Strategies for Sustainable Design
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Lecture 32
Thinking the Unthinkable: Need for Innovation in Design Process

Hello everyone, in today's lecture we will discuss about Thinking the Unthinkable: Need for Innovation in Design Process. What is innovation? Innovation this word you may be hearing for a quite some time now. It is in the world; it is in the trend and everybody is talking about innovation.

Well, innovation is a process where we come up with something very, very novel, something very, very new; a fresh approach which gives a significant improvement from the existing scenario to the renewed scenario to the new scenario. So, it is if you want to whatever condition you are in, wherever whether it is about design, whether it about improving a process or a product or a service or a business model or improving even anything in and around your thing; you can you can look around, just look around.

So, around wherever you see something some opportunity, there is some issue or something. And if you try to improvise, if you are trying to improve upon whether something very, very out of the box solution; something very, very a novel in terms of approach or adoption or improvement; so that process generally is known as a innovation. Though there are some other definitions also, some other interpretations also; but innovation is an approach which improves significantly with an out of the box solution. So, this is what we mean.

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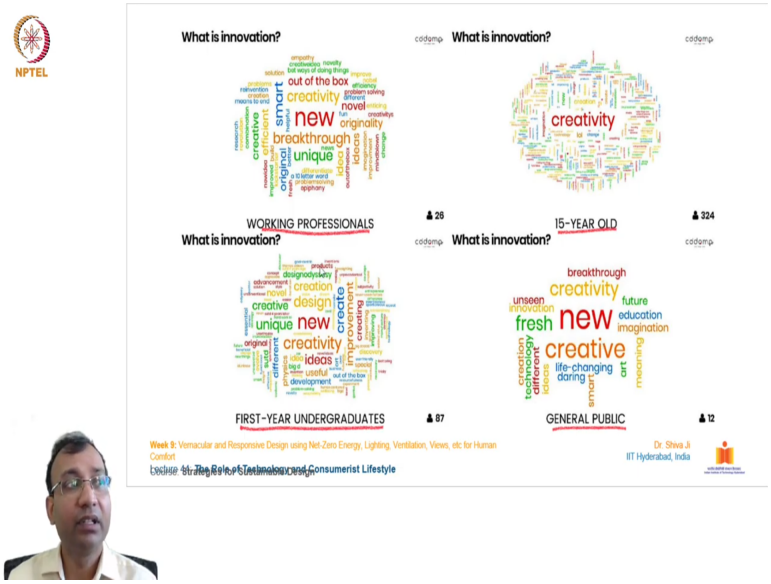

Let us see what others have to say about what innovation is. So, there was this survey conducted by this company over here, and they spoke with the working professionals 15-year-old kids; and first year undergraduates and general public. So, what do they found, so they have given in a form of a word cloud here? So, this the terms you can see over here, the keywords you can see over here, that define understanding of innovation with this set of a people.

So, working professionals associate more with new, breakthrough, unique, creative, out of the box, smart, original, efficient creative, originality, creativity, enticing, improvement, empathy, novelty, solution, problems, reinvention, creation, means to end, creative, epiphany, differentiating, problem solving, ideating.

So, ideas, so imagination, improvement; so, these are associated words, which this set of a people associated themselves with. Secondly, if we see this is a 15-year-old this group, what they associated with the majority of them spoke for this creativity. You know creation some said even Lol; so new, so imagination, so these are the common words you can see.

For the first-year undergraduate students new, design odyssey, creative, unique, ideas, useful development; and in the last one with the general public, the breakthrough, creativity, new, creative, future, education, imagination, meaning, smart, life-changing daring, ideas, different, technology, creation, fresh, unseen, innovation.

So, these are the associated keywords. You are not wrong if you are if you also have come up with these words in your mind, when I am at the moment I spoke of this word, this magic word innovation. So, these are all true, it depends on the kind of circumstances and the context in which you are going to innovate and you are going to innovate what, so it depends on that. So, all of this could become qualities of any innovation which one can think of.

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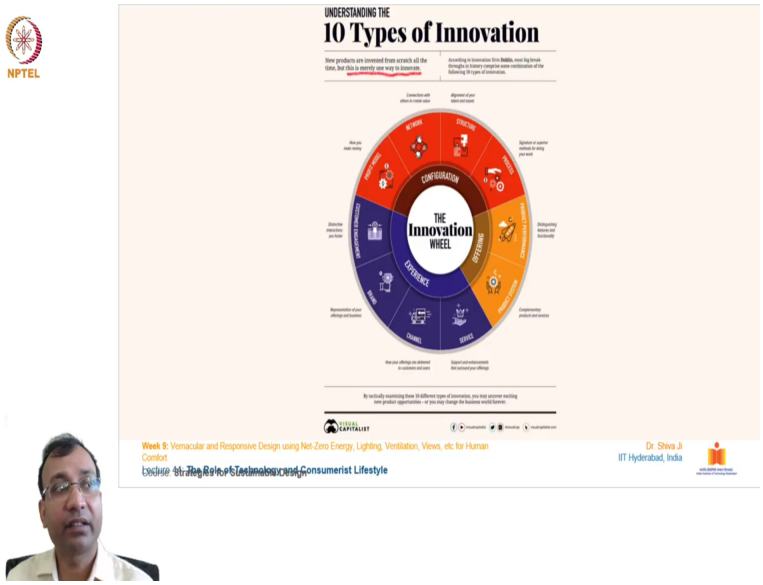

So, let us see some more understanding about innovation how this innovation is broken down into several processes and procedures. And organizations institutes, even companies or even laymen even grassroots workers, students, children anybody can participate in these innovative challenges. We will see some real life examples in this lecture. The very interesting examples I have tried to collect and deliver it to you. So, anybody can think of such interventions in their spheres of their work.

So, in this table if you see the elaboration over here is about understanding the 10 types of innovation. So, what are those? So those are divided into 3 major components; those are a configuration based, offering based and experience based. So, what is in configuration based if you see; a profit model networking structure, process; in offering this is a product performance, product system and in experience aspect. It is about a customer engagement, brand, channel, service.

So, you see these are domains, which are domains which touch almost anything and everything. They are touching products, they are touching services, they are touching business model, value systems, experiences such as experience of any service. For example, if you are going to a retail store, so what kind of experience can be given to the visitor, can be given to the shopper to enhance the experience to meet the expectations in very novel and interesting ways; so, well innovation is there everywhere.

So, if you see here in the branding, so how we are in today's time we have discussed in the consumerism chapter. We are surrounded by information overload, we are surrounded by n number of products for who are promising; which are promising to fulfill our n number of requirements, even if we do not have the requirement, they are enticing us to feel that urge to buy that product.

So, they are all taking help of legacy innovation as a process, and they are trying to register a growth and development in their business profiles. Further, even in networking, even in profit models, so everywhere innovation we will see in the next slide.

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So, this is where I have taken some lecture examples from a TED; you may be aware of this platform. So, TED is a platform, you may be aware of already; you may have seen some videos, some very inspiring interesting videos they prepare and present with the audience technology, entertainment and design; so, this is what it constitutes for this world a TED. So, I have taken

these next few slides from a TED website; where they have spoken about how to fuel innovation, how to ignite innovation in the minds. And which are those areas, which are those domains and what are those times; how it can be a spur at any given time, at any given location by any person. So, some examples, some lectures examples.

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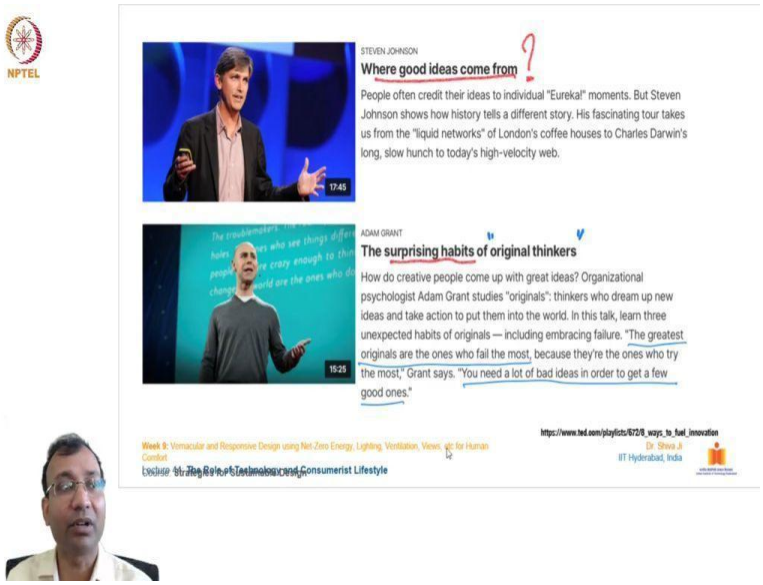

So, these are just examples, I am not elaborating on these; videos are copyright of TED this platform. So, it is recommended that you visit this trade platform search for these videos and watch them; because it is not possible also to show these videos through this lecture. But, they are really inspiring, there are we really will open up our understanding all again how many ways innovation is possible; and even how we can participate for an innovation at our own places; so this is very interesting.

So, the first one here the presenter talks about the presenter Steven Johnson; he talks about where good ideas come from? So, people often credit their ideas to individual Eureka moments. But, Steven Johnson shows how history tells a different story. His fascinating tour takes us to from the liquid networks of London's coffee houses to Charles Darwin's long, slow hunch to today's high-velocity web.

So, in this video the presenter the speaker talks about innovation anywhere it can happen. It is not just a scientist when they stumble upon any extraordinary finding or some innovation. It is not the innovation is not limited to that only; it can happen even with you, while you are relaxing

somewhere in the you are taking, you are soaking yourself in sun, you are reading a book, you are taking a bath, you are pondering over something or any any moment.

So, innovation is very, very spontaneous, innovation is very, very natural; so you have to be a cautious and aware of what is going on in your own brain. You have to keep focusing on your thoughts, what are the thoughts coming and how you can transform those thoughts into some kind of a reality. So, that is that is the process which you can associate; you can call it as innovative process.

The next video on this presenter Adam Grant; it talks about the surprising habits of original thinkers. So, in this one how do creative people come up with great ideas? Organizational psychologist Adam Grant studies originals thinkers who dream up new ideas and take action to put them into the world.

In this talk, learn three unexpected habits of originals-including embracing failure. The greatest originals are the ones who fail the most, because they are the ones who try the most, Grant says, you need a lot of bad ideas in order to get a few good ones. This is very important, this is very important to attempt; and while you are attempting anything and everything, even in your studies, even in your projects, even in you are an entrepreneurship anywhere, you must attempt and while attempting there are high chances the person may fail a few times.

And it is very, very normal; there is nothing wrong in failing. Because if you fail a two three time, obviously it is for a sure that you will be performing much better at the next time; and definitely you can come up with you can generate some idea finally. You remember the Thomas Alva Edison he that a single scientist had the hundreds of patents in his name, and how he did though? He keep on working, he keep on focusing on his work n number of times and he came he kept coming with new ideas.

He at times he has worked on very weird ideas also, which we can our discard that is just a silly idea. So, the silly ideas, the weird ideas have the greatest potential; they have this greatest content of innovativeness or the freshness. If they are able to realize, but sadly we do not try; we feel discouraged after a few attempts and that idea dies. So, this is very important to understand this process over here to fail in order to succeed in the next term; so, it is very important.

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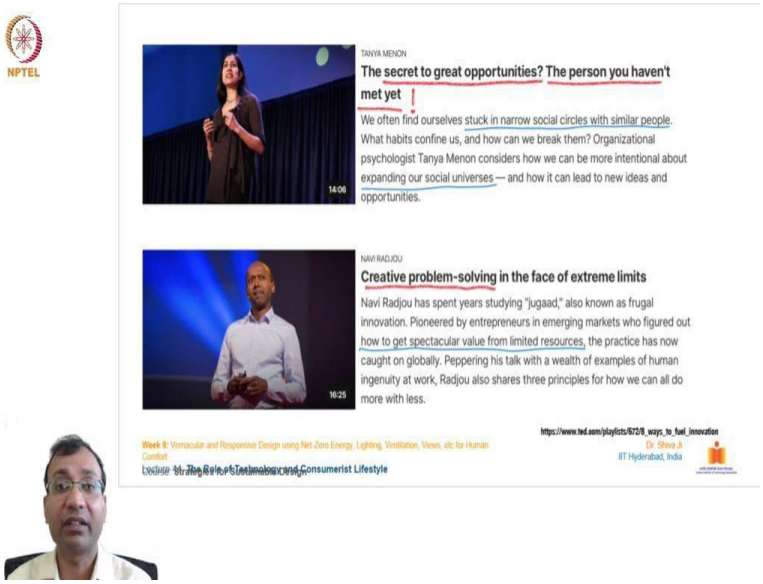

In the next of this lecture Tanya Menon, she talks about the secret to great opportunities, the person you have not met yet. We often find ourselves stuck in narrow social circles and similar people; what habits confine us and how we break them. Organizational psychologist Tanya Menon considers how we can be more intentional about expanding our social universe; how it can lead to new ideas and opportunities.

Well, this is also very important point, because mostly our peer group remains the same for a longer period of time. And you know meeting people becoming part of the melting parts; you may end up with some fresh ideas for your research, for your project, for your entrepreneurship, for your business model or anything.

So, meeting people, interacting with them, sharing the ideas, catching the ideas from the conversations is very important. So, for that one must not limit himself or herself to the group of people whom you are comfortable with. But, you must venture out, you must meet new people, must interact, you know must share with the new people. And it is highly likely that you may end up striking a new idea.

Why do we go for conferences? Why do we organize conferences? Why scientists and engineers and designers and architects keep moving from a place to place? Why do they interact with people? Why do they go and see different places? Because by seeing by this interaction by this experience, there are high chances that you will come across some new ideas.

So, these are the inputs I am trying to give you, how you can be part of the whole process of this innovation; so, it is very important to understand these. So, you must refer these videos in your leisure time; because you I am sure, I am pretty sure you will find them inspiring. The next talk by Navi Radjou; it talks about the creative problem-solving in the face of extreme limits.

Navi Radjou has spent years studying jugaad, also known as frugal innovation. Well, I am sure some of us are already aware of this word jugaad. Pioneered by entrepreneurs in emerging markets who figure out how to get spectacular value form limited resources; the practice has now caught on globally.

Preparing his talk with a wealth of examples of like human ingenuity at work. Radjou has also shared three principles of for how we can all do more with less. So, obviously working within the resources, working in the limited resources; this is one of the traits of us, in our country majorly we are not at, our per person GDP is relatively very low, we have studied in the previous lectures. But, still how the Indian people have learned to cope up with the circumstances? How they have learned how to thrive in the challenging circumstance? So, this is one of the important and innovative traits to survive.

Because, you know how to navigate your ways. You know how to deal with circumstances. How to deal with the scarcity. How to deal with the limitations of resources or availability of resources and things that. So, availability of resources should not be a barrier should not be the limiting thing for you.

So, do not think of yourself as that you do not have access to this and that; and that and that; but, you can innovate in any given circumstances. So, there are some examples I have kept in this video; in the next slides they are waiting for actually, I am waiting to show those examples; you will get to see how the people from a grassroot ravel they have thought like a novel, where they have come up with interesting examples.

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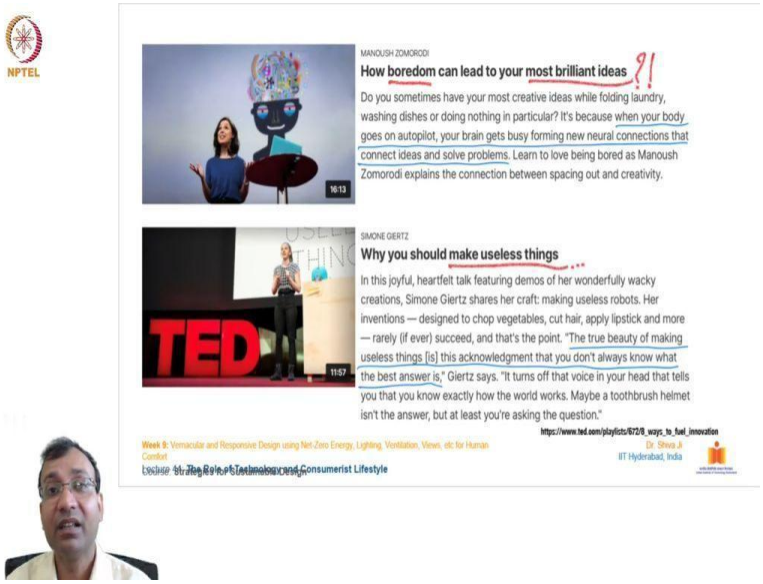

So, the next set of lectures, this is from Manoush Zomorodi. She talks about how boredom can lead to your most brilliant ideas. Do you sometimes have your most creative ideas while folding laundry, washing dishes or doing nothing in particular or maybe while you are doing a bathroom singing in your bathroom. It is because when your body goes on autopilot, your brain gets busy forming new neural connection that connect ideas and solve problems.

Learn to love being bored as Manoush Zomorodi explains the connection between spacing out and creativity. So, there is no particular time that you switch on your brain and start innovating; or you will switch off your brain and stop innovating. So, you grow, by your brain keeps working on the time as long as it is conscious and awake. So, any moment even if you are sitting idle somewhere, you can come up with novel ideas.

Next by Simone Giertz, why you should make useless things. In this joyful, heartfelt talk featuring demos of her wonderfully wacky creations, Simone Giertz shares her craft, making useless robots, her inventions designed to chop vegetables, cut hair, apply lipstick and more rarely if ever succeed and that is the point. The true beauty of making useless things is this acknowledgment that you do not always know what the best answer is.

Giertz says, I turn off that voice in your head that tells you that you know exactly how the world works. Maybe a toothbrush helmet is not the answer, but at least you are asking the question. Well, the idea over here is the point which I mentioned in the beginning, they do not get stopped;

do not get bobbled by the wacky ideas or the weird thoughts or silly ideas; because they have largest potential.

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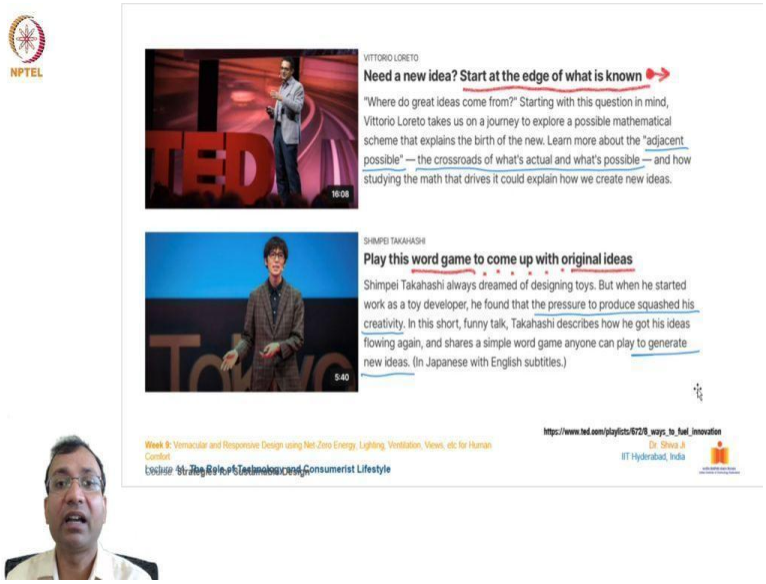

The next talk about from a Vittorio Loreto; he talks about; need a new idea? Start at the edge of what is known. Where do great ideas come from? Starting with this question in mind, Vittorio Loreto takes us on a journey to explore a possible mathematical scheme that explains the birth of the new. Learn more about the adjacent possible, the crossroads of what's actual, and what's possible and how studying the math that drives it could explain how we create new ideas. Well, knowing things having a good knowledge of subject matter is also very important.

So, you must devote your time to understanding what is the existing state of the art studies. And with this this course I am trying to give you this state-of-the-art knowledge pieces around these lectures, these topics. So that you feel a prepared, you are ready to hop on to your next jump.

Finally, in this last lecture in this slide from Shimpei Takahashi, play this word game to come up with the original ideas. Shimpei Takahashi always dreamed of designing toys. But when he started work as a toy developer, he found that the pressure to produce squashed his creativity. In this short, funny talk, Takahashi describes how to how he got his ideas flowing again and shares a simple word game anyone can play to generate new ideas.

So, he had this intention this interest of designing toys, to be a toys designer. But, the pressure of producing more and more and becoming part of this all of this earning game, he sometimes he

got a derailment, he experienced derailment for exploring new ideas. So that is what he has shared over here, you must not derail from your, whatever is there a pressure from professional life; or a family life or something. But, you keep devoting some time for what your inner this soul or your inner thinking desires you to do. And that will lead you to come up with some novel ideas, some new innovative thinking.

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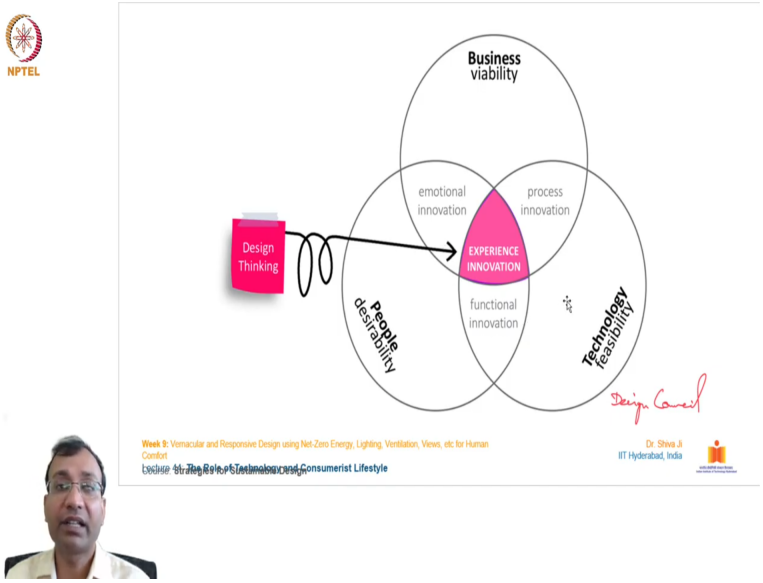

So, in a overall sense, what is this innovation thing is? So, some agencies, some researchers, designers they have given some models. Bringing innovation into a structured format, one of them is given over here. So, there are 3 circles of a business, people and technology; around which you know in its overlapping area. There is this experience of innovation one can understand; and with this what you by business they mean a viability of it. By people desirability, whether they are people are they are any need for it and our technical technology of course makes things possible, makes things feasible.

And also under the cusp of these 3, you see over here is the experience of innovation; and between these two emotional innovation, process innovation, functional innovation. So, for when the technology and people there is a direct demand and the need is related, then that is a functional innovation, where you can innovate and technology will be a service provider, technology will be a problem solver.

And here in a business that means there is some process involved, so in this process and with the help of this technology, you can improve the process. And between business viability and desirability, of course there is a factor of emotion. So, that is where this emotional innovation is mentioned. And at the cusp of all of these 3 is the total innovation or the experience of overall innovation they are talking about.

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You can understand it more detail over here, the human experience, the behavior change; so the overall experience of innovation comes at the cusp of these 3.

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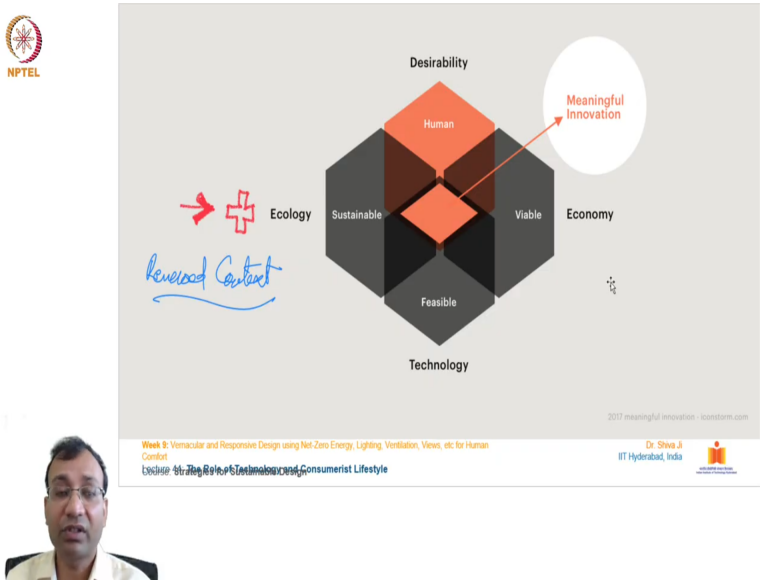

Recently, in the renewed context of this sustainability studies and this global warming and all of these new paradigm shifts which have happened or even happening, we are in the transition phase right now. So, with the influence of this, there is another addition of ecology over here in these the pre-existing these 3 domains. So, we have this approach of sustainability also introduced over here; and then at the cusp of these four now it is being also proposed, there is this some meaningful innovation should actually or can actually happen.

So, you see the importance of these sustainability and sustainability studies; and how we can strategize to deal with the circumstances deal with the changes which are happening in this entire ecosystem these days and come up with some new ideas. So, innovation is not limited to just one thing, innovation can happen anywhere and everywhere.

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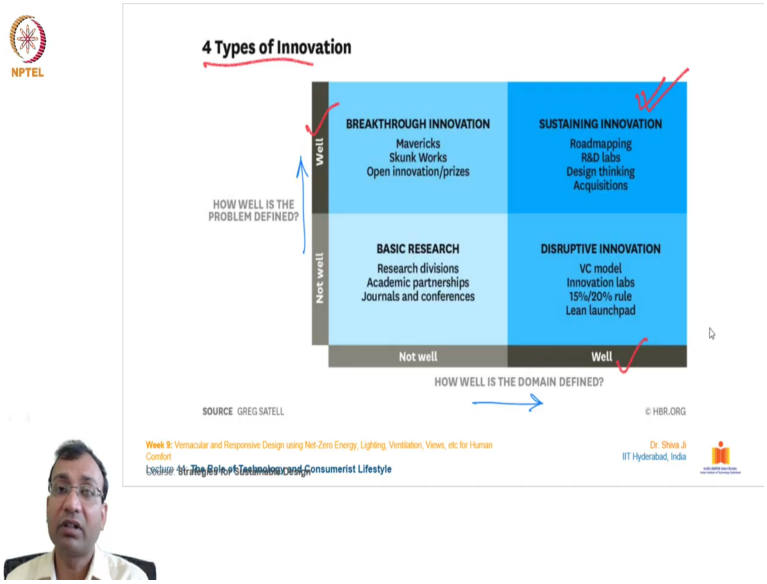

Further there are from this HBR; there are 4 types of innovations they have given; so I have listed down over here. So, on the x-axis we have how well is the domain defined? Well not well defined, properly defined. And on the y-axis, we have how well is the problem defined? So not well defined and well defined. So, in these 4 quarters, we can understand in what scenario what is the likelihood of what kind of sustainability, what type of sustainability?

So, if the problem and the domain are clearly defined, you can have a sustaining innovation model. Road mapping, R&D labs, design thinking, acquisitions. And if you have none of these 2 defined in a clear way, even the domain is not clearly defined even the problem is also not clearly defined, then that falls under the basic research, research divisions, academic partnerships, journals and conferences they fall over here.

But, this factor of this innovation, the strong innovation comes in these 3 quarters as you can see over here. If the problem is well defined and the domain is not clearly defined; you can go through for a breakthrough innovation like maverick ideas, open innovations and prices and these competitions also fall under this quarter over here.

And next if the domain is well defined, but the problem is not well defined; you end up with the disruptive innovations. So, this is where these are disruptive technologies, disruptive innovative business models or maybe a product or maybe service solutions, they come under these quarter.

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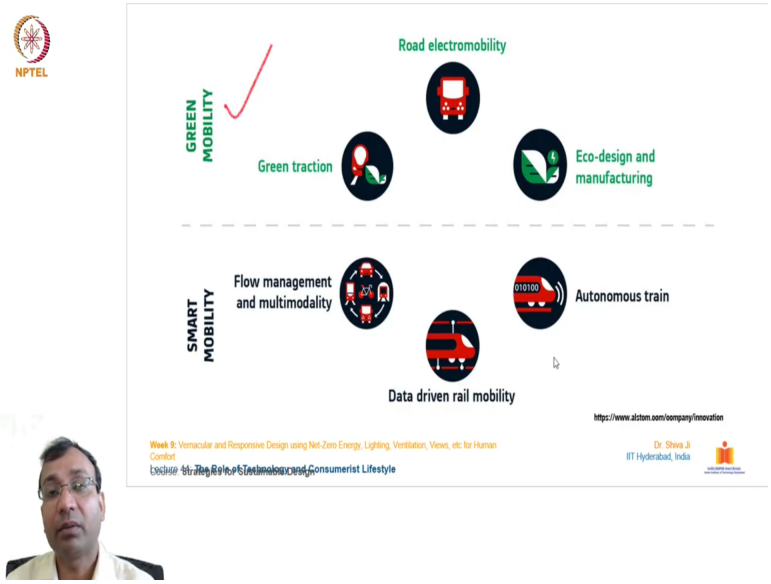

Moving on this is if you see this is taking from a company Alstom, you may be aware of this is a big, big company. So, how they have been doing this smart mobility; so flow management multimodality, data driven rail mobility, autonomous trains in autonomous mobility etcetera. So, in this one there is this factor of green and now the improved scenario involves these green factors. And with the introduction of these green perspective, it has become a green traction, road electro mobility, eco-design and manufacturing.

So, the whole approach of the business model of this company they have taken a new a path altogether; so, that is where this innovation has come up. So, this introduction of this green factor has led to innovation in all of their aspects; like how they have been conventionally dealing with their lack of product system design and process design etcetera.

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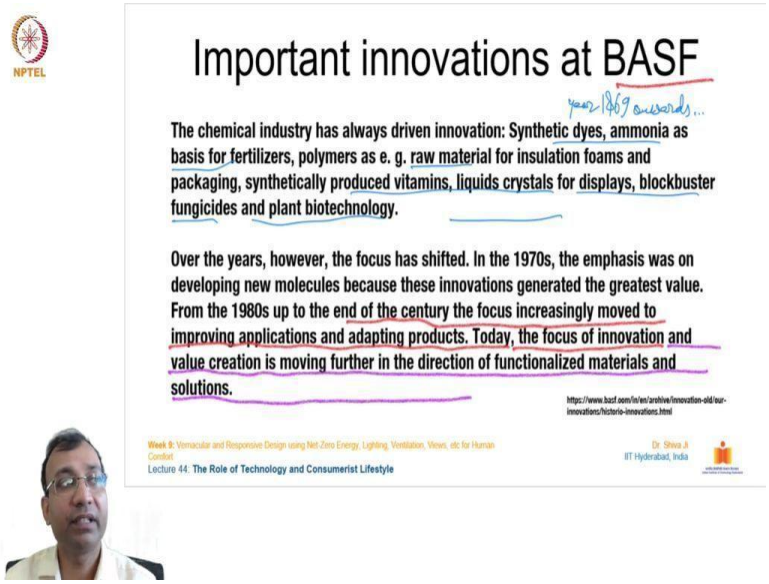

So, there are several examples one can see, another example from a very famous very big company BASF. It is a hardcore a research and innovation-based company; they have been coming up with the very innovative products for a long time. And they have given very functional and utilitarian products in the consumer to the people.

So, let see them journey they have how they have come up with some innovative products. So, the year 1869 and onwards, the chemical industry has always driven innovation: synthetic dyes, ammonia as basis for fertilizers, polymers, etcetera, raw materials for insulation foams and packaging materials, synthetically vitamins, liquid crystals for displays, blockbuster fungicides and plant biotechnology.

Over the years, however, the focus has shifted. In the 1970s, the emphasis was on developing new molecules; because these innovations generated the greatest value. From the 1980s up to the end of the century the focus increasingly moved to improving applications and adapting products. Today, the focus of innovation and value creation is moving further in the direction of functionalized materials and solutions. So, we will see some examples from this company.

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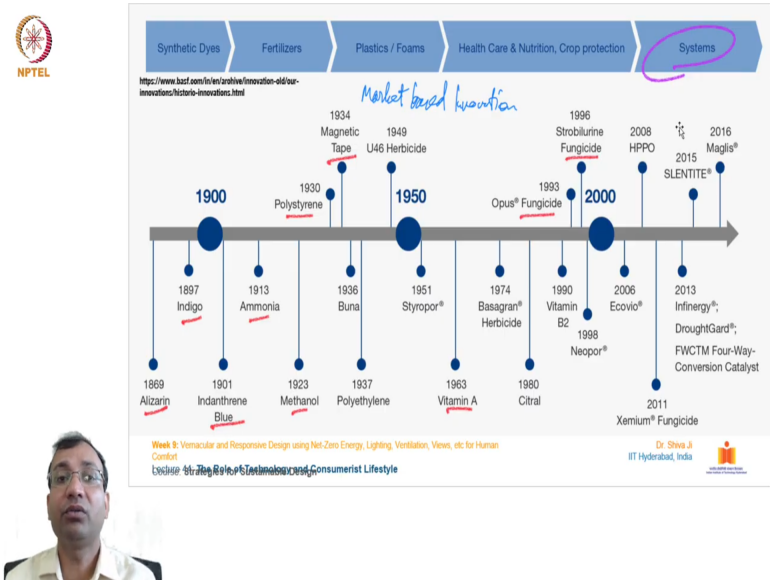

You see this table over here; this is taken from the BASF website. So, from the 1869 and onwards you see they have listed down disruptive innovative products, what this company or the materials that this company has launched in the market; and they are the materials who have facilitated several types adoptions and the products in the market in the later on. For example, if see vitamins, the fungicides, herbicides and some other chemical compounds for polymers etcetera. They have given the ammonia, even the coloring like dyeing and dyes and pigments; they have created over the time, who have facilitated.

Facilitated several types of adoptions of the, these products in the market. So, starting from alizarin, then indigo this dye was created by this company. Then another version of this color was improved version was launched later on; then ammonia, then methanol was also invented by this company. Polystyrene, magnetic tapes, and vitamin A, fungicides and several other things; you see they have listed down these are disruptive innovative products and techniques and technologies what this company has developed over the years.

So how this has changed also if you see now their focus majorly in these recent years is on changing the systems. So, this is the systems analysis, systems mapping and system intervention becomes very important. So, when we work around the systemic intervention and this is systemic studies; the chances are more that in our innovation will be applicable for a huge number of

audience, and for and for bigger context. So, this is important to go for systemic studies and analysis.

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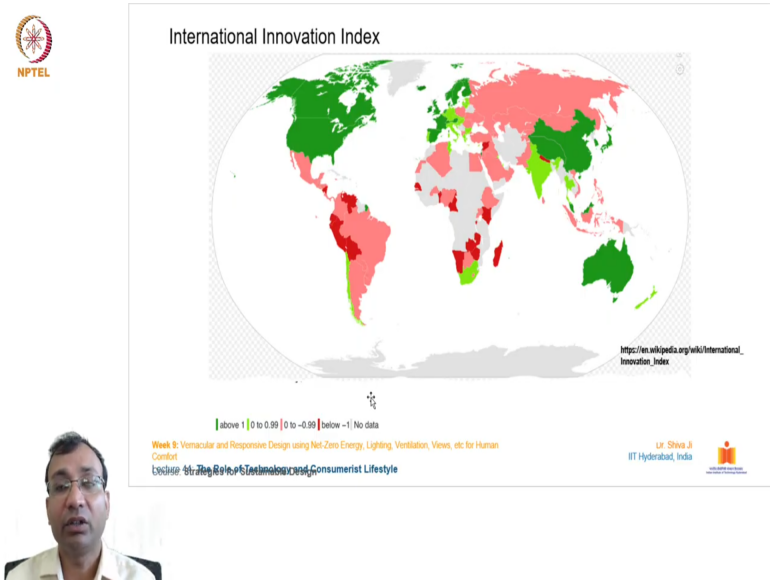

Well, comparing international innovation index if you see, so this is the data over here from 0 to 1. So, the dark green is above 1 and then this range is 0 to 0.99; then 0 to minus 0.99, and below minus 1 and no data. So, in this one if you see other countries such as US and Canada and China, Australia and United Kingdom over here, Sweden, Norway, France, Germany these countries; and are doing very good under this international innovation index.

Well India is not far behind; India is also in the second slab over here; you can see this is in the light green. But rest of the, there is a huge the list of the countries, who are still struggling for this innovative innovation in their everyday, this R&D and other growth and development activities.

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Further how to come up with these ideas, so for few next slides we will discuss about this approach. So, what is design? What is a design process? So, it is very simple; you empathize. What is empathy means? Like you if you are able to feel the experience of the person; the you are like a target audience. What he or she is going through? What kind of challenges they are facing? What are the kind of the pain points and gain points, if you are able to experience it; much more subtle way, you know that will give you insightful ideas to come up with the most suitable solutions, most suitable design solutions.

Then for after empathizing, you define the problem area defined whole scenario; then ideate conceptualize, prototype and test it. So, these are very simple 5-step process of design thinking; and this can also you can follow for an innovation. So, you must understand or you must be able to feel the scenario or the context or the person or whoever is your target audience. And then if you take up this process the, there are likelihood that you may come up with some innovative solutions.

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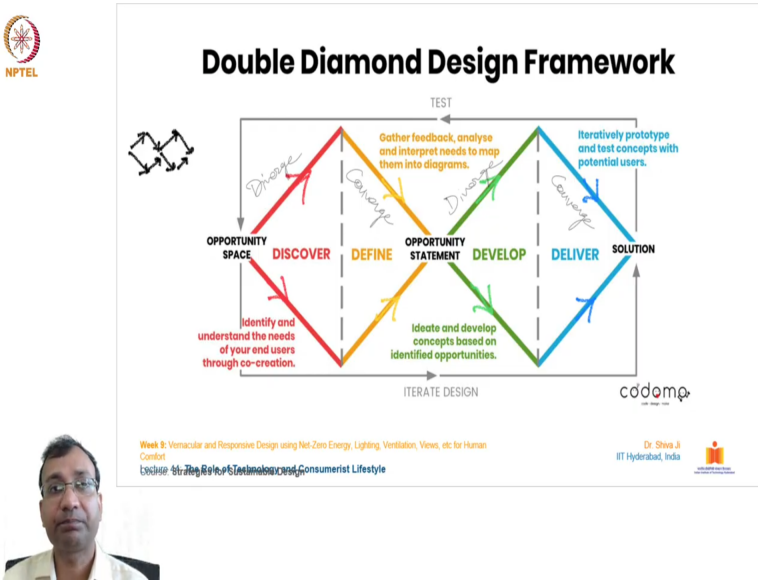

Well, there is another double diamond design framework given; this is one of the most used design processes, design methods. And so here this works with the, you first identify the opportunity area or the problem statement; and then you start discovering about it, you diverge, you try understanding, you gather knowledge around it; you gather the understanding around it. And then you start refining it again and converging; and then you come up with one very clearly defined problem statement.

And from they from here you again you start diverging to consider different conceptualizing concepts, different how to deal with this situation. And finally again you start converging to deliver the solution; so this is double diamond you see over here. This is diverging, then it is converging coming to a point, then again it is diverging becoming broader; and then again it is coming to a point. So, this is this is doubled diamond standard template for design framework.

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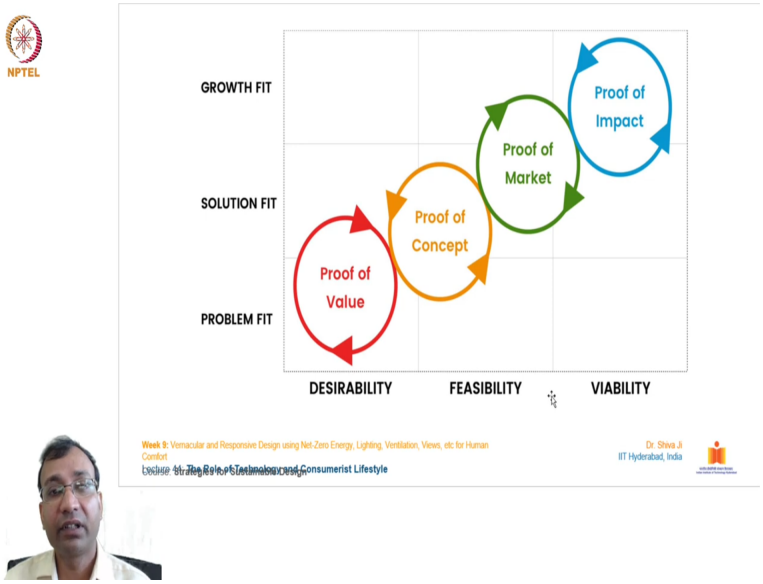

Further to test on how that desirability, feasibility and viability the 3 circles we discussed earlier in the previous slides. So, how you can make them a problem-fit, solution fit, growth fit; so you can have these combinations a proof of value, proof of concept, proof of market, proof of impact. So, here in this one you can assess how a successful your solution, how successful your idea is or the concept is; so, this is how it progresses over the time.

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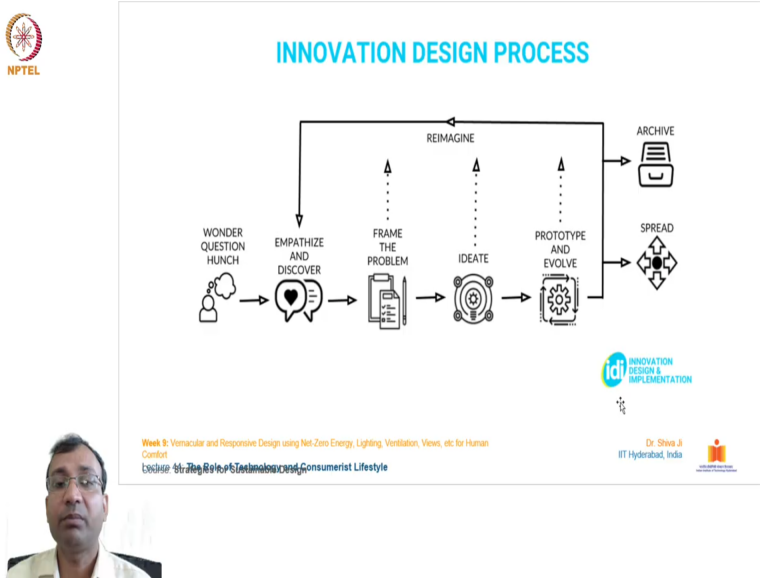

And another design innovation process is given over here. A questioning, visualizing and understanding the problem and then empathizing and discovering; again these terms are common

from the double diamond this design process what we have seen earlier. And then framing the exact problem what is it? Ideating, conceptualizing and designing, detailing; and then prototyping, testing it.

Again, you can if there is any lacuna or any a shortcoming, you can go back; and again revise your empathy studies and all that. Then again you come up with ideation and then again you give the solution, test it, if it succeeds; you go for the final spreading it out or maybe archiving or keeping it for a future use. So, this is this typical innovation design process.

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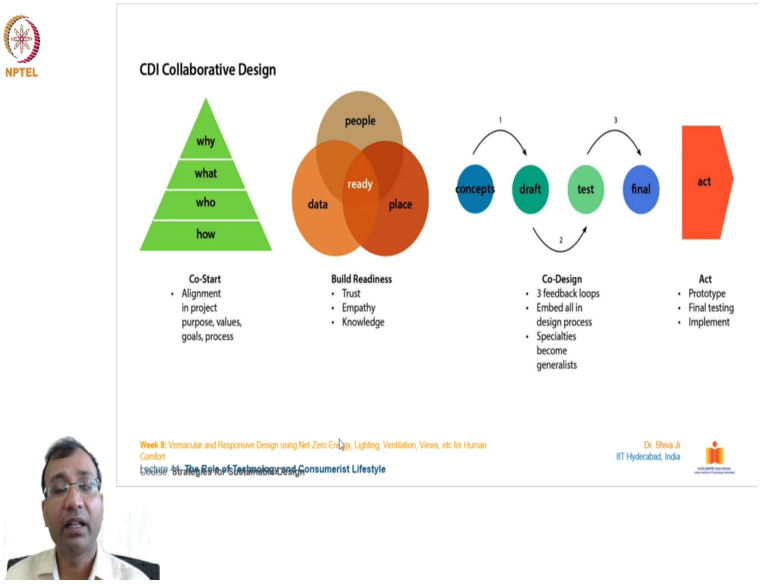

Some more processes are given over there here; how to probe deeper into queries or the scenarios. So, you see over here how, who, what, why; so these questions of interrogation must be carried out properly to investigate the subject. So, and then you make this table of we have studied this table before; how sustainability takes place in between the people, products and places. So, similarly it is given people, place and the data; so between this you can check your readiness level. And you can go for that an empathetic, empathy based understandings and insights drawing etcetera.

Further next to that again conceptualizations your drafting, testing and coming in the final; so, this is standard typical design process. And there are there are feedback loops, where the feedback loops help us to refine the, our processes, which we have already carried out. So, we can come back to those previous processes; refine the overall the project whatever we are doing.

The innovation or the design problem, what we are trying to solve; and finally acting with the help of the prototype or the final solution and final testing; and finally rolling it out or implementation stage. So, this is how a further you can have your innovation process, design innovation; a strategy this is how you can formulate.

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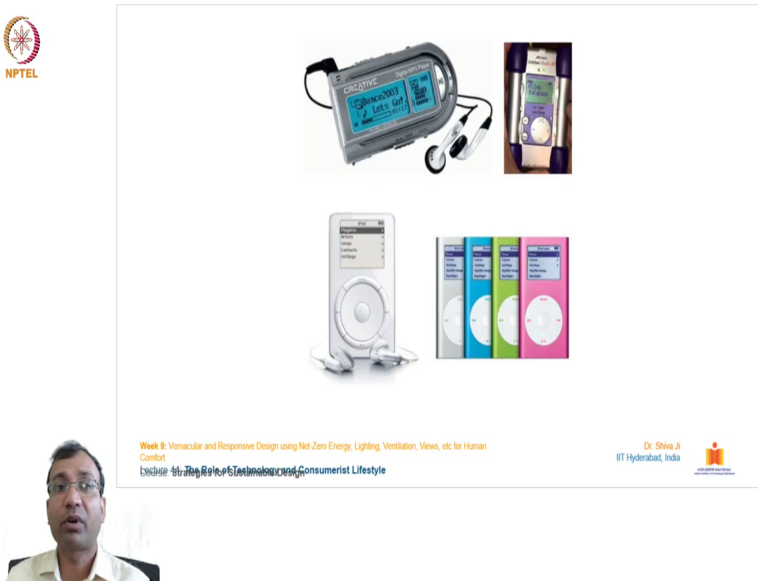

Some examples of products from around us; you may be familiar of this product. How this used to come in the earlier times before the apple made these products in a very swanky very state of the art product design solutions. So, the how these portable music players used to come in the earlier time; they used to run on mp3 or such files. And they were portable with the on-board battery and with these earplugs over here. So, this was one of the very initial product solutions of music on the go; and how it has evolved over time, so we have this solution. So, the how product innovation has taken place over the time and how the product itself has become an example of this innovation process.

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Further we have one very famous example of Coca-Cola bottles over here. So, with the innovation with this iterative design process, it has adopted a very unique this shape; and size of these bottles you this unique the form of this bottle. And if you see it started from one very conventional bottle in the first; it was when it was rolled out I think more than 100 years ago. And how it has derived itself from in the in the evolution; so you can see the evolution over here, even with the change of the materials. But, it has retained its shape and it is this purity of form in some to certain degree. So, still we can this uniqueness, the approach in this in these innovative ways over here is the identification of this product; so, that it has continued over the time.

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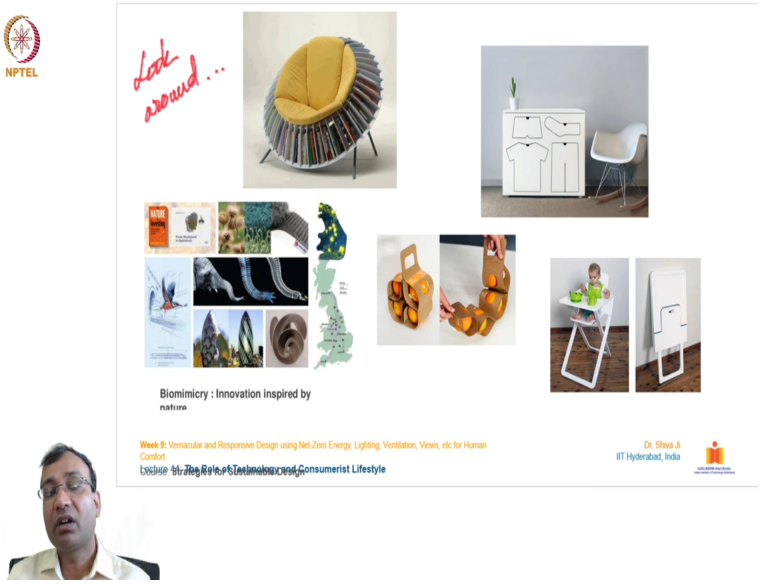

Well, you can look around and see several such examples of innovation in everyday products and utilities things. And also starting from a chair to a table, cupboard and several other even the shape of the buildings; the volume of the of the buildings; and several other mechanical solutions the packaging furniture products, lighting.

The such innovative solutions you can see around yourself and you just take any one example of your whatever is available to you. And just try decoding what are the major improvements, the innovation those are actually carried out from the conventional product to that product; and how they have driven. So, this will give you some understanding how innovation take place.

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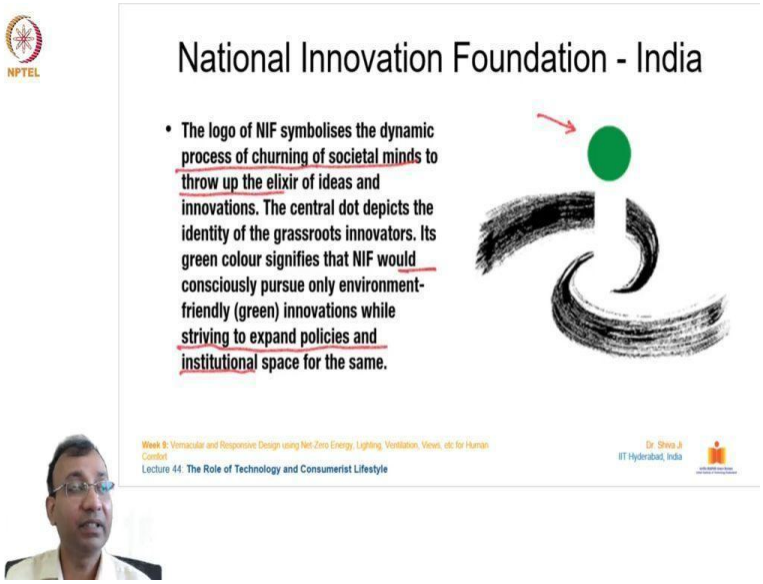

So, I am from here now onwards, I am taking you to on a very fresh very interesting journey of this innovation; like how the innovation take place and how innovation is happening in and around us. Sometimes we are aware, sometimes we are not even aware of such innovations. So, how this innovation can be nourished can be supported with the organizational support system. So, this is one of the best example of this support system; this National Innovation Foundation of India. So, this NIF was instituted was formed a few years back; and this has taken a major role, a leader's role in supporting grassroot innovations happening across India.

From any corner, from anybody, from any person whether it is a school going a children or maybe a farmer, or maybe a food grower, or maybe a labour or maybe a business entrepreneur, or maybe a shopkeeper any person. Any person can become part of this unique movement, and they can seek some support from this organization. So, starting from the logo what it symbolizes? So, the logo of NIF symbolizes the dynamic process of churning of societal minds to throw up the elixir of ideas and innovations. The central dot depicts the identity of the grassroots innovators.

Its green color signifies that NIF would consciously pursue only environment-friendly innovations; while striving to expand policies and institutional space for the same. So, how beautiful, how thoughtful is that the concern for this environmental; concerns environmental perspective is already rooted in this NIF. So, logo and it is a preamble, so how heartening it is to see this.

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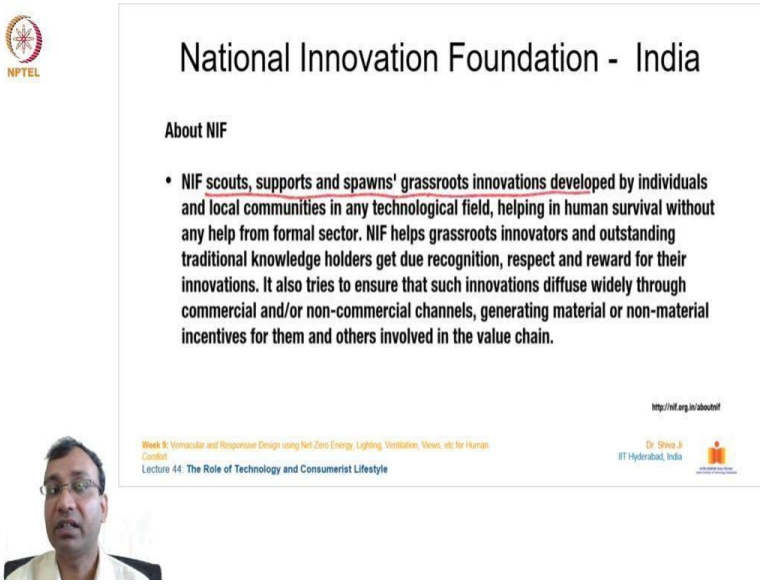

And we will see in the next slides, how they have come up with some innovative products; and how they have showcased it for; and how they have brought up further commercialization of those ideas. So, little about NIF before we move on to those slides. NIF scouts, supports and spawns grassroots innovations developed by individual and local communities in any technological field, helping in human survival without any help from formal sector.

NIF helps grassroots innovators and outstanding traditional knowledge holders get due recognition, respect and reward for their innovations. It is also tries to ensure that such innovations diffuse widely through commercial and non-commercial channels, generating material or non-material incentives for them and others involved in the value chain.

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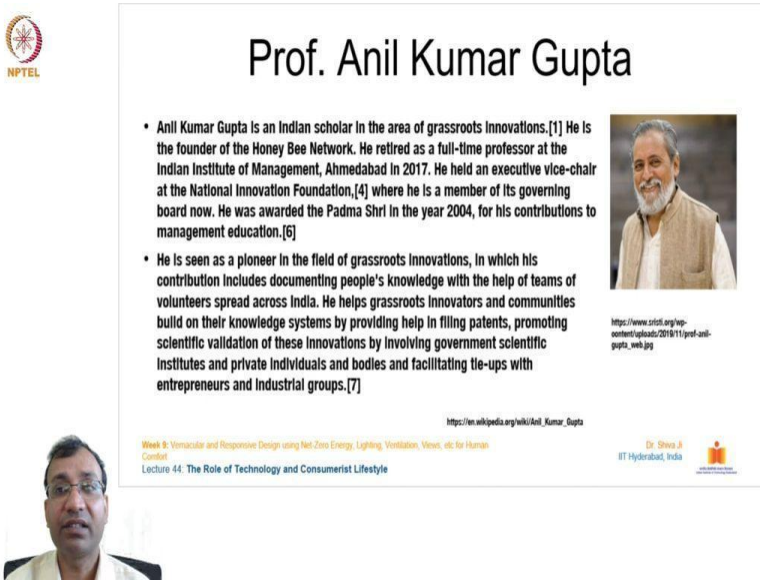

So, when we are talking about innovations, the talk is not complete unless we mention Professor Anil Kumar Gupta. He Anil Kumar Gupta is an Indian scholar in the area of grassroots innovations. He is the founder of the Honey Bee Network. He retired as a full-time professor at the Indian Institute of Management, Ahmedabad in 2017. He holds an executive vice-chair at the National Innovation Foundation, where he is a member of its governing board also. He was awarded the Padma Shri in the year 2004, for his contributions to management education.

Further he is seen as a pioneer in the field of grassroots innovations, in which his contribution includes documenting people's knowledge with the help of team of volunteers spread across India. He helps grassroots innovators and communities build on their knowledge systems by providing help in filling patents, promoting scientific validation of these innovations by involving government scientific institutes and private individuals and bodies and facilitating tie-ups with entrepreneurs and industrial groups.

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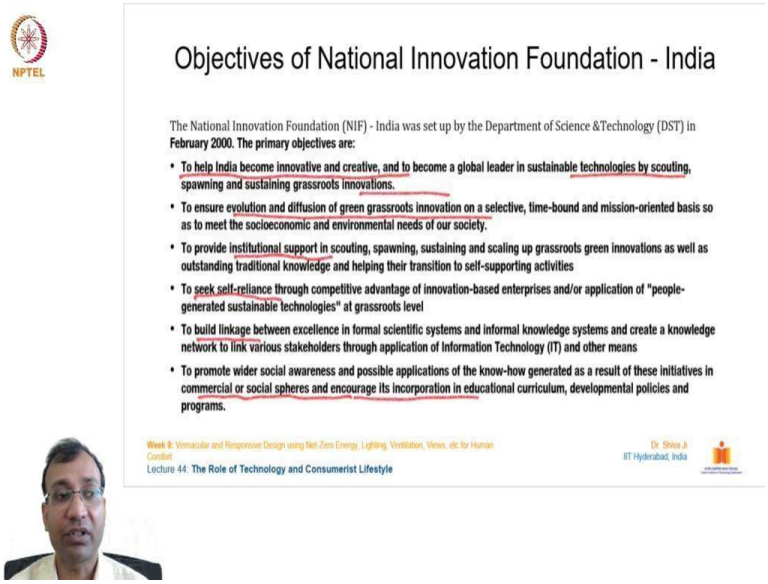

So, what are the objectives of NIF? Quickly let us have a look; so that you can also associate or approach this organization. For your innovations for taking ahead of your ideas and the, your disruptive concepts, which can be utilized, which can be useful for something somewhere. So, the NIF India was set up by the department of Science & Technology, under the ministry of Science & Technology Government of India in February year 2000. The primary objectives of NIF are: To help India become innovative and creative, and to become a global leader in sustainable technologies by scouting, spawning and sustaining grassroots innovations.

To ensure evolution and diffusion of green grassroots innovation on a selective, time-bound and mission-oriented basis; so as to meet the socioeconomic and environmental needs of our society. To provide institutional support for such activities to seek self-reliance to build linkage between the grassroots innovators and the industry, and other organization; and to provide wider social awareness and information.

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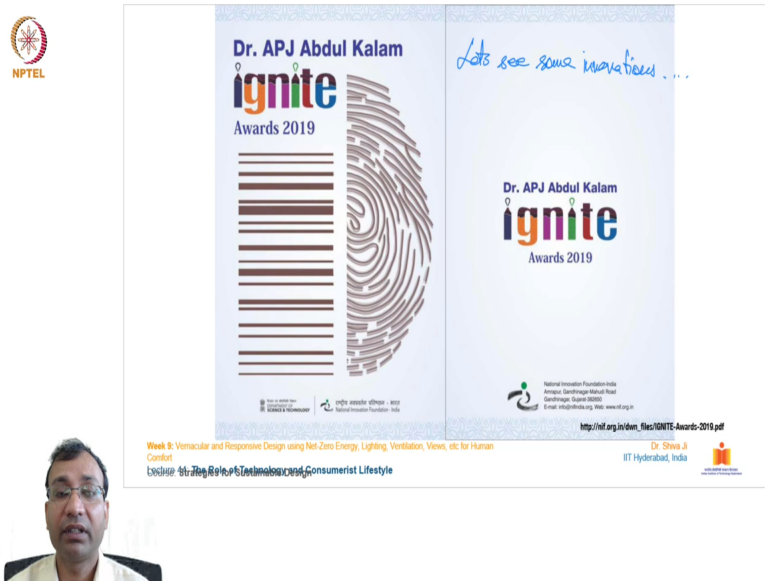

So, I have a referred some grassroots innovations from this book; you can go and refer this book. This is available free of cost for your reading on the website of NIF; in NIF the link is given on the slide.

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So, the first example from this 2009 Ignite Awards of NIF. So, she is a class 8th student over here; you see this Vinisha Umashankar. So, she is a student from this Tamil Nadu and she has designed this solar ironing cart. So, as you can see it is very clear and evident from this illustration, she has designed ironing cart, a mobile ironing cart, which has these solar

photovoltaic panel on the top to generate power for the requirement of this ironing. Usually we have seen such vans or these are such carts, which utilize either electricity for that they have to be stationed at one place and draw some power.

Or they use a majorly coal based these are heating in these their irons. So, this is one of the I think this is the winner of this challenge in the year 2019. So, it is such a simple approach; it is such ground to earth approach. Why cannot one think of this? But yes this came to mind of this girl; and see how efficiently, how amazingly she has put idea this together into workable. So, this is completely workable solution, one can build it very easily; and one can make use of this innovation.

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Further we have this second example from this Baibhav Parida; he is a student class 8th again from Odisha. And he has designed visually challenged friendly toilets like how to facilitate these toilets for the people who are visually challenged. So, a system guided by this sound, so as simple as that he has used this technique to guide these visually challenged our friends. So that they can be guided in public toilet area, just based on this system.

So, these tiles have will have some sensors to sense the movement of these people. And with the help of speakers as you can see, he has illustrated in this sketch; these people will be guided. Even the faucets and these water closet units, they will also can be connected with the using artificial intelligence, there is a network and they can help our brothers.

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So, further we have this example of expandable food plate; so this is a class 6th student. See how these children they have come up with the novel ideas; so, that is overall life point over here. Innovation is not just a quality of only the learned, and the only highly qualified. Innovation can be done from, can come from anybody, at any point of time. So, she has designed this expandable food plate, the tiffin which we these are students carry to the school. They can convert this tiffin itself as a plate, and they can use it for their having meals.

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Further, there is this insect killing dustbin from a student from Odisha; this is Tanmay Kumar Sethi class 7th student. So, usually we have seen this is a common sight in on the roadsides, wherever there is garbage collection or these dustbins, there is a lot of flies, mosquito and other kind of these insects kept lingering. So, how this can take care of these pests also? So, he has designed this product.

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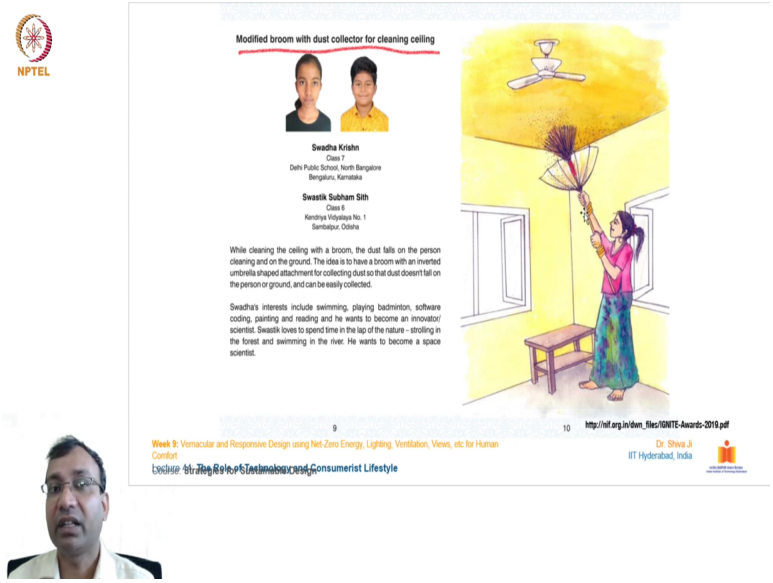

Further, we have this beautiful example a beautiful innovation from these set of these two kids; who are class from class 6th and 7th. Swadha Krishn and Swastik Shubham Sith; one is from Karnataka; another one is from Odisha. They have designed this modified broom with dust collector for cleaning ceilings; so, this is how interesting it can be without spoiling the lower floor. Or, even spilling it on ourselves; one can save using such an inverted umbrella system in the broomstick.

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So, how novel ideas, you see the further we have this easy cleaning water tank. Usually the tanks what we use? They accumulate a lot of dust and dirt at the bottom. It becomes very difficult to clean them; so why cannot we have this tapered surface at the lower areas to clean them efficiently in just one swipe only. So, this is designed by the Sidhant Kumar, class 9th student from Bihar.

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So, further we have this there is a sickle; you may have seen this sickle, sickle is a very integral instrument for any agriculturist, any farmer; who has crops to cut and take this harvest from

field. And usually they end up cutting their fingers, hands, sometimes injuring themselves very badly. So, the problem is again this agricultural field, the medical help maybe placed a few kilometers away; and this is crucial time whenever there is a any such medical emergency arises in the agricultural field.

So, why not to have a first aid kit, a lifesaving kit kept inside this sickle itself; so this is an idea novel idea from this student is Kishan Thakor; so he is from Gujarat. So, further it this idea has the potential to be developed into a full-fledged product, which will definitely help our farmers and these people who are working in the field.

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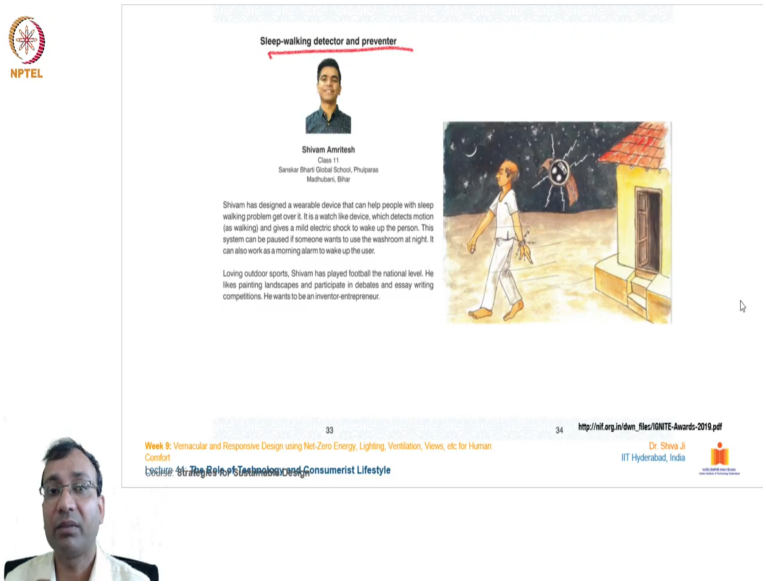

Lastly, we have this an innovative idea of sleep-walking detector and preventer; from Shivam Amritesh is from Bihar. This is a medical condition some people suffer from this condition. So, why cannot they these people be given with the such rest, which if they sleep walk in the middle of the night. So, this will give them generate some vibration, some shock; and will bring them will help them coming to their senses. And will be quite a safe saving for them, because they never know what kind of harms they may land up into while a sleepwalking.

So, see how simple but how wonderful these ideas are; so that is the whole intention over here. Innovation is not limited to anybody, any one person or anyone contacts; it is spontaneous phenomena which can happen, which can occur anywhere. So, keep thinking, keep enjoying; so with this we have come to the end of today's this lecture of innovations. Thank you everyone.