Entrepreneurship Essentials
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Module - 06
Lecture – 26
Design and Innovation – I

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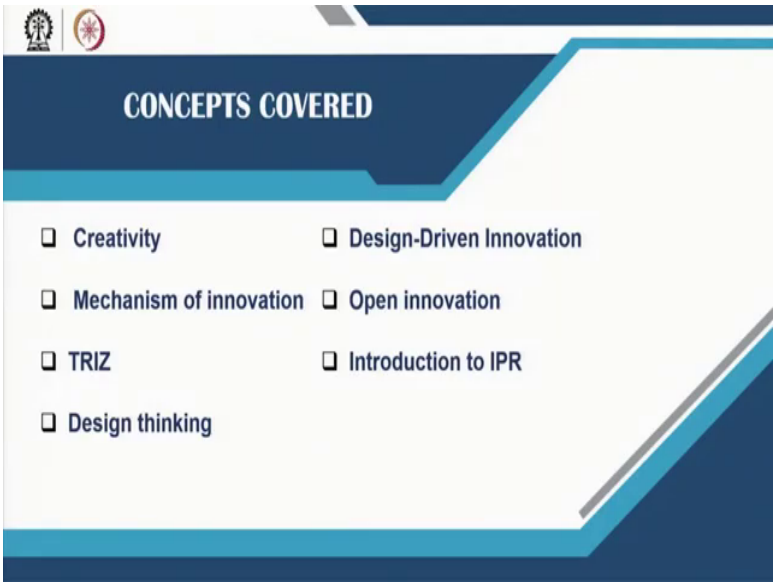

Welcome, I will be discussing about Design and Innovation in this session and few more subsequent sessions. The topics that will be primarily covered are creativity, we will try to define what is creativity and how this mechanism actually happens in the brain, then we will be talking about design driven innovation, then design thinking then TRIZ and a bit of introduction on intellectual property right.

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A detailed discussion; obviously, is not possible, but we will nevertheless talk about the salient features. Before we go dive deep into the innovation aspect of the subject, let us see how innovation and creativity is valued by top corporate houses. In an in a study by IBM into 2010, something like 1500 and 41 global CEOs regarded creativity as the greatest trade for any leader or any executives to be precise. That precisely shows the that demand for creative talent and the importance of creativity in corporate world.

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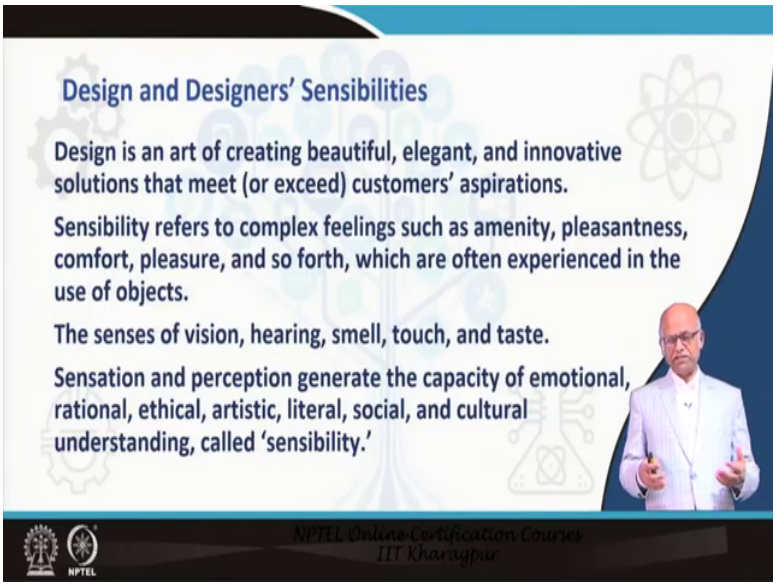

If we have to define design and designers sensibilities, design is something creative that gives us a sense of beauty that should be something like elegant innovative and it should meets customers aspirations.

So, like beauty is cannot be really defined in a sentence that this is beautiful; beauty lies in the eyes of the beholder of the eyes. So, similarly design of course, is not really so abstract as beauty, design definitely should serve purpose. Particularly it should elevate the sense of well being when a new product when I meet a new product, then I should feel that yes, this is nice in many respect. This may be from functionality aspect, maybe from aesthetic or maybe from even perception like I have perceived that this is a nicer product. And finally, there may be a little bit of a bias like suppose there is a great designer and he or she has already designed many top of the class designs.

Now, even if he she designs something not so nice or even if somebody else has designed this and it has been named after the great designer perhaps, we will say that wow this is nice. We will be like from inside our mind perhaps, we will actually like it.

So, there may be a little bit of a bias as well, but it is important to understand sense design sensibilities. It includes perception, it includes functionalities, it includes like we get some pleasure out of it. It may be social cultural, it may be anything that gives the sense of well being in our mind that is what is design. If it does not, then this not a good design; any anything can you can do something.

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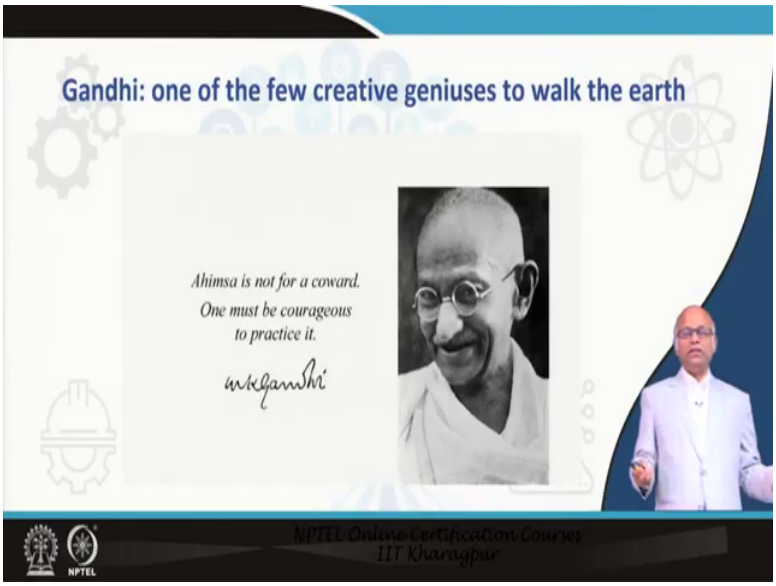

And then, but then the most important aspect or to be able to be a great designer, you need to incorporate all those elements into your design. How do you do that? And the best answer to this question is empathy. You have to be able to empathize with your subject or object

meaning for whosoever whomsoever you are developing a product, you must understand their aspiration, their challenge, their liking, disliking all of that and what they actually value.

To understand that you have to look at things with their eyes, you have to hear things from their ears, you have to you have to feel a pain by suffering the way they suffer. And here is a great example of a great designer who used empathy as the greatest or as the main tool to understand and then design something great and this is none other than Mohandas Karamchand Gandhi, who is one of the greatest designers that the world has ever seen. Maybe you are surprised to know this, but many of you might have already known because Google is full of all that. Let me explain what kind of design he did, what was the empathy and you will understand empathy by this example.

When Gandhiji came from back came back to India from South Africa, he was entrusted to spearhead the arms as struggle against the British. Then he thought who are my army or who is going to fight for me, I cannot fight alone. So, let me understand my strength or let me go back and see who are the people who are going to fight.

So, he went out and went to the rural India; that time India was mostly rural and then he met people and he talked to them about independence. Then most of the people said what is independence, we do not want independence. We want food we are two square meals a day.

Then Gandhiji gradually tried to understand the real problem, the pain that people are suffering he realized that independence comes much later. First of all you must have two square meals and then he thought ok, but then how can I guarantee two square meals. In those days, there was hardly any industry. There was no telecom, no none of the industries none of the technologies that you see around we using which you can create employment.

So, he again tried to understand the strengths and weaknesses of the country at large and he realized that India had always been a leader in textile. In fact, if you think of the think of the say time antiquity or maybe you think of year 1 and then gradually move forward you will

realize, I actually showed the data. And this was creditable data that India used to contribute about 32 percent of global economy and majority of them were from textile.

Textile was not matured at that time, but India was the leader. So, then Gandhiji realized that this is a place that we should recover revitalize and then we should put that into use and majority of the people perhaps will get employment. And then turn this money rotate this money create more wealth and then the charka came in and that actually gave rise to a revolution altogether. And that is how people many people got employment rest is history and you all know about that.

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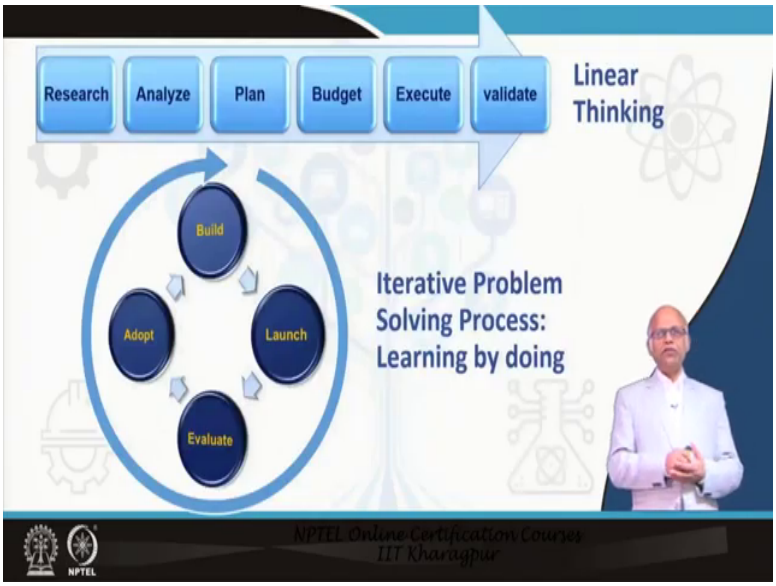

Now, for inventing there may be linear thinking, there may be alternative problem solving. Linear thinking is you define something you set an objective that I am going to reach at this place. So, you have some fair idea that this is the outcome; if I start from here gradually step

by step, I go there. Whereas invention actually something that that does not exist you this you invent something some technology that does not exist.

So, if you think of an objective, then perhaps invention an objective or invention and plan perhaps is an oxymoron. Meaning if you have to plan something, you are going to discover something rather than inventing something.

So, invention is through iterative process. You start with a pain then try to ideate, make something, get feedback like a feedback loop like the validated learning that I discussed in the previous two previous sessions. It is like that it is a validated learning process iterative process through which you will reach to a place which will be much better than what you start with.

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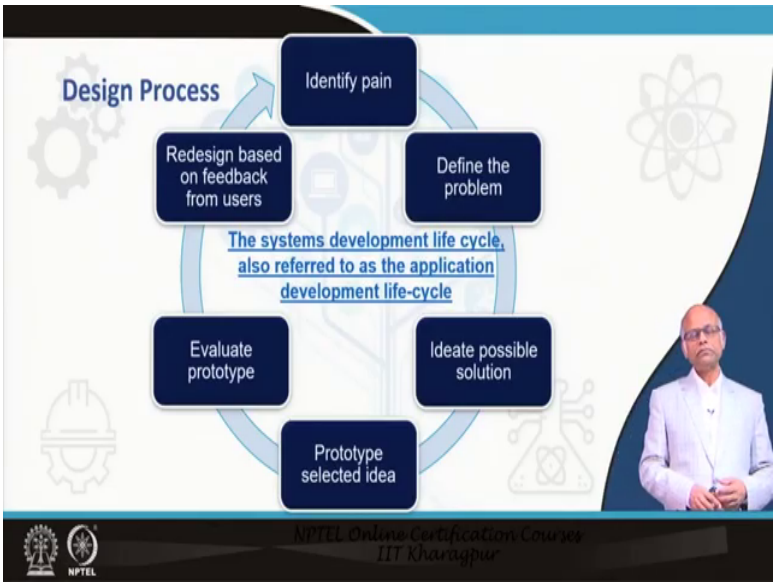

But then you may not foresee that at the beginning. Here is more number of steps in this validated learning process.

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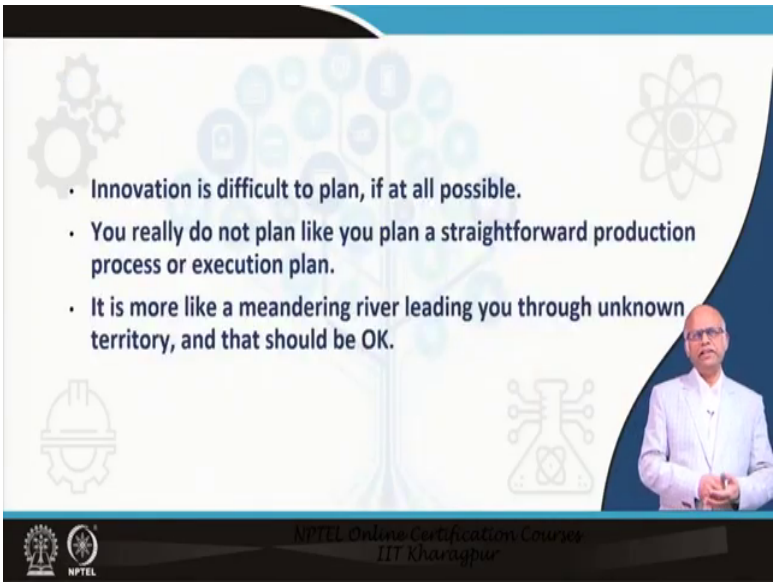

So, invention is more like the process of invention is more like a meandering river, it is leading you do not know where it is leading you to, but then finally, when you reach somewhere or finally, when you get the product that is validated by customer that is going to be a groundbreaking wonderful product or service.

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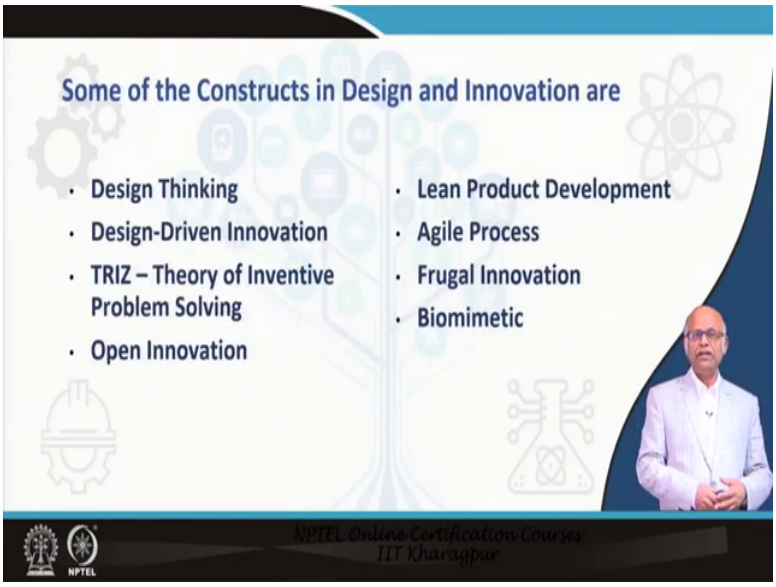

Luckily for us we have some tools or some constructs for helping us in this process. It is not so uncertain because innovation and invention is so uncertain. So, researchers have actually tried to come up with some tools and some construct that if you use them, then in a in a step by step process it is almost like it is almost like combination of linear and iterative process together that you go that to invent something.

Design thinking has been adopted by almost all corporate houses of today in their RND. Design driven innovation is another emerging topic, we will discuss about that. TRIZ theory of inventive, inventive problem solving emerge from Russia, but then many countries have already adopted. Open innovation has been there for a while, lean product development we have already discussed as, agile process discussed, frugal innovation well be talking a little bit about that and then biomimetic. Copying natures, talent; the way nature actually invent

innovate and optimize everything. We can actually copy that and then we can we can develop new product or service that will satisfy people because it is something that came from nature.

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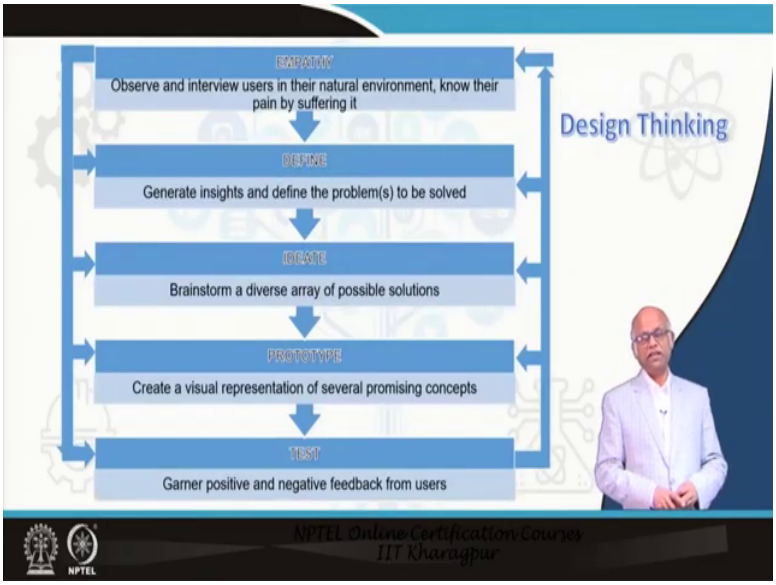

We will have separate session on design thinking, but here is just the introduction part of it. Design thinking is a kind of a feedback process. It is regarded as people centric because at every step of the roadmap you onboard, the actual people and then they validate. It starts with empathy.

Empathy is the central part of design thinking, new age product development. In fact, empathy has always was always there since time antiquity. But then design thinking is a formal name of this whole process and it is a systematic way of teaching adopting the process of innovation.

So, empathy meaning you observe, you understand, you feel the pain of people from them by suffering itself. Then once you understand the pain, pain comes from within and then it becomes easy for you to define the whole problem; the gamut, the size, the parameters, the depth and breadth of the problem.

So, once the whole problem is understood, then you start ideating as to what can be a possible solution. You ideate umpteen number of possible solutions and then eventually you select one, two, three of possible solution which are which hold promise and then you start prototyping. Once you prototype, you realize whether your hypothesis about a product is actually right and whether what you thought is getting translated into a product that you dreamed how.

And then once you have a prototype, take it to customer, the actual user; they are going to give you data as to what they like what they do not like whether it is satisfied, what else needs to be done to make it more suitable for them.

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And as I said, it was there since time antiquity. There was a there was this great artist Leonardo Da Vinci, he was he used design thinking in everything that he did whether it is a great masterpiece of art or various technologies. He always had the had had the object in mind and then he iterated many times to come up with something that actually or serving to the to the target audience. His diary is testimony to this philosophy that he iterated and reiterated; he made many things and then discarded and eventually when he was satisfied that yes this is the final product; only then he made the final version of the thing.

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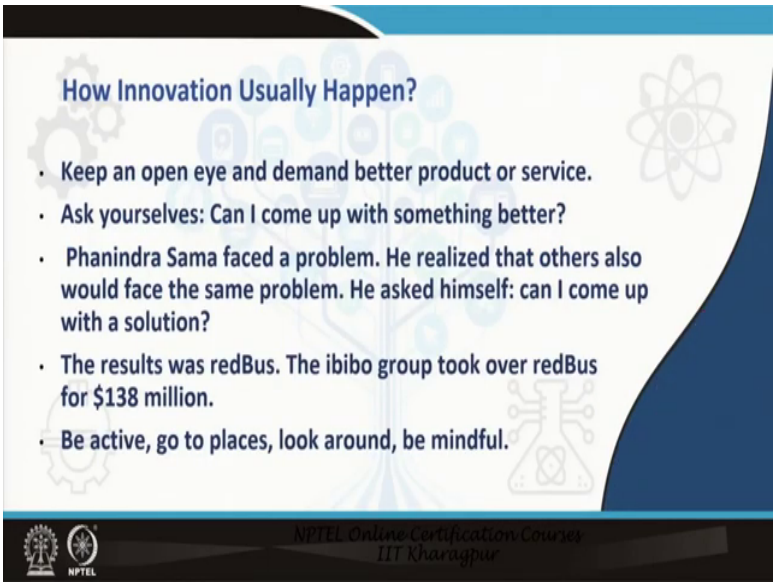

Otherwise he applied design thinking philosophies in many things; most of his invention. Now how does innovation happens usually? Meaning if you think I understand that I should empathize and then I should start using design thinking step by step and then come up with something.

But, where to start? One should start primarily by getting engaged in doing something. You keep on doing, you keep on interacting with people; you look around and then problem will be visible to you. It is not that you read books or you ruminate or meditate and then problem; problems will arise in your mind, it is not like that.

You have to really remain circumspect meaning that you have to have a 360 degree view about this world and wherever you go just look around, but then keep a sharp eye on things.

Do not compromise; if you see if chances are that if you see somebody suffering, maybe you sympathize [laughter] this man had this pain have this pain.

You may not question as to this man has this pain, can I really come up with a solution. Here is an example. Phanindra Sama, he was trying to book, he was trying to travel from Bangalore to Hyderabad. When he arrived at the bus stand, he found there was no bus and all the bus that are likely to come later are all overbooked.

So, there is no way he can travel from travel to his place. Now he was angry he was annoyed and he was thinking what is this system that I need to travel and there is no bus and then he started thinking. He started thinking as to what should I do, how do I go there, but rather than complaining that; that is what we do. We complain, we go to we shoot a letter to maybe the Chief Minister or Transport Minister or something.

He actually sat and started thinking as to what can be a solution to this problem. This is a problem this is a pain that I am suffering from, many people are suffering from the same problem; it is not just me. There are thousands of people who are suffering from the same pain.

So, if there is a solution to solve all this problem then so, many people are going to be benefited. So, he build a software called redBus or a portal where people could pre book tickets and then the journey was guaranteed, a seat was guaranteed and eventually he sold the company for 138 million dollar.

So, be active; go to places, look around, be mindfully. There are problems; just do not complain, complaining is because people need to be told that they are not doing what they need to do. But most more importantly if you find a gap between what is necessary and what is available, then focus on the gap and then try to find a solution to bridge the gap is the way forward.

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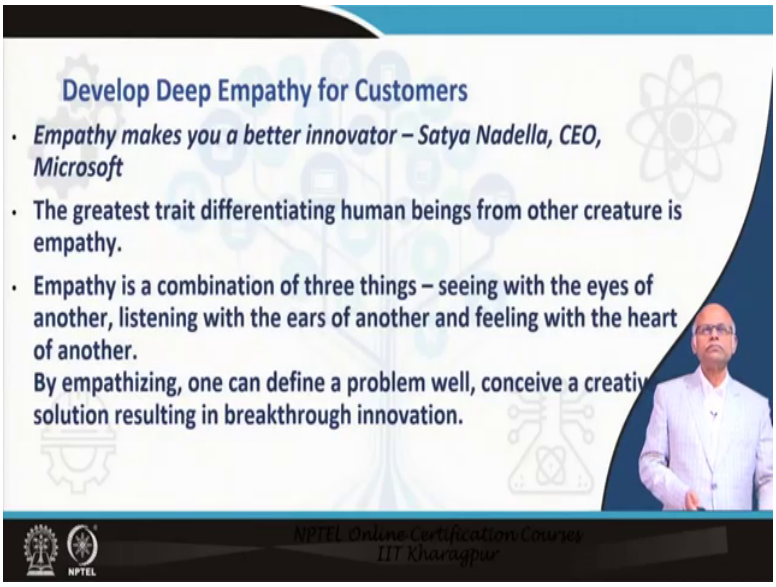

Develop deep empathy for customer. Nothing can be more important than empathy for designing anything developing anything. Look at what Satya Nadella has to say “empathy makes you a better innovator”. The greatest trait differentiating human beings from other creature is empathy.

So, if somebody cannot empathize with others, we have to doubt their integrity their quality of human being. Empathy is a combination of three things; I already mentioned seeing with eyes of another, listening with ears of another, feeling with the heart of another. So, feel the pain the heart or another.

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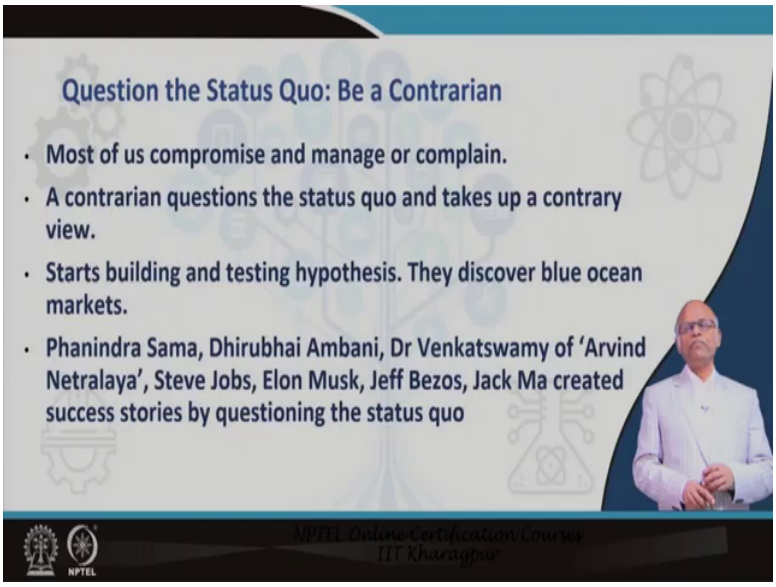

By empathizing, you can actually understand the pain better. If you understand the pain better, you can define the pain better. If you define the pain better, you can ideate it better and then you can come up with solutions and then you can prototype and there is a wonderful product; groundbreaking product and successful company.

So, for questioning meaning rather than complaining; if you have to find a solution, then you have to question the status quo. That there is no bus available or all buses have booked. So, what I could have done, I could have booked a ticket well in advance, but there is no system to book. So, question the status quo what is the system, present system? Status quo is the present existing system.

So, question that; can there be a better present system or better system be a contrarian. What people think people will immediately go berserk and then perhaps they will start complaining

shooting letters. After letter, following up, then write a column perhaps, but then that is not going to take us anywhere may or may not be. The best way to be a contrarian.

So, think differently rather than complaining think of getting a solution. Normally contrarian questions the status quo and takes up contrary view. Starts building and testing hypothesis, they discovered blue ocean market. Like Phanindra, he came up with a new product; there was nobody in the marketplace.

So, that was a blue ocean market and he had monopoly in the market and that is how the company was sold for 118 million dollar in the very shorter span of time. So, Phanindra Sama, Dhirubhai Ambani, Dr. Venkataswamy of 'Aravind Nethralaya', Steve Jobs, Elon Musk, Jeff Bezos, Jack Ma of Alibaba. They all created success stories by questioning the status quo. By questioning the status quo, they came up with new solution that disrupted the existing system and that brought so much of utility, so much of convenience to a whole of people to all the people almost all the people.

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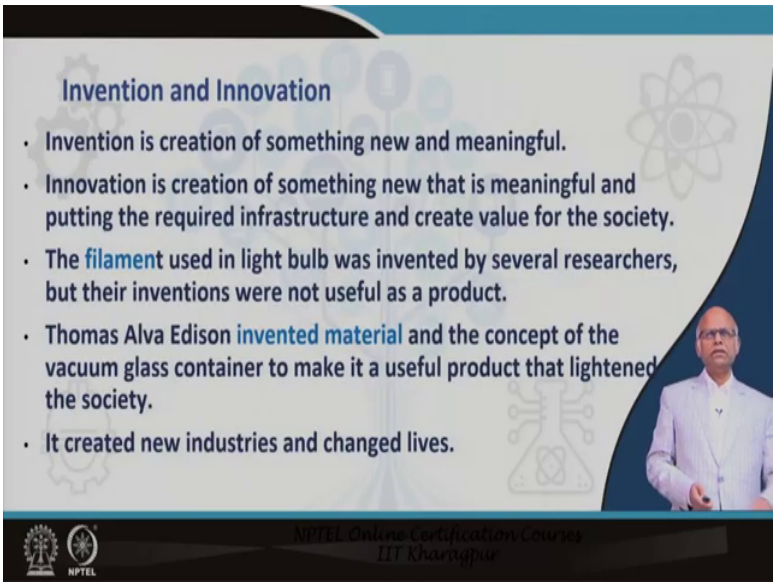

Invention and innovation we have already made the distinction, but some little bit like invention is create creating something that is not existing something meaningful that is not non-existent. Innovation is to put it for the well being of the people of the target audience. So, you need to put infrastructure, you need to bring, you need to refine the technology and then make it commercially relevant that is what is innovation.

Like many people came up with filament; filament for incandescent lamp. There were almost 100 patents before Thomas Alva Edison filed his own patent. He came up with new material and came up with the vacuum tube concept that gave incandescent lamp a long life.

Before that it was just a blip that filament would be just glow for a second or so and then burst whereas, Edison give it in a shape that will sustain for hours, days and months. So, it

became relevant for public use and not only that he put the he laid the cable line, he put generator for generating the power.

He founded general electric which is producing the power; distributing, manufacturing the bulb and people were happy; we are happy. It created new industries and changed the life of people.

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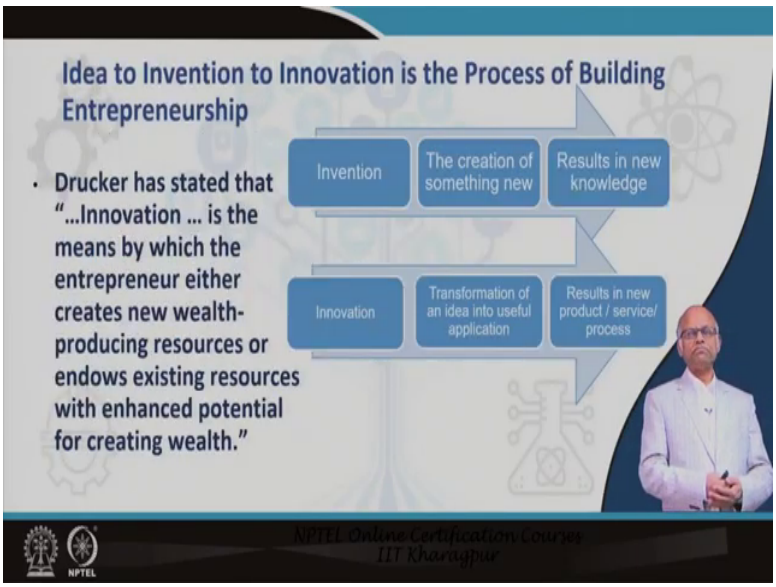

So, here is the difference. Drucker said innovation is the means by which entrepreneurs either creates new wealth producing resources or endow existing resources with enhanced potential to create wealth for everybody.

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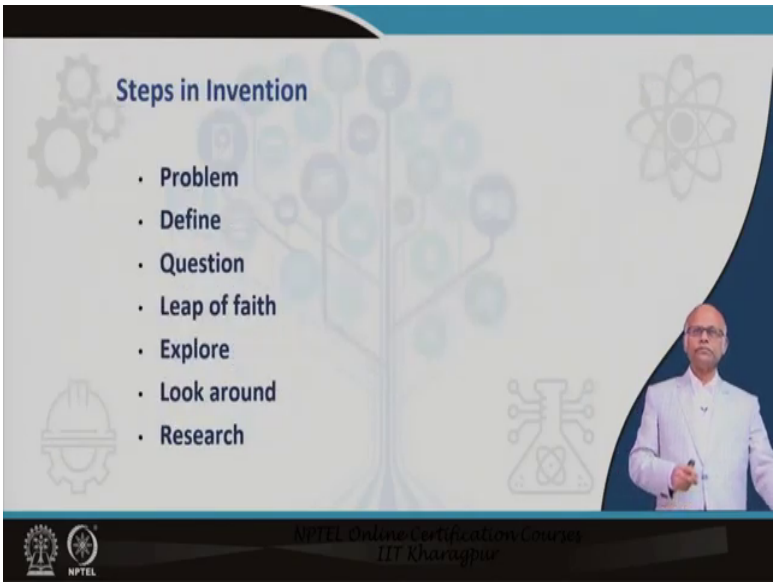

Steps in invention; it is very simple, but we will discuss it moving forward. Leap of faith is something among them.

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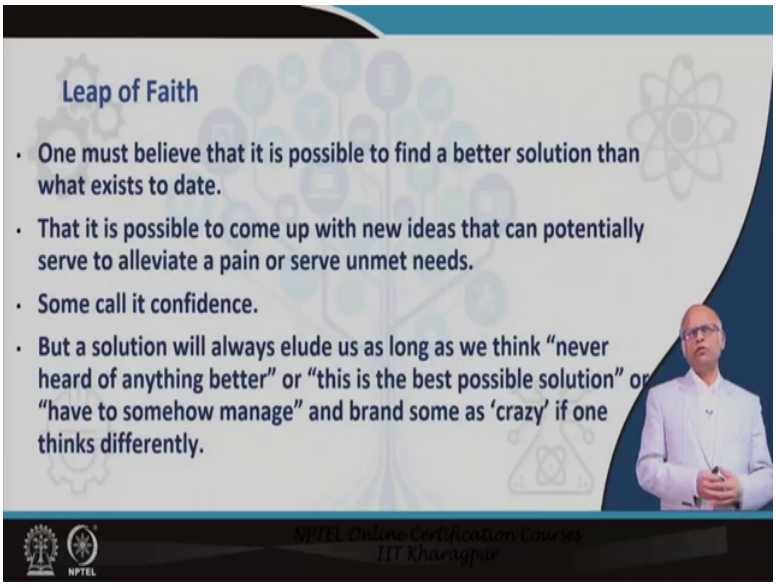

So, let us discuss what is leap of faith. I discussed it in previous some previous session. Leap of faith is very important for invention. It is like this. When we encounter a problem, we normally complain that is what I have been telling.

Now, suppose you come up with some idea and tell to tell it to somebody. Most of the people will say I have never heard about it, what is this; never heard. Even we may think when we think of, we when before starting to think of a solution, this various thought prevents us from even trusting our instinct that a solution is possible. The belief that a solution is possible is a leap of faith.

So, when there is a problem, the first step to start with is a leap of faith. So, you must have a leap of faith that there is a solution or there is always a better solution. The term best solution does not exist. There cannot be a best solution possible for anything. There is always a better

solution and that is a leap of faith and we start with the leap of faith that there is a solution first of all.

So, we must make effort to find it. Some call it confidence. Whether you call it call it confidence? You should not. Start by thinking that I have never thought of this kind of a solution or something that is the job of naysayer and you should never interact with them about innovation. And I have already discussed how to identify problem and how to find solution. Identifying problem as I said you must engage, you must go out and work.

Suppose you had never been in a kitchen perhaps your mom or somebody or your wife perhaps cooks for you, now try to go into the kitchen. Use the frying pan or something to fry something.

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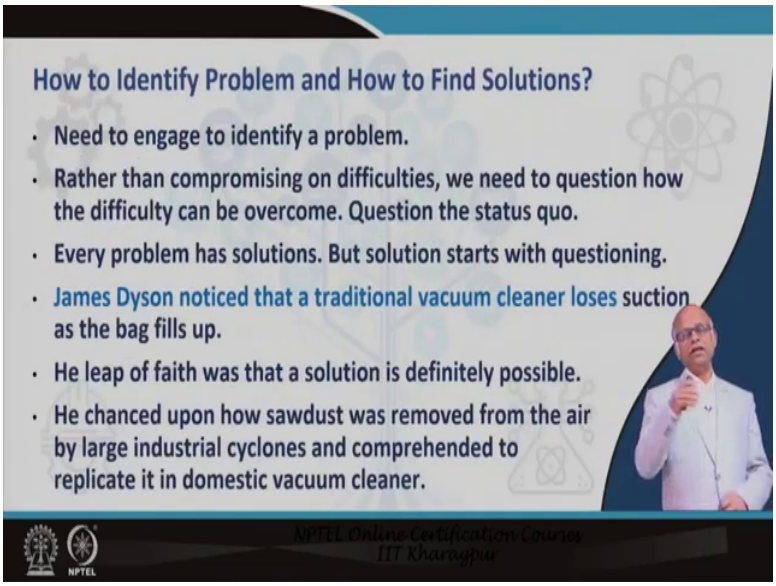

And suppose it spills out and you come up with some kind of a pan that is slightly curved inward. So, that even if you churn it vigorously it will not spill outside and you will find a eureka moment. Wow! This is a new invention that I can come up with a new pan from which anything that will fry or kind of churn vigorously, it is not going to spill outside. Unless you do it yourselves, you will never ever invent this. So, you have to do, you have to act and then have a leap of faith, then come up with ideas eventually prototype validate.

James Dyson noticed that a traditional vacuum cleaner loses suction power as it gathers west or dust. He thought there has to be a solution that was his leap of faith. There this vacuum cleaners whichever vacuum cleaners are available, they have this problem; there must be a solution. So, he started thinking, he put this problem at the back of his mind or precisely in his subconscious that he started churning this idea. If solution is possible, I must find a solution. So, his leap of faith was that his solution is definitely possible.

Now, as he was churning the idea in his subconscious, he was kind of roaming around and sometimes somewhere he saw a sawmill where they were using a sawdust catcher. There was something like a cyclone separator, it was an industrial cyclone separator and it was sucking all the sawdust and it was throwing it in a bag. So, it is a almost like a continuous process, a never ending capacity to hold dust because the idea was in his at the back of his mind.

So, he realized that there is a possibility that this solution can be replicated in a vacuum cleaner and then a new product was invented by him, the Dyson Vacuum Cleaner.

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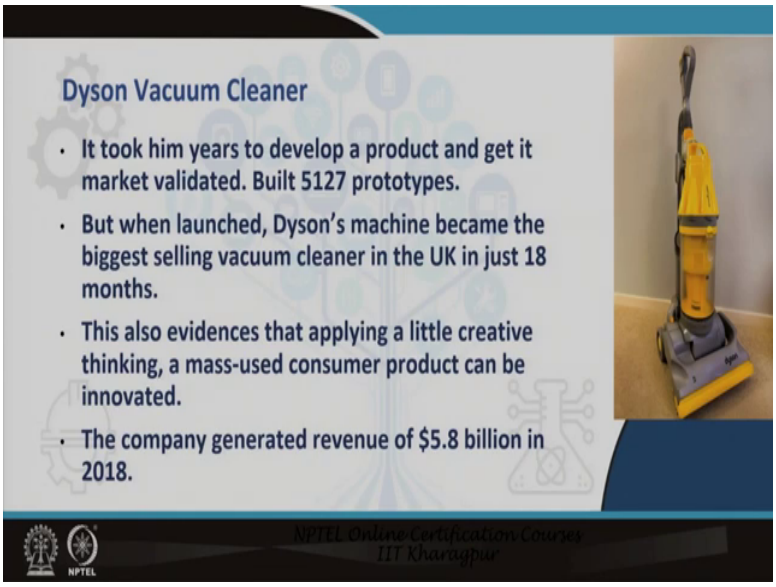

It took him years to develop a product and get it market validated. He built 5127 prototypes and then when it went to the market, it was a wonderful success. The company generated revenue to the tune of 5.8 billion dollar in 2018 and his personal net worth is about 10 billion dollar. He was just a mechanic before inventing this in a company.

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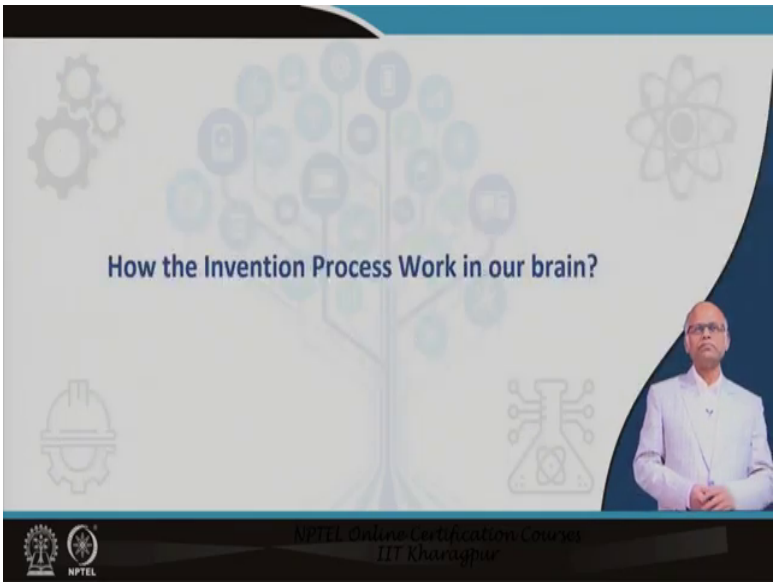

How the innovation process work in our brain? This is going to take some time. We will continue in the next session.

Thank you very much.