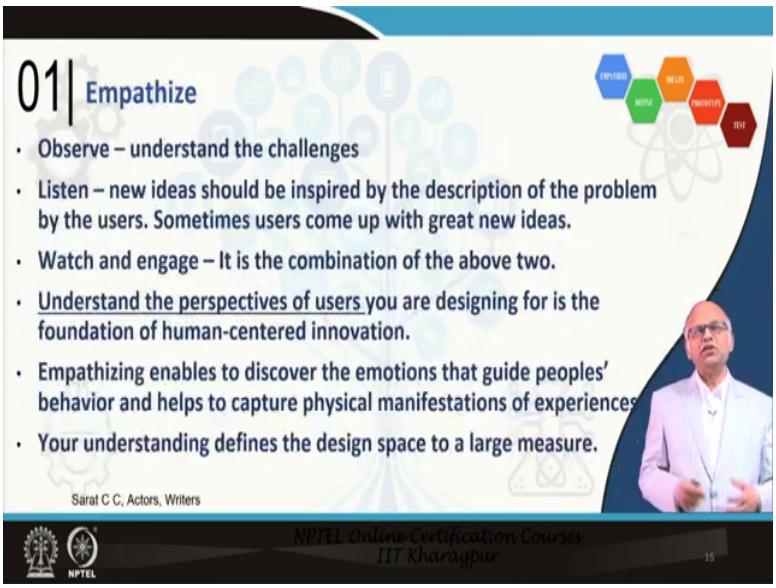

So, observe; observe, suffer, participate, engage, talk to them, live with them only then you get the right philosophy particularly listen to them. Suppose you have you have empathized and again you have come back to ideate, you have to again go and listen to them. They are they will give you sometimes a better solution than you can even think of coming up with.

Sometimes users come up with great ideas, watch and engage, understand the perspective of the users. So, you have to kind of ask them to use something whatever is available in the marketplace. See how they are using, what buttons are they pressing, you will know that this these are the features that they are interested in. If they are not pressing some buttons, you will realize those features are not so much useful to them, they are not interested.

There are wonderful examples like the one that I have given. You must be familiar with Devdas was written by Sarat Chandra Chattopadhyay, a Bengali write author and before writing Devdas, he went and lived in a brothel to understand the philosophy, lifestyle, the mentality, the idiosyncrasies of the people who lived there of the outsiders who come there only then he could write such a masterpiece.

There are many actors, there are many writers like this who actually become the person that they are going to depict like suppose you are somebody is going to Amir Khan particularly does this. If he has to not always, but then I my understanding is like this that he if he wants to play a role of some character for a while, he will become that character and watch other people, how they react behave to really get into that character himself.

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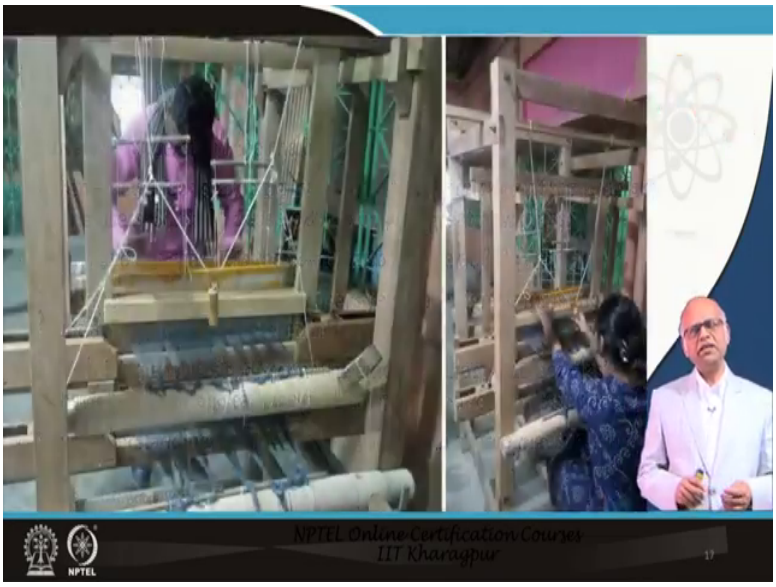

So, that becomes not acting, but just performing. Recently I was invited by an NGO from New Delhi called Seva Bharath. They asked me to visit a cluster where a lot of handloom weavers are there and they have health issues. I am not a textile engineer, but still from my institute I was interested to go there and see what the problem is. So, when I from morning till evening I was watching and watching and asking them questions, they were they did not have any clue about the kind of things that I wanted to know.

I said do you feel so much pressure while you press that or pull that for moving the shuttle. They said no, this is we are fine means we are habituated. So, that shows that even they are not aware as to where the where the problem lies, but it is actually the problem is actually there and that is why I was there to reduce the force requirement to move the shuttle from left to right to left.

Then when I asked them do you feel any pain here because you are pulling it too so hard. They said; after yes, after few years of operation few years of work, we normally feel very very much pain and we have to take painkiller etcetera etcetera. Their working active hours out of the day reduces etcetera etcetera.

While looking at them and while talking to them, I got to know that their economic condition also is very very poor meaning they earn about 150 rupees a day by making 1 saree. So, my focus was shifted from health to economic files because most of the ladies who use this machine this handloom, they are migrating to cities to do domestic help job where they are treated as servant.

Why so, because why they are going is still because 150 rupees is too paltry as some they really cannot maintain. If they can earn 300 rupees a month that is what they said 300 rupees a day, it makes a decent income for them. So, I embarked on doubling the capacity of this machine, It is just the early prototype which is getting built at in a Nadia district a place called Folia.

So, I am just trying to tell you that through my process of empathy, I keep going there I watch them day in and day out and interact with them and try to understand the challenges that are there. So, this is the machine that is coming up and then I am hopeful within a month or two, I should be able to deliver the first fully operational machine.

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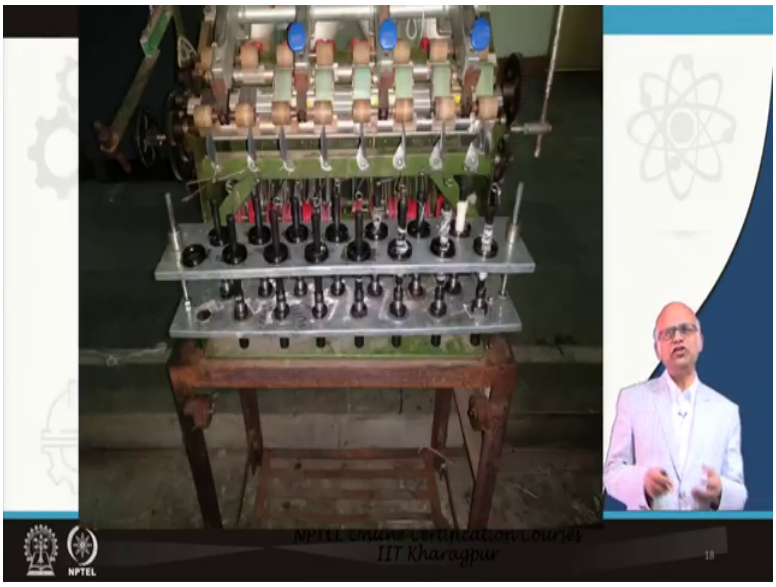

I am also working on a Charka Amber Charka where all Khadi, Yarns are made. This has normally 8 spindle, 12 spindle, 16 spindle. It is very difficult to operate a 16 spindle machine.

Now, I have just converted a 8 spindle machine into a 16 spindle machine. This is just 15 spindle, but it is not still fully working, but then the idea has been proven that it actually works. I have converted a hand driven machine into a leg driven machine that is working perfectly ok. Now if I can increase this number of spindle without increasing the requirement of force in fact, I am going to reduce the requirement of force.

So, it is going to be a much better machine and I am actually doing it through empathizing though I do not follow the step by step process of design thinking, but naturally I am following the philosophies perhaps without really following the books.

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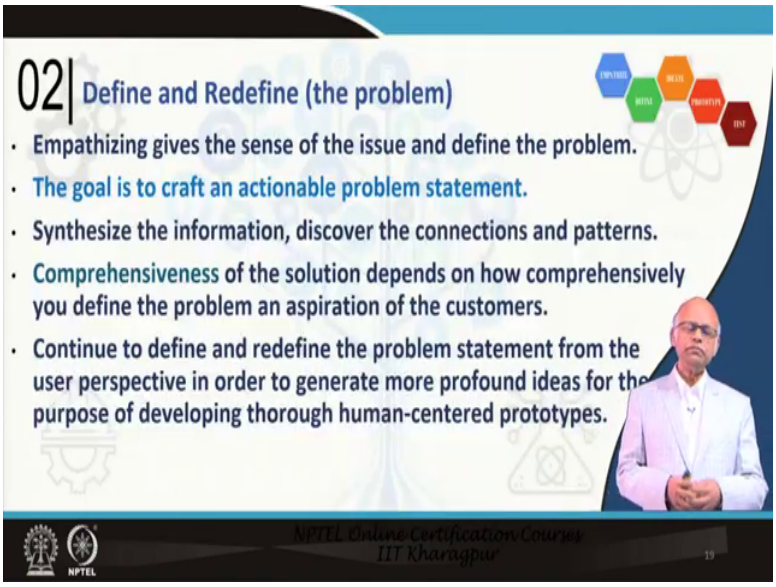

So, once you have a comprehensive idea about the problem, then you can really make a comprehensive definition of the problem. And if you have a wonderful means we have complete definition all features, all problem, all challenges, all contradictions that will help you to ideate come up with new idea that will help you to prototype and then finally, find a solution.

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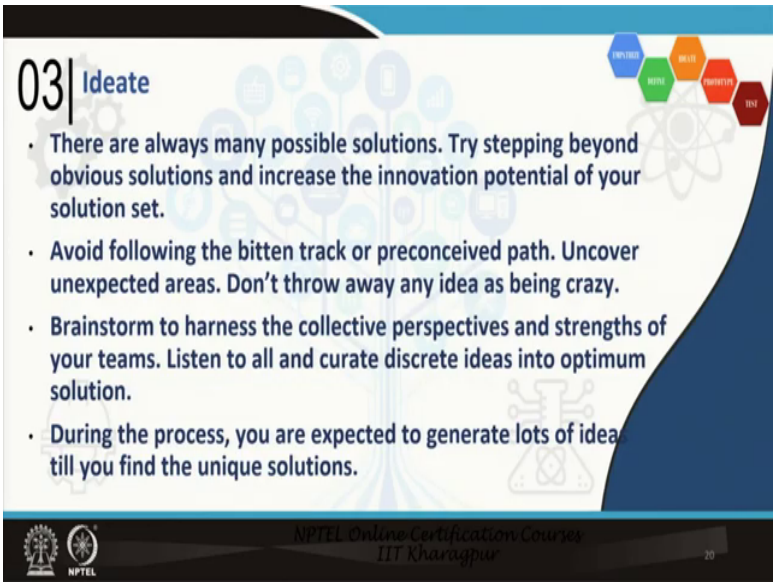

Ideation and design thinking is very unique the philosophy is that initially you have to come up with umpteen number of ideas maybe 500, maybe 1000 still you should not feel complacent. If you think that there may be more ideas, we just keep on bringing ideas not alone, but in a team anybody and everybody is encouraged to come up with ideas. They need not tell the idea because most of the people feel shy of it. So, they will write the idea on a piece of sticky note and then you will stick on the board and then somebody will collect all the ideas maybe 1000 ideas.

Then you brainstorm among the team and find out which idea is the best idea or maybe three ideas or four ideas which becomes become the best ideas. Then taking those ideas you move forward you prototypes see whether this is turn able and every now and then you engaged with the customer asked them whether this is the right method, right move forward, whether

this is going to take us to the right direction. They are going to contribute immensely in your product development process.

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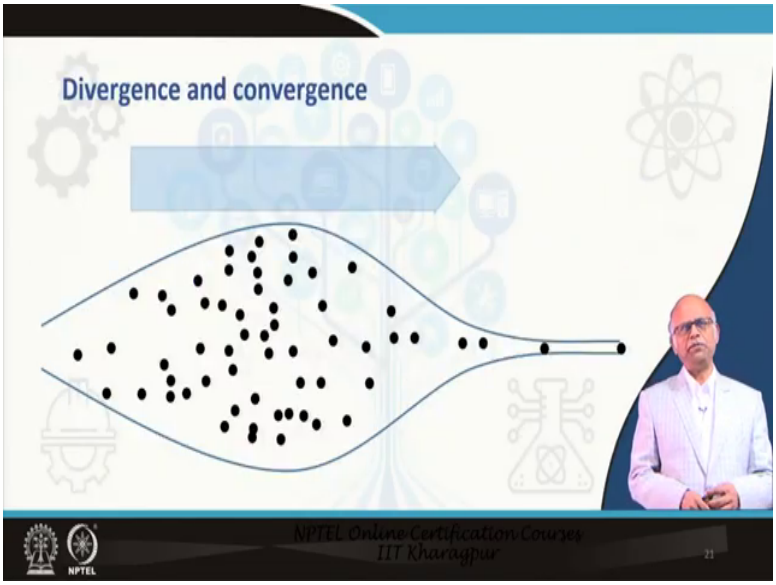

So, it is just to a depiction of divergence and then convergence. So, initially there are lot of ideas then gradually you come up with you converse to a less number of product so, diverse and converse.

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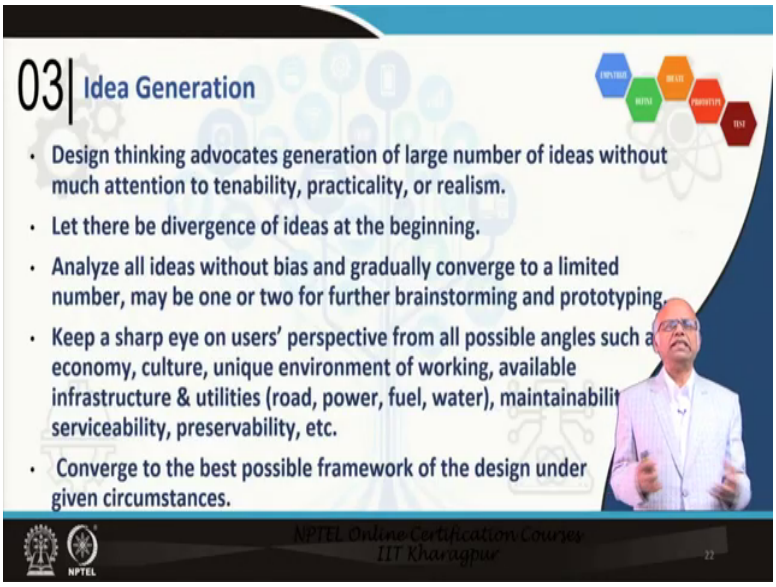

Third in the order is idea generation the previous one all actually definition. This should be defining the project defining is here we are still on the third level.

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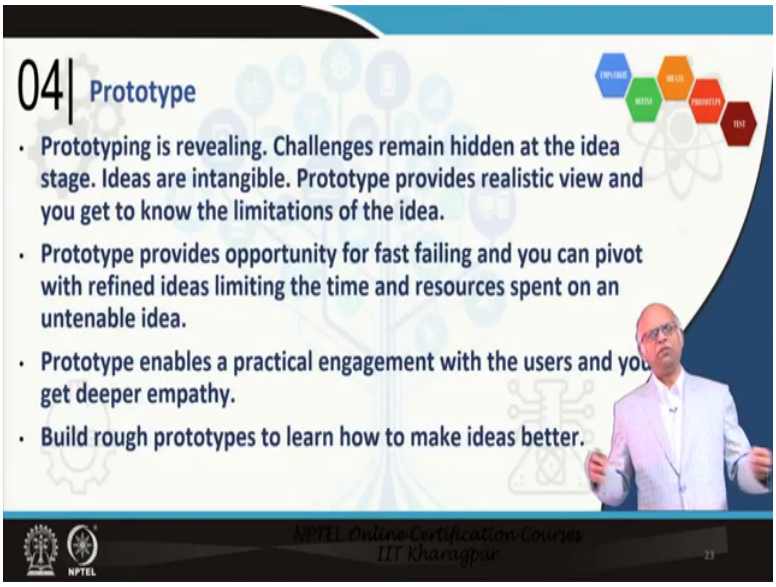

So, design thinking I have already discussed advocates that you come up with many many ideas. Then comes prototype once you converse into one, two or three ideas which you would like to pursue then it is time to prototype this also is very very important. Many a times we think that eureka I have got a solution then we start building a prototype immediately, we realize that what we thought actually is not tenable actually is not doable.

There are so many conflict that we forgot. So, we really have to continuously evaluate first of all and see whether there are conflicting components here and there as much as you can eliminate the better because prototyping cost money cost time and then you prototype to get to know other challenges which are yet to be; yet to be seen.

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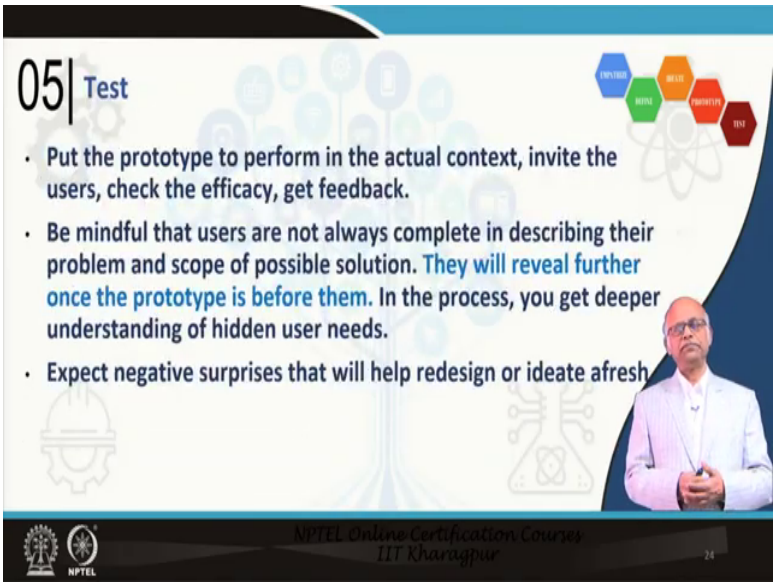

Once you have the prototype, get it validated, come back with data, look at customer, when they are validating, what they are using, where they are feeling uncomfortable, where they are feeling comfortable. They might not be able to tell you that I am feeling uncomfortable here. You have to notice that, watch that, see their body action, body language and then get to know if somewhere they need more force, they will exert more force, they will not be able to tell you that I need more force. But then if you look at their body parts, you will get to know that there is a problem right here.

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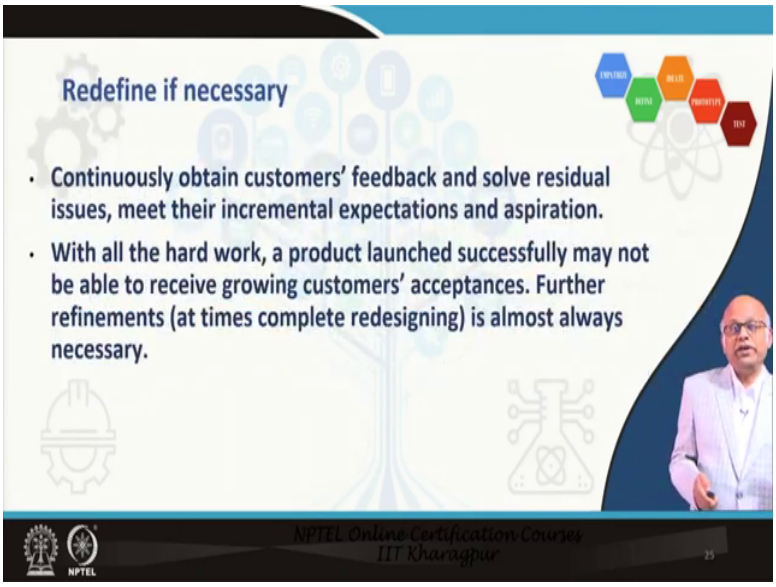

Redefine if necessary in fact, many many cases you will find that you have to come back, redefine the entire process and move forward again and again.

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So, if you want to be a design thinker, you need certain characteristic feature, you need to inculcate in your personality some features. If it is not there, it is easy to inculcate and you should try the first one and the foremost one you already know is empathy you must have empathy for everybody.

In fact, if somebody does not have empathy is a very poor quality person because he or she will not be able to understand peoples pain there will be so selfish. So, self centered that it will be very difficult for others to stay with them and this person which who is who lack of empathy, he or she also will keep on complaining others because not he will not know that it is his or her fault that is why people behaving differently.

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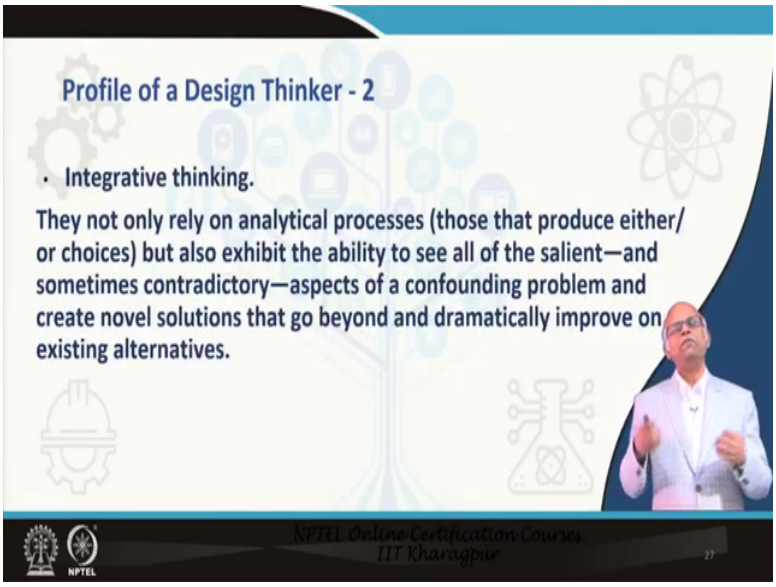

So, he or she are the more most sufferer compared to others that is why having empathy is very very important in life as a designer as well. Without being empathetic you will not understand peoples pain; obviously.

Integrative thinking is another very important part that is you should be able to think in an integrative manner in different domains in conflicting situation you are thinking about something. So, we while talking about trees, we talked about contradictions. So, if we have to really take care of the contradictions so, do something goes wrong. So, we have to have a integrative thought process that you take a holistic view about a problem and then come up with a solution will be a wonderful solution.

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Optimism, leap of faith unless you are optimistic; you will say there is no solution. It is not possible most of the people will say not possible. So, that is lack of optimism. One has to have optimism one have to be optimistic only then he or she will move forward and he or she will see the light at the end of the tunnel.

People without optimism, they will not even travel they will not even look into that look through the tunnel and they will not get a solution ever.

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Experimentalism very important. We talked about this while talking about this guy was invented that compressor I just forgot the name so, Dyson. So, Dyson did 5173 experiments to come up to the final model unless somebody's experimentalist he will he or she will give off at early stage, not move forward and then becoming a billionaire will elude those kind of people. Whereas, Dyson actually was an experimental guy experiment he follows that philosophy.

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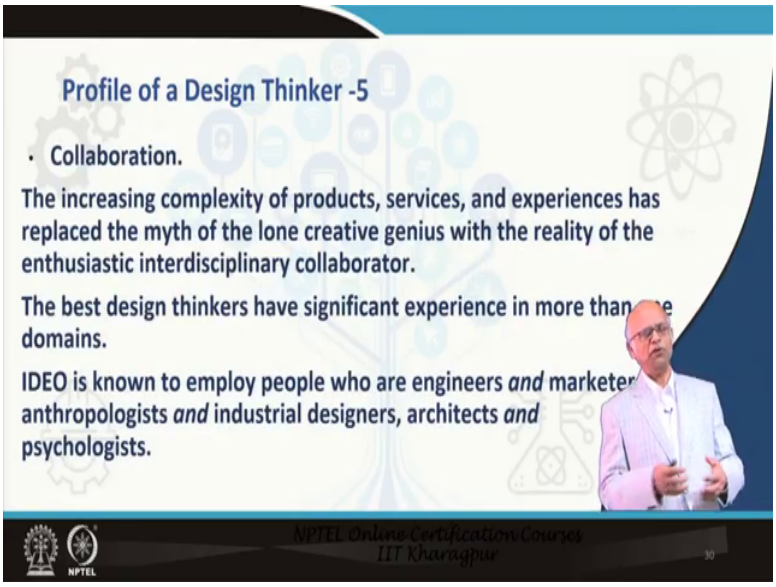

So, you have to you have to do lot of experiment to do something collaborate. You have to be a team member, you have to collaborate with many many people outside inside and then only particularly people with people who are in a different domain not in your own domain.

So, you have to collaborate with everybody; maybe you are developing something in say automobile, you have to collaborate maybe with an artist or maybe with a writer author or somebody and then you get a holistic view and a interpreters view. And then you come up with some design that will have new meaning that will that will give customers new experience.

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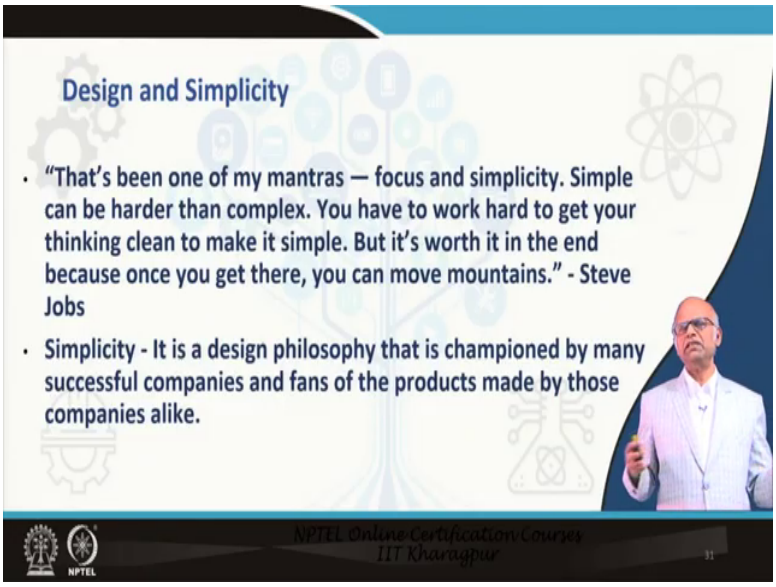

Design and simplicity, design should be as simple as possible. Mohandas Karamchand Gandhi is always referred to as a man of simplicity and also a one of the greatest designer. The simplicity and design is very important. Steve Jobs said simplicity is the most important most difficult things to do, it after you do everything after it after you give a the simplest of almost the simplest of form, it will look like even I can do it is so simple. What is there anybody can do, but nobody can do it very few can do come up to this level as long as it is that embodiment is not available very few people will be able to come up to that.

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So, simplicity is very very important. In fact, many companies because they have come up with simplistic approach to everything, they are successful. Google is one of the greatest example of simplicity in design.

Four ways to make the design simple, maintain clarity, make use of automation. That means give less pain to the people, they should not be expected to do lot of things to use your product limit options; too many options too many buttons make things so complicated. Design for a strong information sense sent meaning that information will whatever they see they look at automatically, they will realize that ok. I have to press here that is information sent just the design itself will tell them press here that is it.

So, they do not have to refer to a book telephone to a call center to know how to operate it, reduce the gulf of execution make your users see how your product can help them achieve

their goals only then your value proposition will be known to them and they will come to you to buy your product.

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Simplicity, this is this was Go Daddy website. If you are visiting this website, you will be at a loss as to where to click where to search etcetera.

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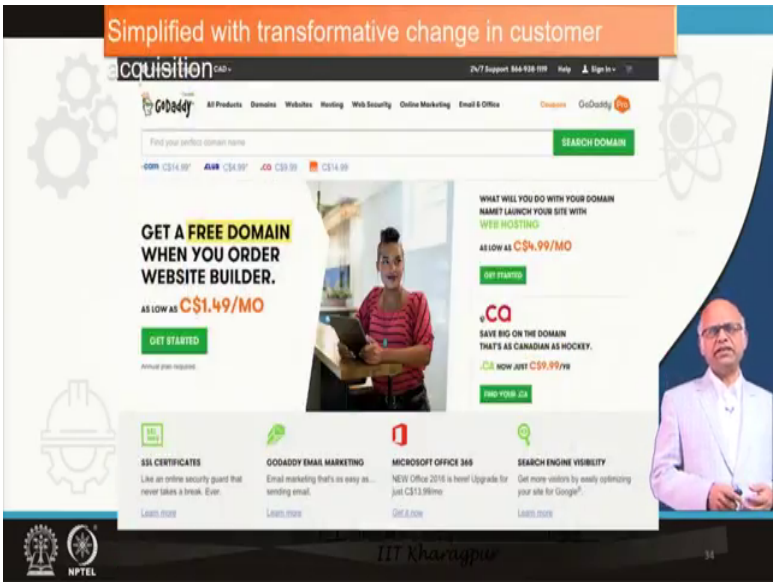

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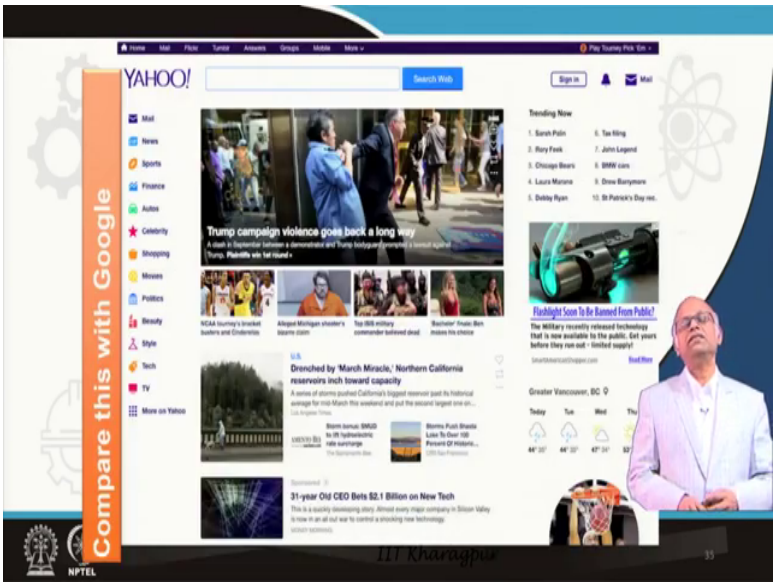

Eventually they made it simpler, this is a simplest form of this. This is Yahoo landing page, Yahoo landing page is still complex this was this was taken some time back, but look at the complexity. There are so much of information in this so, many buttons. So, many images contradict to this look at Google's landing page.

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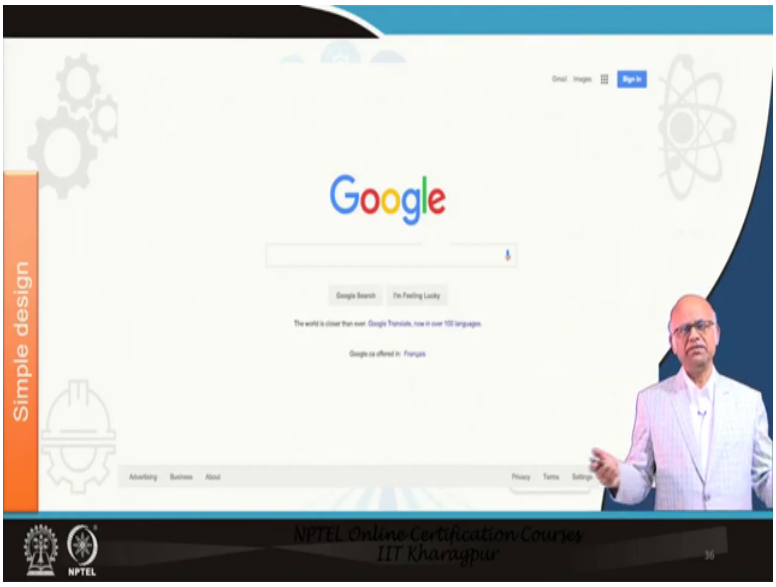

As simple as that just a search text box nothing more is there. Of course, for signing in; obviously, that is the first thing first and foremost thing that gives Google the business. So, that is the simplest thing.

Thank you very much, hope you enjoyed.