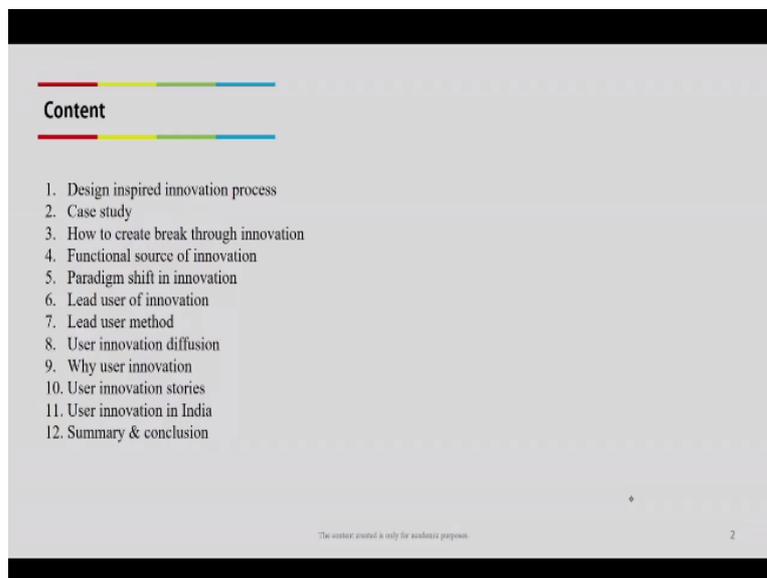


Product Design and Innovation
Mr. Supradip Das
Department of Design
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Lecture - 02
Design Inspired Innovation and User Innovation

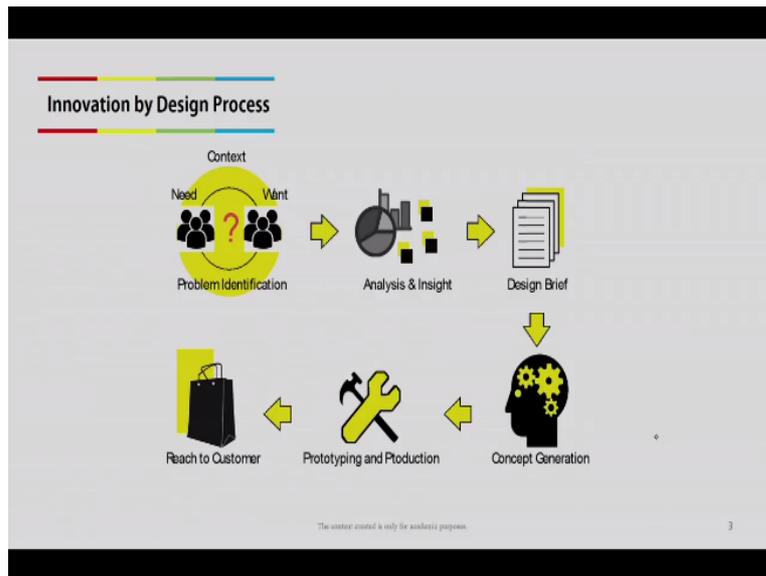
Hello participants. In the previous lecture, we have discussed about what is innovation and different aspects of innovation. Here in this module 1, lecture 2 will be discussing about design inspired innovation and user innovation.

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In this lecture, we will be discussing design inspired innovation process followed by a case study, how to create breakthrough innovation, functional source of innovation, paradigm shift in innovation, lead user of innovation, lead user method, user innovation diffusion, why user innovation, user innovation stories, user innovation in India and summary and conclusion.

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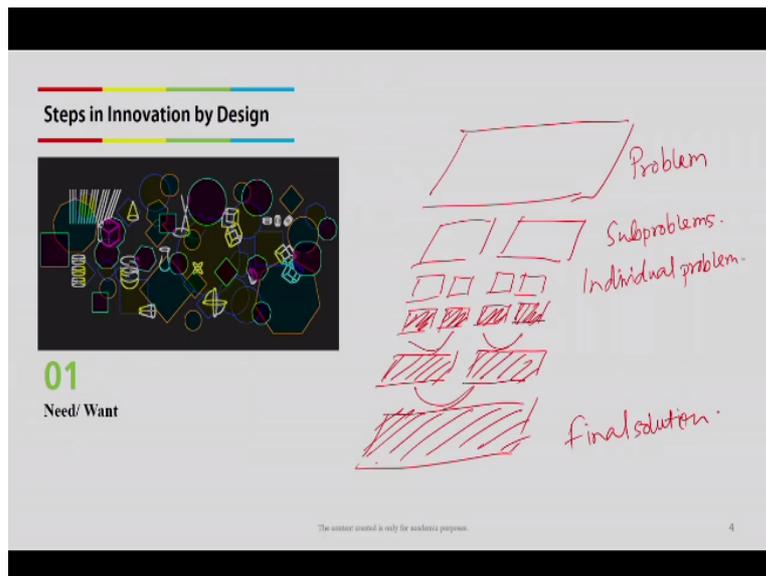
Now let us discuss about the innovation by design process. Innovation by design process starts with problem identification, using different method problem has to be identified. Then, it goes to analysis and insight phase where the nature of the problem has to be analyzed. We have to identify why is it happening; the root cause of the problem, where is it happening; the context and when it is happening; the time. By doing that we understand the scenario.

We also have to break the bigger problem into smaller units. Then, we will have preliminary design brief, preliminary design brief is vague not enough to concept generation and it does not have any clue of the user needs, so a systematic and thorough analysis of user need is required. In module 2, we will be discussing about the user need identification method and how to make a final design in brief.

In module 2, will also discuss about contextual inquiry. After this thorough analysis of the user need and want, we will have final design brief. This final design brief is full of user information and intended product information. This is helpful for concept generation. From the concept generation phase, it goes to prototyping phase where we manifest the product we wanted.

Prototyping is an iterative process and at the end the final product form and function is finalized. Then, it goes to production and finally it reaches to the customer.

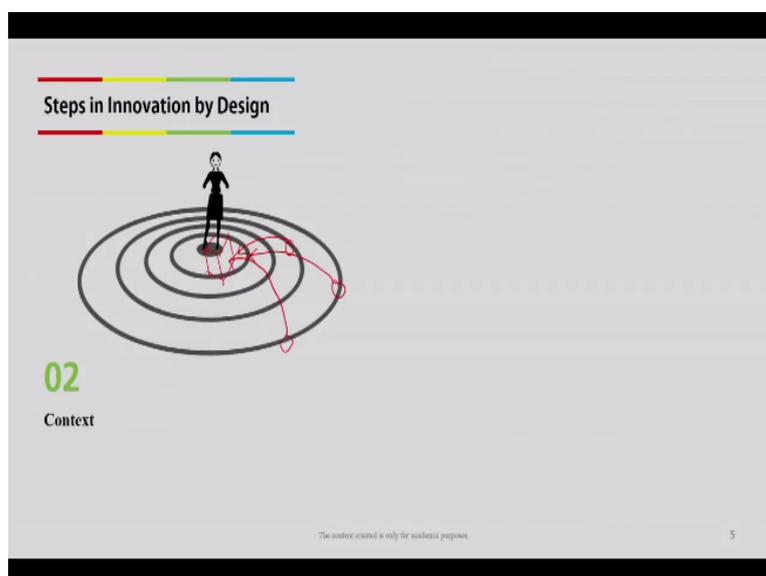
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Now let us discuss each step in brief. The first step is need identification. Innovation process starts with need identification or problem identification. It may start with felt need, anticipatory need, want or a problem. Hence, identification of need or want or problem is very important. This need or problem can be identified either by a product, manufacturer, marketer, user or even a product designer.

So in this phase, we have to breakdown a bigger problem into sub problems and the sub problems into individual problems. So now this individual problems are smaller and easy to solve. So then we will have individual solution. So then we will club individual solutions to get sub solutions and we will club sub solutions to get the final solution. So that is how it is very easy if you breakdown a bigger problem into smaller problems.

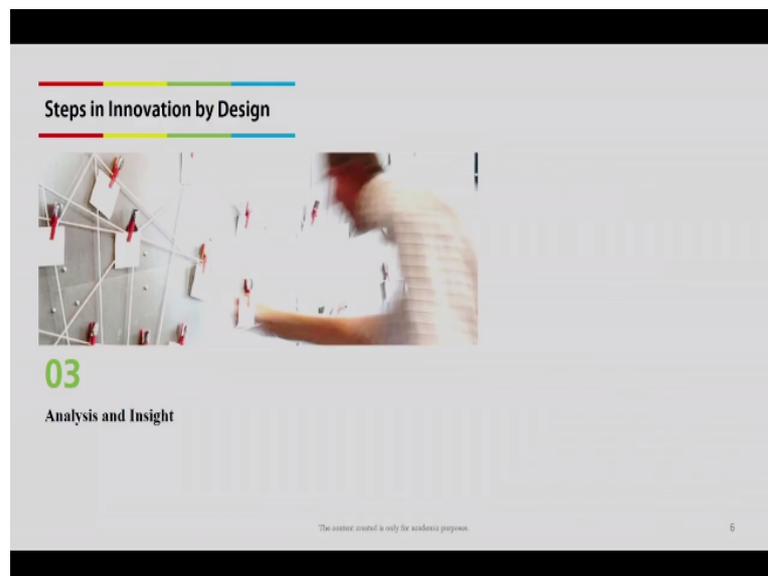
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The understanding of the context of use the product scenario, its users and user experience is very important. It is also important to study the existing products in the market. Data collected in this case are useful for systematic design inspired innovation and generally done through contextual inquiry, market study and product deconstruction. So here it is very important to check in what condition the product is used by a user.

There may be other products around it which will influence the way the product is used, so hence contextual inquiry is very important.

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The data gathered through different methods are analyzed to understand the underlying cause. The insights are the basis for the design inspired innovation. So in this third phase analysis and insight generation will be done and these insights will guide you through the design process.

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Steps in Innovation by Design

What *is the problem?*
→ would be the probable solution.

Who *will be using it?*

When *the product will be used?*

Where *the product will be manufactured?*

How *user would be using the product?*

04
Design Brief

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The next step is design brief. The insights from the analysis are used to generate a design brief. Design brief is outline of the deliverables and scope of the project including user profile, product specification including form, function, aesthetic, manufacturing process, timing and budget.

This design brief also gives us the answers from the questions what is the problem, what would be the probable solution, who will be using it, when the product will be used, where the product will be used, how the product will be manufactured and also how user would be using the product. So these are the informations we will get in design brief.

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Steps in Innovation by Design



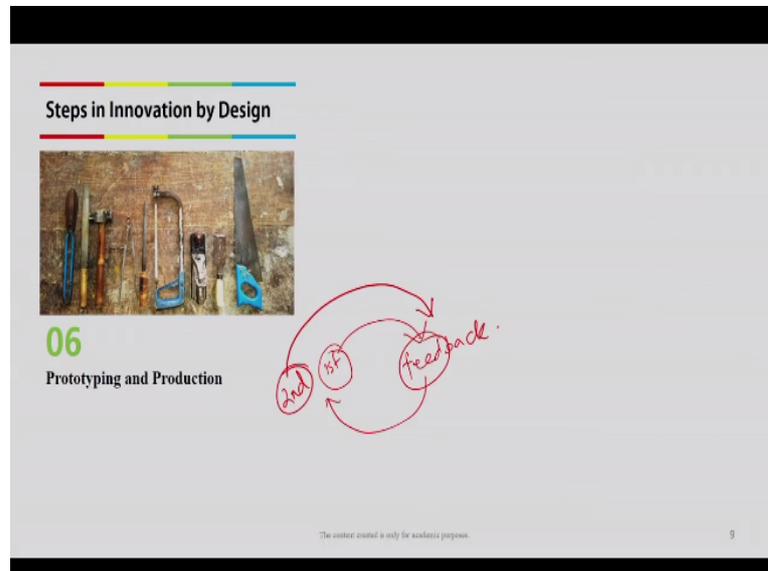
05
Concept Generation

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So next step is concept generation. During concept generation, a designer generates concepts using different tools then a final concept is selected using concept selection matrix. We have a separate lecture on concept generation method and tools.

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The next phase is prototyping and production. The final concept is further modified according to material and manufacturing limitations. A designer then makes CAD models, mockup models, functional prototypes to get feedback from the user based on which further modification is done. After selecting the final prototype, the design goes for production. So here the process is very iterative.

So first prototype you will make, you will go to the user, user will give you feedback. Based on this feedback, you have to modify the prototype that you will make the second prototype. So that is how the cycle will go on. When you are finalized with the prototype, you will go for production.

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The last but not the least step is reach to customer. The last but most important step is to connect with the customer. Sales is the emotional connect between product and the customer. Hence, sales appeal is very important.

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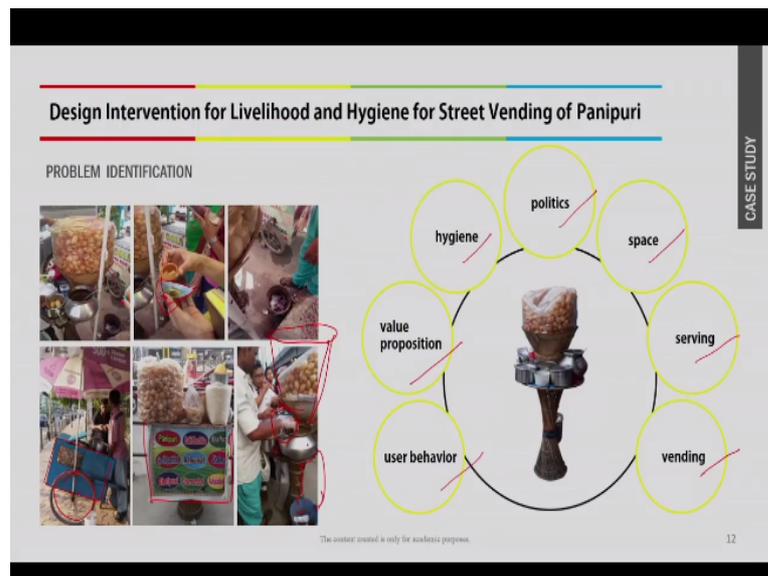
So let us see through a case study how we have done innovation by design. So this particular project is very interesting because street food significantly represents the rich tapestry of India's multicultural fabric. The popularity of street food is mainly because of the unique taste, display and experience associated with it. A large section of urban poor depends on street food for their livelihood.

Various complex issues are linked with the street food vending system, legal, administrative, hygiene, space, vulnerability of the vendors, livelihood, Indian food habit, daily life of the

urban poor, Indian traditional food, culture, values, competition from other food providers etc. So therefore an innovation by design approach was needed to improve the livelihood of the urban poor. So that was the background and then we have studied the user.

We tried to figure out what is the actual problem. We went to the actual scenario and we have done focused group technique and through interview we have figured out different issues related to street food vending.

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We found problem related to vending, so the street food vendor is carrying more than 40 kilo from his house to the point of sale which is not good for his health. We found serving related issues. Currently, they are serving with paper made bowls which is a reused paper where inks are there on its surface which is not good for our health. There we have found space related issues to sell in a place you have to give some token amount to be a part of the community.

There are issues related to politics, so where this wheel carts are selling there the stand cart cannot sell their panipuri. We found problem related to hygiene. Sometimes they are wearing gloves, sometimes they are not wearing. We have found value proposition problem. There are 10 different panipuri vendor but you are confused where to go because they do not have unique selling property.

There are other user behaviour also, we observed like the way they sell, the way they display and there are different kind of other displays. There are display of cloth, sometimes they use red color cloth around their cart so many things.

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The slide is titled "Design Intervention for Livelihood and Hygiene for Street Vending of Panipuri" and is labeled "CASE STUDY" on the right. Under the heading "PROBLEM IDENTIFICATION", there are three small photographs on the left showing the process of making panipuri. On the right, a central image of a panipuri stand is circled in black. Two yellow circles are placed below the stand, one labeled "serving" and one labeled "vending", with red lines pointing towards the stand. At the bottom, there is a small disclaimer: "The content created is only for academic purposes." and the slide number "13".

And then we narrowed down to only two problem, vending and serving related issues because of the innovation cycle constraint.

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The slide is titled "Design Intervention for Livelihood and Hygiene for Street Vending of Panipuri" and is labeled "CASE STUDY" on the right. Under the heading "USER STUDY", there are four photographs on the left showing different types of panipuri carts: a stand, a two-wheeler push cart, a four-wheeler wooden cart, and a four-wheeler metal cart. On the right, a central image of a panipuri stand is circled in black. A yellow circle is placed below the stand, labeled "vending", with a red line pointing towards the stand. At the bottom, there is a small disclaimer: "The content created is only for academic purposes." and the slide number "14".

So now we have problem related to vending. So we went to the actual scenario, again studied the user, how they are using, different kind of carts we found. There are 4 different kinds of carts available, there is tent cart, there are two-wheeler push or pull cart, there are four-wheeler wooden cart, there are four-wheeler metal cart.

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Design Intervention for Livelihood and Hygiene for Street Vending of Panipuri

USER STUDY

Home

Story

Pain points

Physiological issues

Point of sale

vending

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We also checked the journey of the vendor from their home to the point of sale, how they are carrying the materials from their home to point of sale. We heard about their stories, we figured out different pinpoints and different kind of physiological issues.

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Design Intervention for Livelihood and Hygiene for Street Vending of Panipuri

DESIGN BRIEF

Target consumer: Panipuri Vendor

Problem Statement: Because of the cost effectiveness stand carts are most popular among Panipuri vendors across India. But, long span of load creates physiological issues on various body parts. A cart is required which can address physiological issues in Panipuri vending.

Design Statement: Design and develop a stand cart for Panipuri vending, which would not cause physiological issues.

Constraints: 1. Cost should not exceed Rs. 1000/-
2. Less weight
3. Easy to lift and carry
4. Material & Manufacturing process should not effect cost

vending

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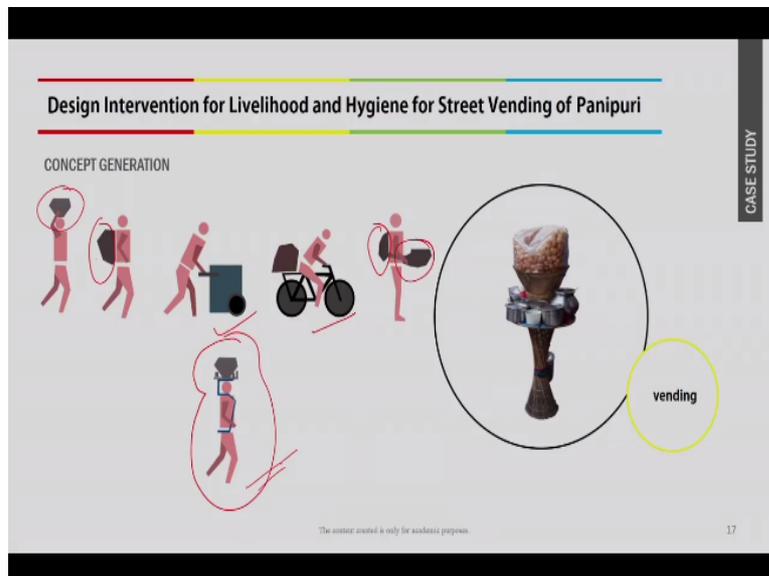
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Then, we have generated design brief and the design brief our target customer is panipuri vendor. The problem statement was because of the cost effectiveness stand carts are most popular among panipuri vendors across India but long span of load creates physiological issues on various body parts. A cart is required which can address physiological issues in panipuri vending.

The design statement was design and develop a stand cart for panipuri vending which would not cause physiological issues. We also figured out some constraints, so cost should not

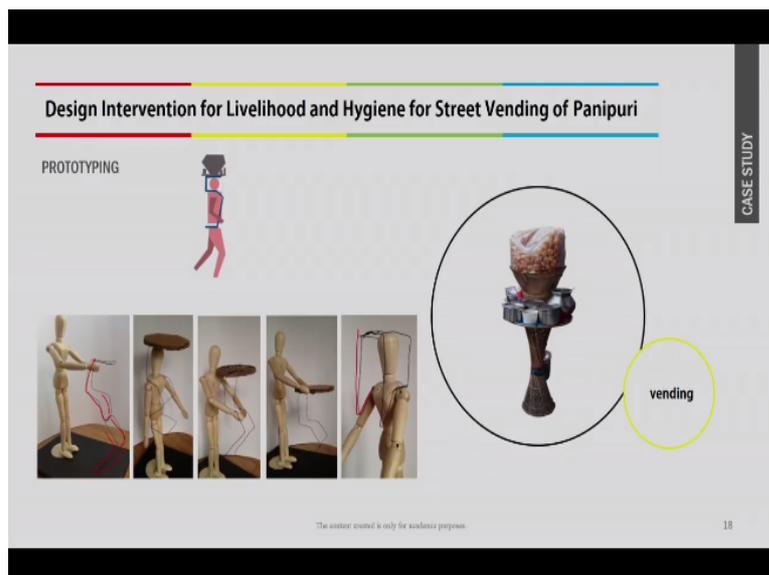
exceed rupees 1000, it should be less weight, easy to lift and carry, material and manufacturing process should not affect the cost.

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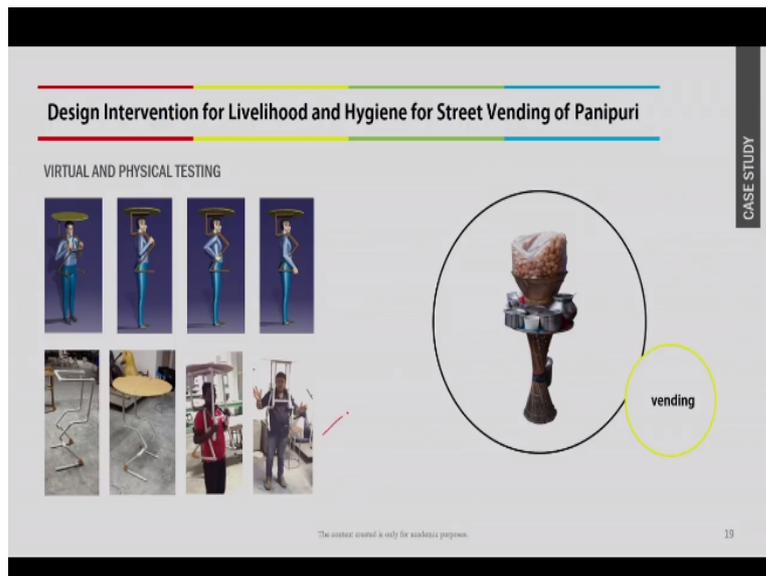
With this design brief, we moved ahead for concept generation. We checked different possible positions to carry loads. Currently, they are carrying loads on their head. So we also explored can they carry on a backpack, can they carry in a different kind of push cart or with a cycle, can we divide load into various positions may be on back and some part on the front and we also checked how we can modify the existing cart in such a way that the load is not directly coming on the head and finally we have selected this particular concept.

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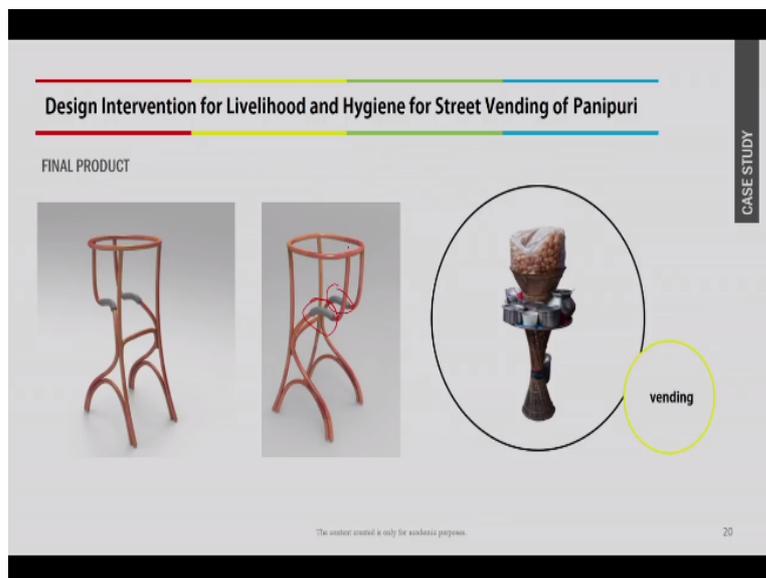
Then, we moved ahead for prototyping. In the prototyping phase, we made different kind of wireframe models to check the proportion to the body and how they will carry.

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We also checked different kind of forms and then the final one we have selected and we made a digital model. We also checked the comfort in digital human modeling software. We also made a prototype and tested with the user.

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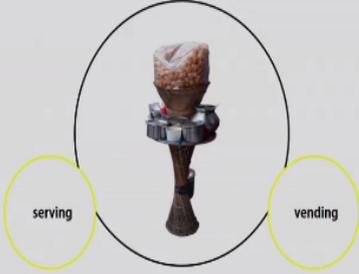


And this is the final product where cushioning material will be used where the cart is coming in the contact with the body and here the load is not directly coming on head.

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Design Intervention for Livelihood and Hygiene for Street Vending of Panipuri

PROBLEM IDENTIFICATION

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CASE STUDY

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We had two problems, one is vending and serving. So then we moved ahead for serving issues.

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Design Intervention for Livelihood and Hygiene for Street Vending of Panipuri

EXISTING PRODUCT STUDY

	Material	Good for health	Generate waste?	Biodegradable	Recycle?	Cost	How to make it?
	Paper with Aluminium foil	Yes	Yes	Partly Yes	No	Compare to Magazine paper high	Buy
	Polystyrene foam (thermocold)	No	Yes	No	No	Compare to Magazine paper high	Buy
	Leaf	Yes	Yes	Yes	No	Compare to Magazine paper high	Buy
	PVC	No	Yes	No	No	Compare to Magazine paper high	Buy
	Clay	Yes	Yes	No	No	Compare to Magazine paper high	Buy
	Magazine paper	No	Yes	Yes	No	The cheapest	Make
	Wafer	Yes	No	NA	NA	Compare to Magazine paper high	Buy



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CASE STUDY

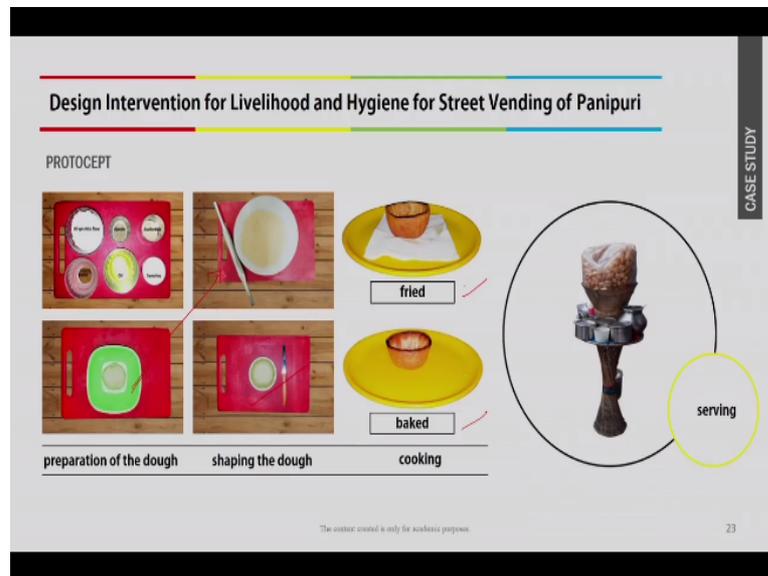
22

For that we studied different kind of products available in the market. We checked different kind of bowls available made up of paper, aluminium foil, polystyrene foam, leaf, PVC, clay, wafer and magazine paper and comparative analysis had been done. We checked whether it is good for health, whether it generates waste, whether it is biodegradable, whether it is recyclable or and also we checked the cost and how to make it.

We found that compared to magazine paper, the other ones are better but the cost is not effective and it will generate lot of waste only in this particular wafer bowl is eatable but

while consuming panipuri the water will come in contact with the wafer and the experience of eating panipuri will not be good in wafer.

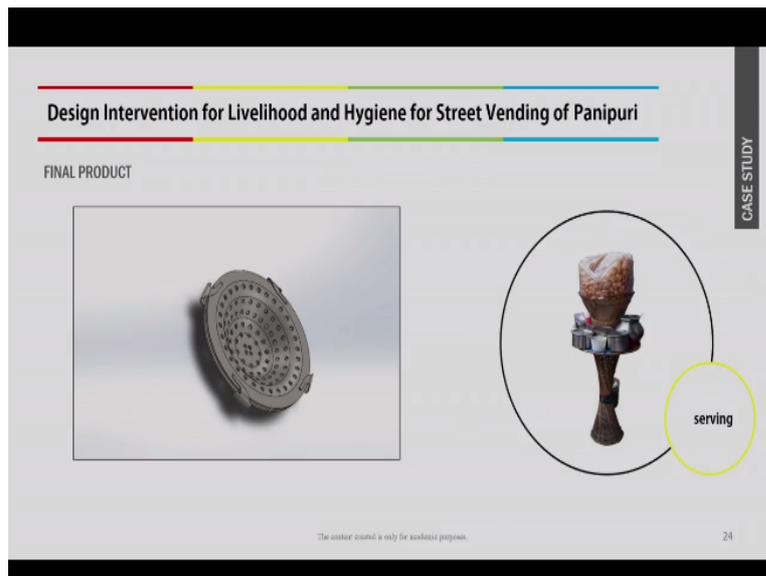
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And hence we made a protocept. You may think that we heard about concept but we did not heart about protocept. Then what is protocept? Protocept is the product developed in the laboratory to meet the promises of the product concept. We used edible materials, attas, asafoetida, semolina, oil, ajwain and water and we made a hard dough and from this hard dough we made we rolled it and we gave a shape of a bowl and we made two protocept, one is fried, another one is baked.

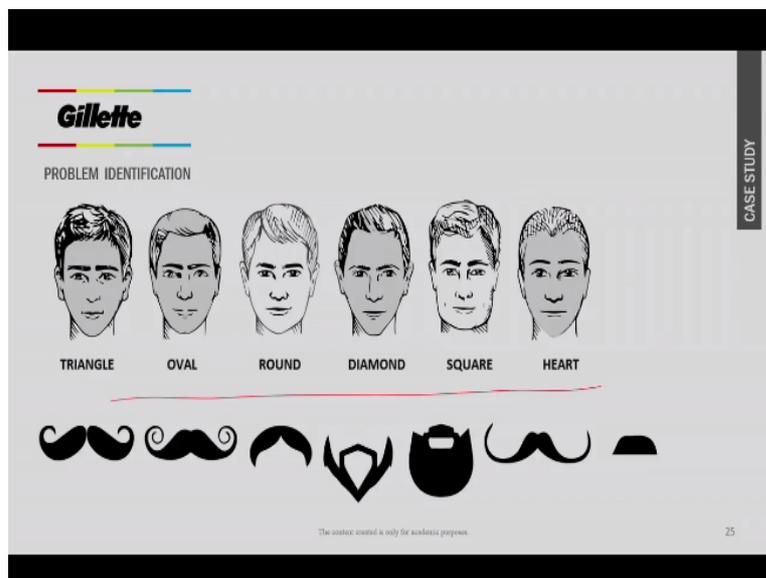
We checked the experience of having panipuri on these two. We found that the fried one is crispy enough and it is the experience of consuming panipuri is very good but in the case of baked bowl, the bowl is very hard and it is not easy to eat. So we moved ahead with the fried one but generating concept is not enough. We also looked for process innovation.

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Then, we checked how to make this kind of bowls, quick and fast. Then, for mass manufacturing we also need a mold for it where two perforated bowls will be there, one on top and one on bottom and these two bowls will be clamped with the clips and then this assembly will go on the oil to fry.

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Now we will discuss another case study from Gillette. We will see how companies are doing innovation. So in Indian scenario, there are different kind of mustache, there are different kind of beards and different kind of face patterns and in this scenario it is very difficult to develop a grooming kit.

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Gillette

PROBLEM IDENTIFICATION

Barber

Personalised grooming kit
In 80s and early 90s

Problems

1. No safety (frequent cuts)
2. Complexity in the existing razors
3. Time consuming
4. Electric razors were not affordable
5. Razor burn
6. Bumps

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In 80s and 90s, we had in the name of grooming kit this kind of razor, blades and scissor or we have to go to barber and for this grooming kit we had problems like no safety, complexity in the existing razor, time consuming, electric razors were not affordable, there were issues with razor burn, issues with bumps as well.

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Gillette

USER STUDY

Observing

Listening

Living with people

Distinct personality

Diverse preferences

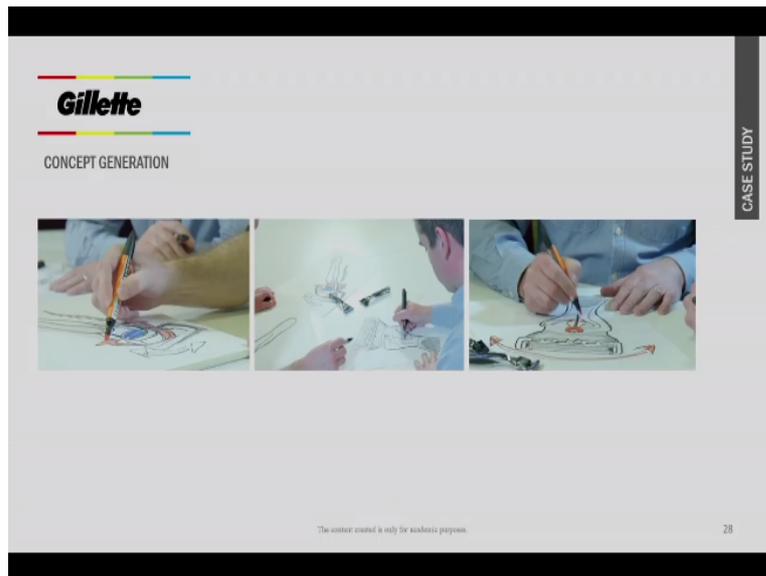
Understanding of user behavior

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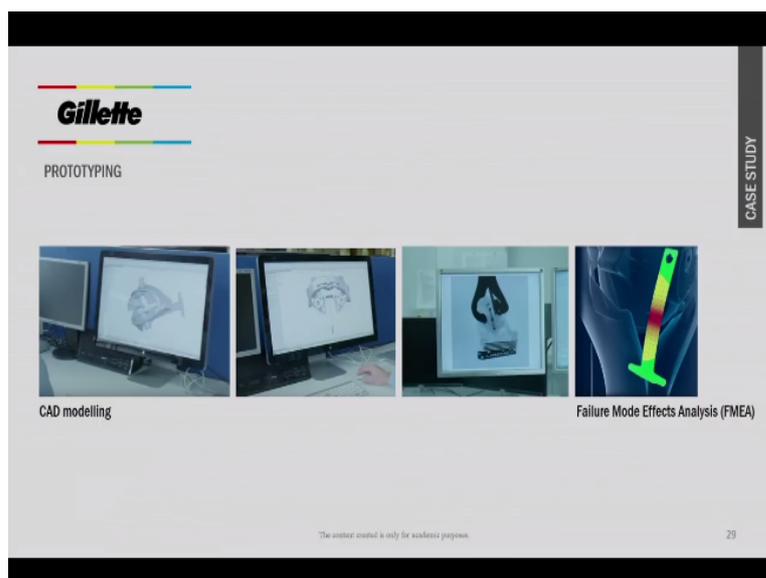
With this problem they studied the user, they observed, they had their stories, they lived with the people, they checked different kind of face pattern and also they observed how they shape. So in Indian scenario where the personalities are distinct, preferences are diverse, it is very difficult to make a grooming kit which will fit to the common mass. So understanding of the user behaviour was very important and they did it.

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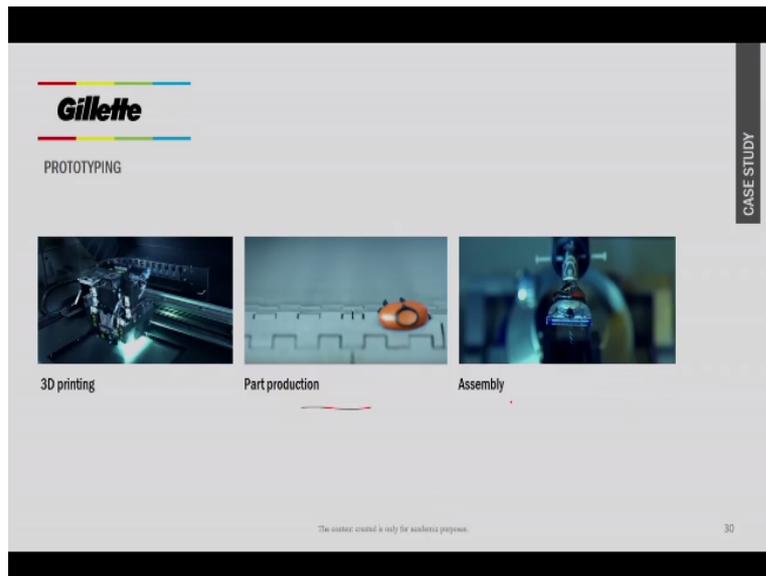
Then, they generated different kind of concept, from this concept generation they moved ahead to prototyping phase.

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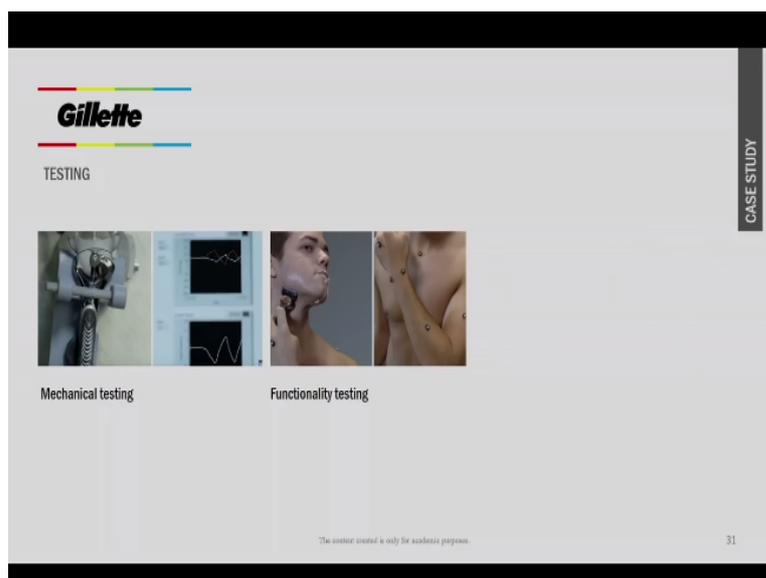
In prototyping phase, they made CAD models, they checked the failure mode effect analysis.

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And then they went for 3D printing, they did the part production and they assembled the product.

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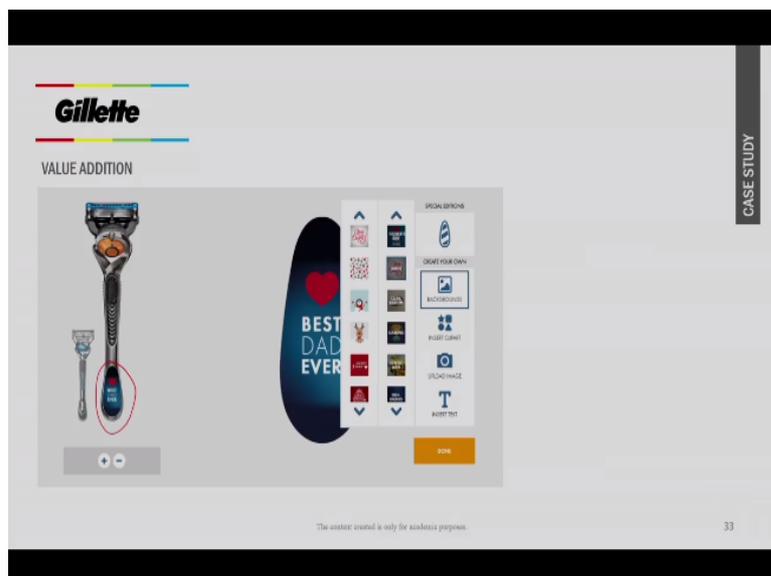


Then, they tested the mechanical behaviour of it and they also checked the functionality testing.

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The last part what they did is the packaging and marketing.
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They also added some value to the product. They kept some space where you can put some text or image. You can basically personalize the product. So by adding this feature, they are adding value.
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How to create Break Through Innovation

- Break through innovative products are integration of style and technology.
- Break through innovative products are "Moving to the Upper Right."

Great Products are value-driven and found in the Upper Right

FORM AND FUNCTION MUST FULFIL FANTASY

Positioning Map of Style versus Technology

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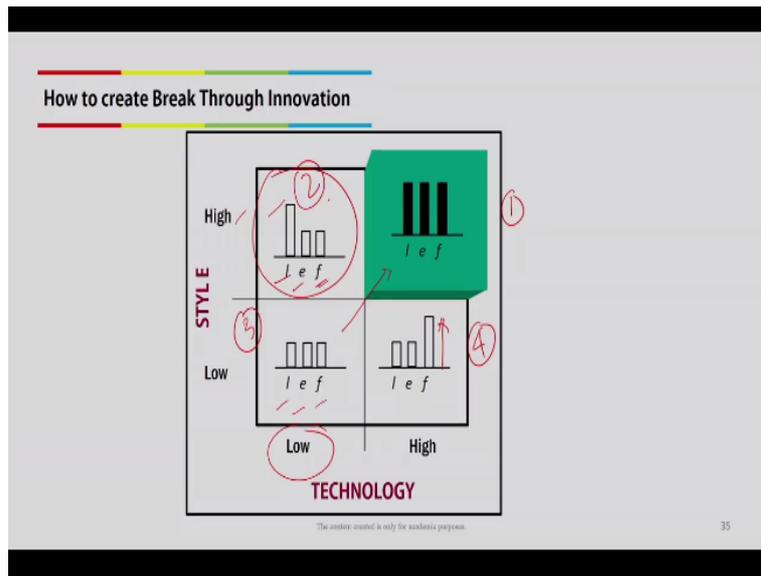
34

So now we will discuss how to create breakthrough innovation. Breakthrough innovative products are integration of style and technology. What is style? Style refers to the sensory elements that communicate the desired aesthetic and human factors of the product or service. So style is aestheticist and human factor and technology refers to the core function that drives the product in the introduction of the components that are required to use the product and the methods and material used to produce the product.

The core functionality can be mechanical, can be electrical, can be electromechanical, can be electronics, it will be analogue or digital. So people use products to improve their experience while doing tasks. Hence, the product must have features and forms that consumers quickly recognize as useful, usable and desirable. What is useful? For example, you have one nail and you have to put it on the wall and you have a stone.

So with the use of the stone, you can put this nail on the wall. So the stone is very useful but whether this stone is usable or not it is a question. It is usable if it is consistent throughout its life and also if it is easy to operate then it is usable. What is desirable? A desirable product is one whose technology, function, appearance and market positioning make us towards want to own it, so good products are value-driven and found in the upper right. And these products are such that they have form and function and fulfilling the fantasy.

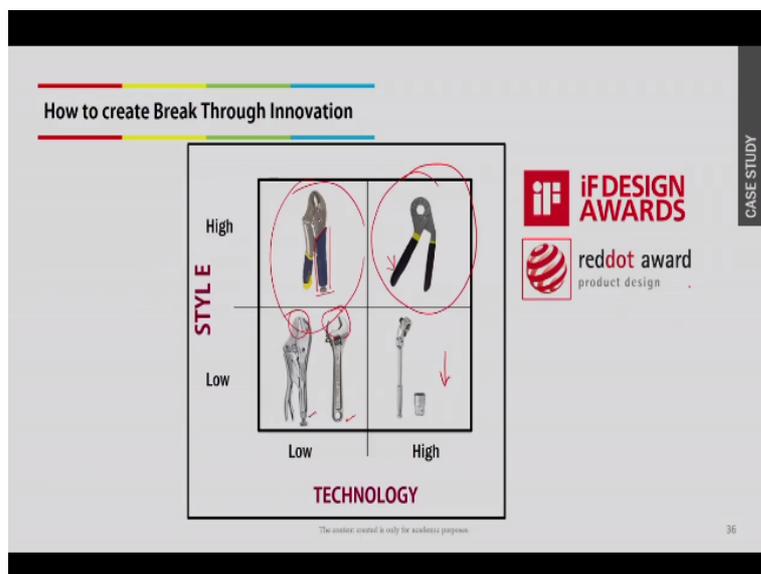
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For example, if we see this is first quadrant, this is second quadrant, this is third quadrant and fourth quadrant. So in the second quadrant style is very high and here technology is very low. So in this particular quadrant, l is for lifestyle impact, e for ergonomics and f for functional features. So in this quadrant the lifestyle impact is very high, ergonomics and functional features are low.

In the third quadrant, lifestyle impact, ergonomics and functional features are very low. In the fourth quadrant, lifestyle impact is low, ergonomics is also low but functional features are very high. From all these quadrants, we have to move to the first quadrant where lifestyle impact should be high, ergonomic should be high, functional feature should be high and it should be value-driven.

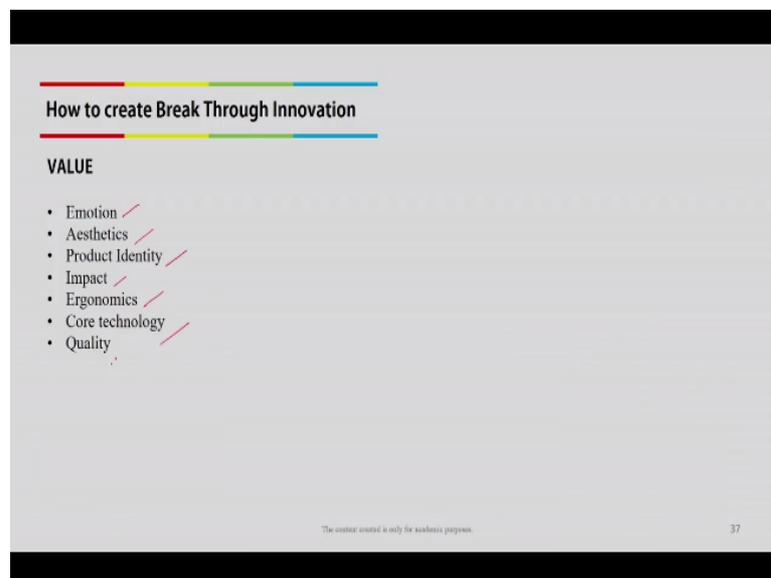
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Let us see one case study. We had spanners, different kind of spanners in market. We had this locking plier where style is low and technology is also low and also this adjustable spanner where you have to adjust all the time and the gripping is also not that good. From this point, some manufacturer headed some ergonomic value to it, style to it and we have this product. In this quadrant, we have gear range where the mechanical advantage is very good.

But the lifestyle impact in this is very poor whereas we have a good product like this bionic wrench. In this, lifestyle impact is very good, ergonomic values are high, functional features are high where you do not have to adjust anything, by default it adjusts. The grips are good because of that it won two prestigious product design award, one is iF Design Award and Red Dot Design Award.

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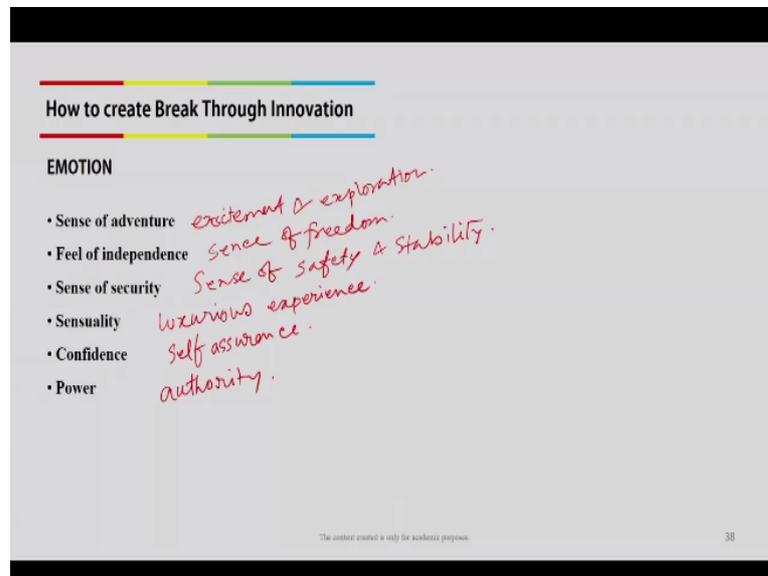


So as I told breakthrough products should be value-driven and it should have high technology and high style. So how to add value and what is value in product design? From the perspective of a product, the key terms for values are utility, desirability and overall perceived excellence. If value in its true sense is lifestyle driven not cost driven. In design driven innovation, a value is the services or features a product provides for the price it cost.

A good value is based on the lowest cost with the greatest number of features. The goal must be to keep cost low, profits moderate and sale in mass quantities but the problem is products in the lower left corner also having more features. So a true design sense is required to move from this quadrant to the upper right. So if we would like to add value to a product, we have

to add emotion, we have to add aesthetics, product identity, the impact, ergonomics, core technology and quality.

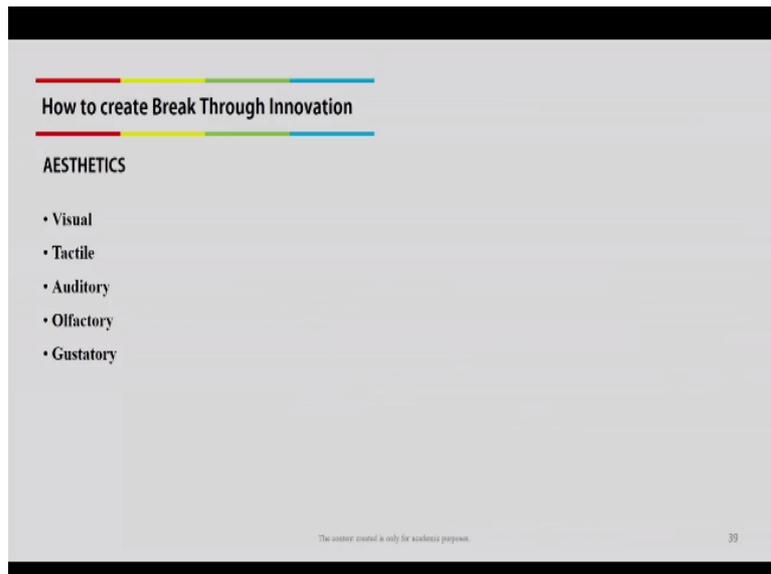
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The emotional contribution defines the fantasy aspect of the product. We can break the attributes of emotions into sense of adventure, feel of independence, sense of security, sensuality, confidence and power. If the product promotes excitement and exploration, then it has sense of adventure. If the product provides a sense of freedom from constraints, then it is feel of independence.

If a product provides a feeling of safety and stability, then it is sense of security. If the product provides a luxurious experience, then it is sensuality. If the product supports the user's self-assurance and promotes his or her motivation to use the product, then it is confidence. If the product promotes authority, control and feeling of supremacy then it is power. So as the product designer, you should always add emotional values, you should try to add emotional values to the product.

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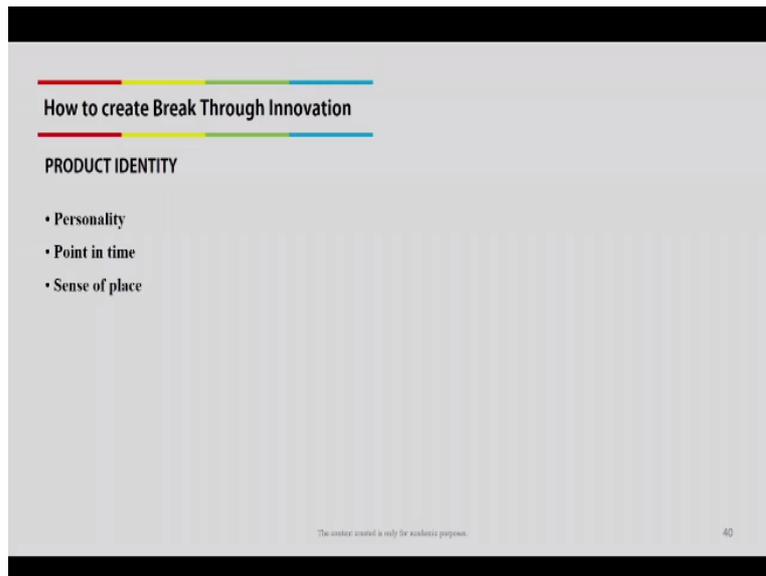


Next is aesthetics, so aesthetic attributes are visual, tactile, auditory, olfactory and gustatory. The visual form must relate shape, color and texture to the context of the product and the target market. Sometime visual form and color must consider religion, gender and age group also. The physical interaction of the product is considered under the tactile attribute. In most of the cases, it is only considered the interaction between the user's hand and the product.

But for example baby carrier, in this kind of product, user is not only interacting with his hand, the product is in contact with the other part of the body. So in this case, the product designer has to consider the interaction between the product and the other parts of the body also. Auditory, the product must only emit the appropriate sound and eliminate the undesired sounds.

The olfactory attributes the product must have an agreeable smell providing appropriate aromas and eliminating undesirable odors. Gustatory attributes product that are designed to be eaten used as an utensil or many or may otherwise be placed in the mouth must have an optimum flavor or no flavor at all.

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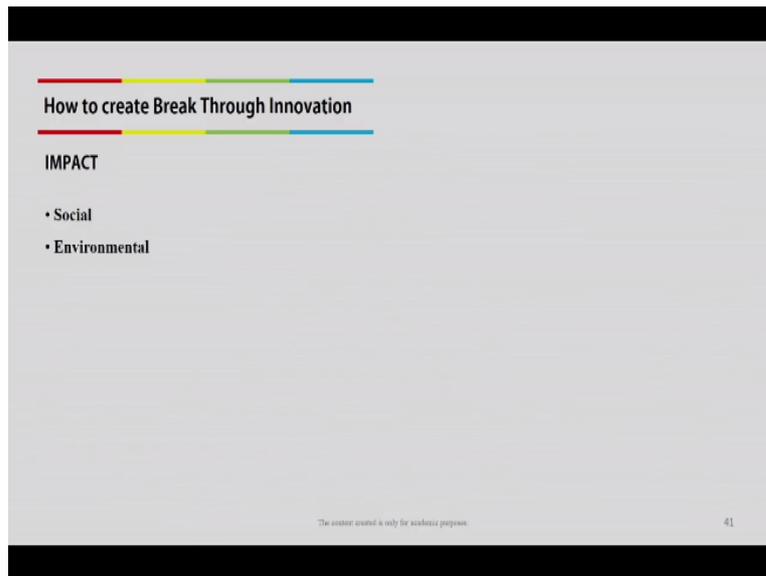
The next value is product identity. So product identity has 3 attributes, one is personality, the point in time, sense of place. So in personality, two things has to be considered. First the ability of the product to fit among yet different itself from its direct competition. If you are going in the market you can see different kind of pen but you are picking the good one, so the best product should have unique selling property but it should have some feature to be called as pen.

Second part is the connection that a product has to the rest of the products produced by that company. If you are buying a particular brand you are actually buying the family. When you are buying a product, the product is coming in your home and it should fit with the other products in your home. So product designer should consider that identity also. Point in time, so in order for a product to be successful it has to capture a point in time and express it in a clear and powerful way.

For example, if you open up a soft drink bottle, you will have a distinct sound so to get that sound company paid lot. So this sound gives you an indication that your bottle is now open. This is point in time. The last part is sense of place. So product must be designed to fit into the context of use.

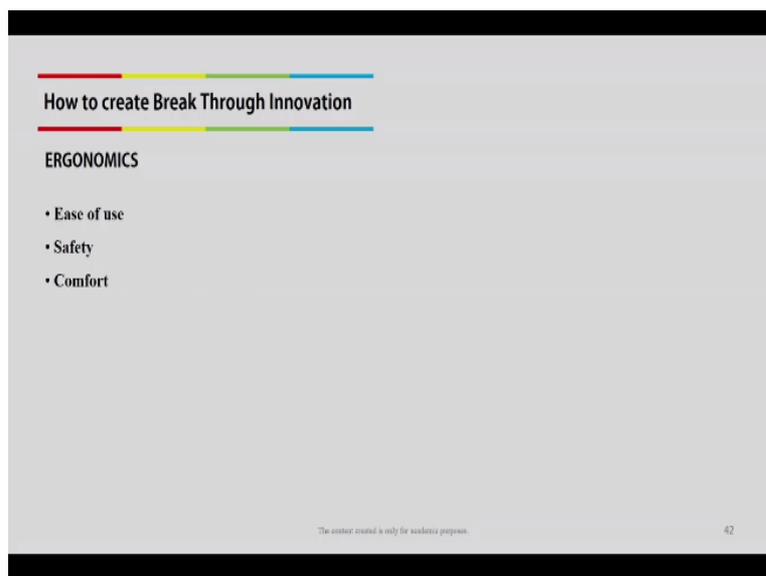
So for example if you are using if you are designing a product for specifically Indian context, you have to see the scenario from Leh Ladakh to Kanyakumari, from Kach to Thawe. So how different religion, different state people will be using that product.

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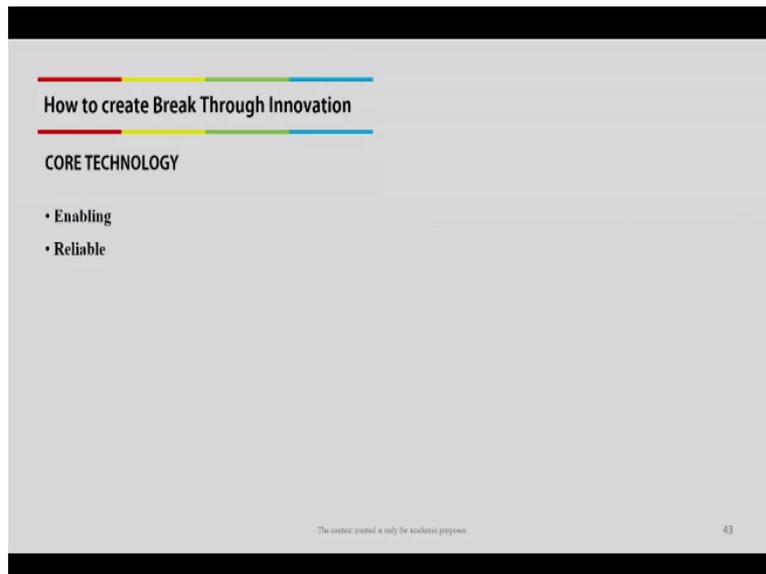
So next value is impact. As a product designer, you should see what will be the impact of your product in society and as well as you should see what will be the impact of your product in the environment.

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Next value is ergonomics. In ergonomics, you have to consider whether the product is easy to use, whether the product has safety or whether the product is giving proper comfort or not.

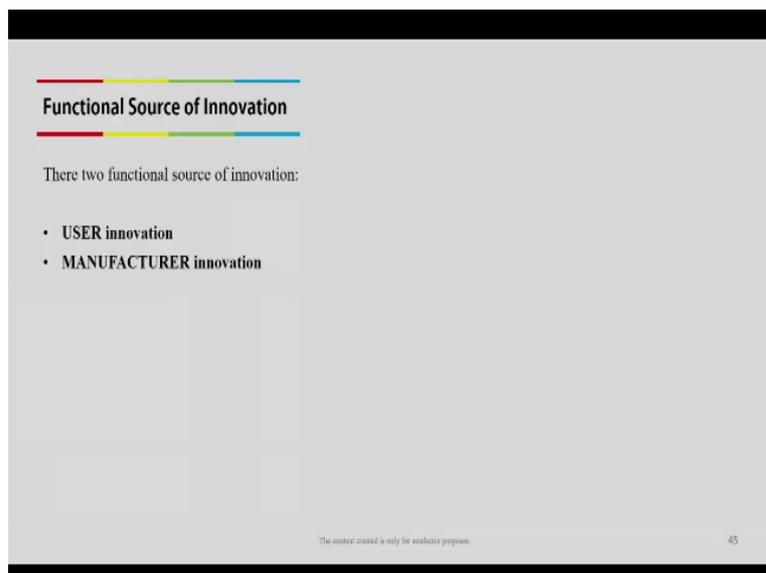
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Next value is core technology. So in core technology two attributes are there, enabling and reliable. In the enabling attribute, core technology must be appropriately advance to provide sufficient features. Core technology may be emerging high technology or well manufactured traditional technology as long as it meets customer's expectation in performance. It is reliable attribute if the product meets the customer's expectations throughout its consumption.

Next value is quality. In quality, you have to consider the craftsmanship, the finish and durability, the performance over time.

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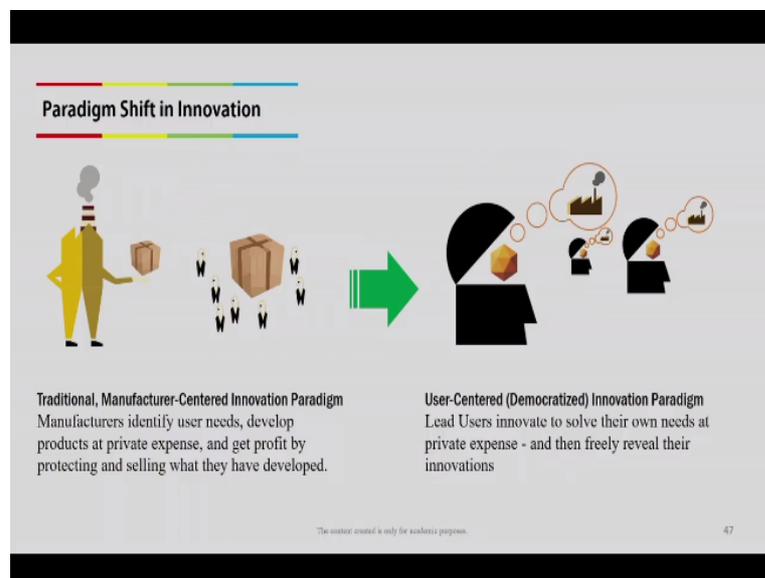


So now we will discuss about the functional sources of innovation. So there are two functional sources of innovation, one is manufacturer innovation and another is user innovation. The functional source of innovation depends upon the functional relationship

between innovator and innovation. An innovation is a user innovation where the developer expects to benefit by using it.

And the innovation is a manufacturer innovation when the developer expects to benefit by selling it. User always tend to develop novel ideas; user always develop novel innovations because user always know the real problem. For example, a professor would like to carry out an experiment and for that there is no instrument and he knows how to make this instrument. Then, he will come up with an instrument which is novel. If manufacturer innovates they will make a better performing instrument of the previous one.

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So now will see how paradigm is shifting in innovation. The previous paradigm was traditional manufacturer-centered innovation paradigm. Manufacturers identify user needs, develop products at private expense and get profit by protecting and selling what they have developed. Nowadays, this paradigm is shifting to user innovation. In user-centered innovation paradigm, lead users innovate to solve their own needs and private expenses and then freely reveal their innovation.

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Story of User Innovation



<https://www.flickr.com/photos/nationalarchives/1054429445/>

Heart lung Machine

In 1930 John H. Gibbon realized the need of a machine which will temporarily take over the function of heart and lungs during surgery.

He approached a manufacturer and due to unclear idea about the machine manufacturer declined his offer to manufacture.

In 1931 he successfully made a prototype and perform a successful surgery.

Rest is history.

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Let us see one story. In 1930, John Gibbon realized the need of the machine which will temporarily take over the function of heart and lungs during surgery. He approached some manufactures and due to the unclear idea about the machine manufacturer declined his offer to manufacture. In 1931, he successfully made a prototype and performed a successful surgery. Rest is history.

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Lead User of Innovation



Lead user is a term developed by Eric von Hippel in 1986. His definition for lead user is:

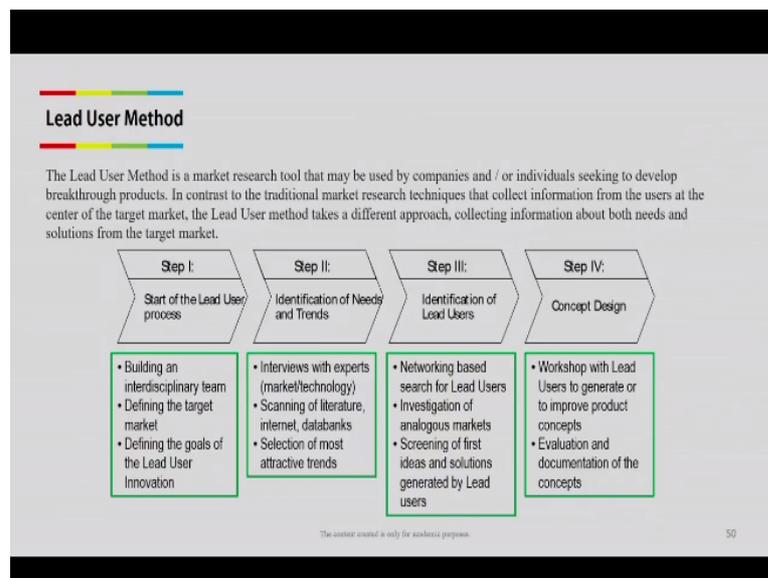
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So now let us discuss lead user innovation. Lead user is a term developed by Eric von Hippel in 1986. His definition for lead user is lead users phase needs that will be general in market place but face them months or year before the bulk of that market place encounters them. Lead users are positioned to benefit significantly by obtaining a solution to their needs.

In simple words, lead users are those users who understand the real problem, they make some innovation and later on these innovations are taken by manufacturers. In the diffusion curve, if we see for long time there are no innovations for particular problem. Lead users are those people who understand the problem and they innovate and later on manufacturers comes and take their innovation and market it.

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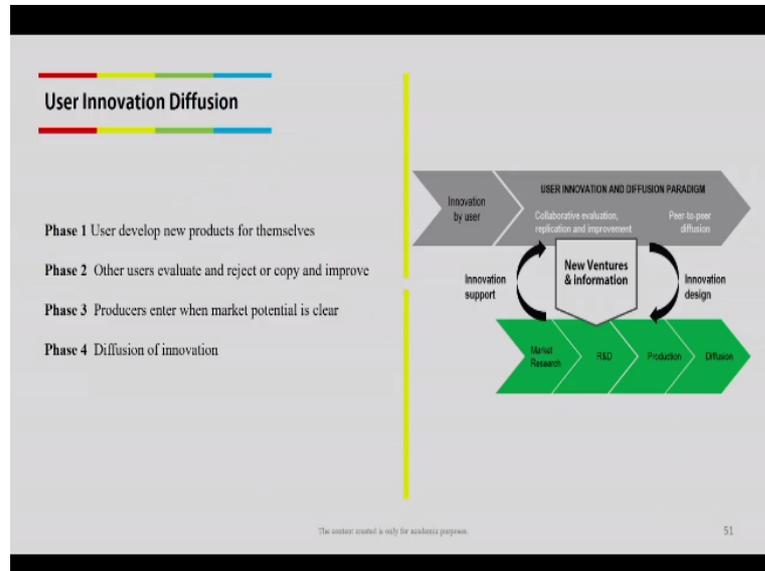
Now let us discuss lead user method. So lead user method is a market research tool where manufacturer identify the lead user and with the help of lead user they innovate and the process is a four-step process. Here in the first step, it starts with the lead user process. Here you have to make interdisciplinary team, define the target and define the goals of the lead user.

In the second phase, need has to be identified through interviews, through literature and discussing with the experts. In the third phase, identification of lead user starts. The manufacturer has lot of networks. They talk to people and they identify lead users and then lead user comes on board and after discussing with lead user the concept design starts but here there is a big problem.

The user might not be willing to openly reveal their innovation to the manufacturer. This is particularly true for industrial users. On the other hand, it seems reasonable that users are probably more inclined towards cooperation with manufactures if they expect to set their solution as a standard in the market or if they hope to get valuable help in return.

Managers of innovation projects need to understand the variables determining both the willingness to freely reveal their ideas and the perceived quality of an involvement in the manufacturer's innovation projects.

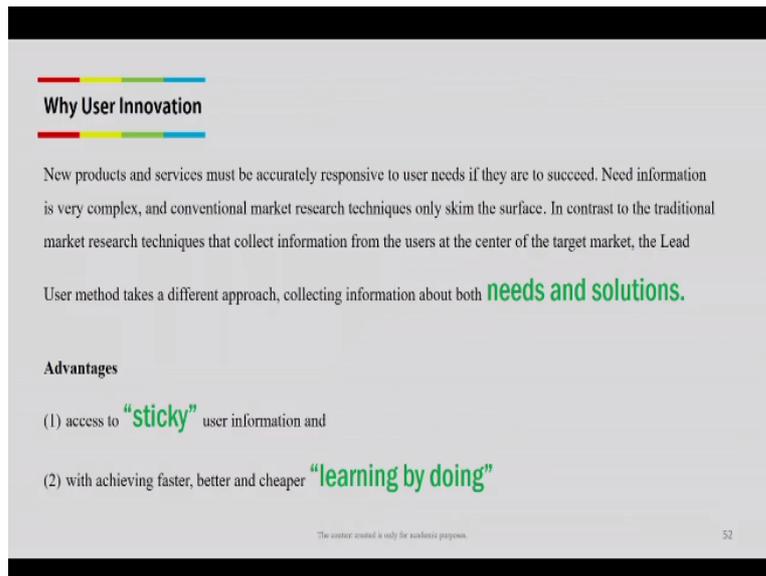
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Now let us discuss user innovation diffusion. In phase 1, user develops new products for themselves because they understand the problem and slowly other users evaluate and reject or copy and improve. There are surrounding peoples who will endorse the innovation, who will adopt this innovation and slowly it will come in the picture of the manufacturer.

Then, manufacturer will make a new venture and the lead user will come on board and manufacturer will help them in terms of innovation support and they will get an innovation design in the market so that is the diffusion of user innovation. Most of the time, user do not have expertise in engineering so manufacturer gives them engineering supports and manufacturing support.

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Why User Innovation

New products and services must be accurately responsive to user needs if they are to succeed. Need information is very complex, and conventional market research techniques only skim the surface. In contrast to the traditional market research techniques that collect information from the users at the center of the target market, the Lead User method takes a different approach, collecting information about both **needs and solutions.**

Advantages

- (1) access to **“sticky”** user information and
- (2) with achieving faster, better and cheaper **“learning by doing”**

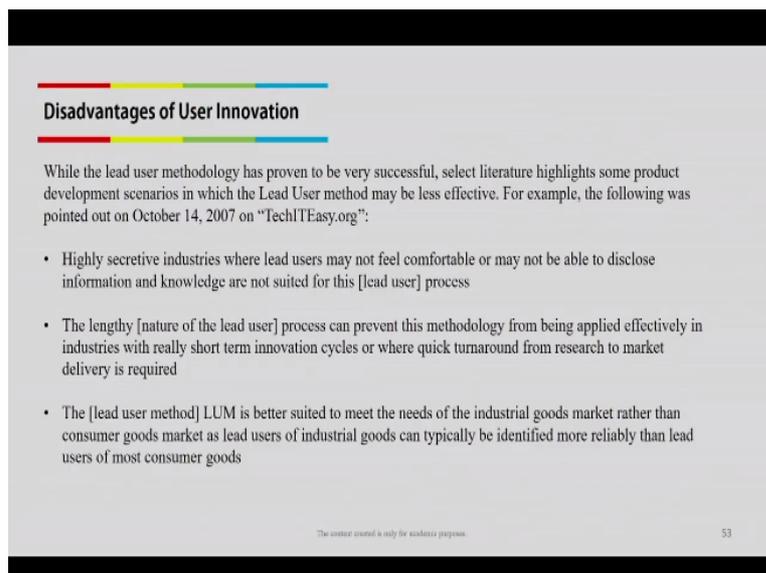
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Why user innovation? There are two major reasons. One is access to sticky user information. So what is sticky user information? Sticky user informations are those informations which are very costly and which takes long time to acquire. So in lead user method, it is very easy to gather those sticky informations from lead users. Second reason is learning by doing in a faster way because the lead user already explored lot many iterations, lot many failures also he faced and it is very easy to understand now what will work or what will not work.

So for manufacturer, it is very fast to learn the process of innovation from lead user. There are some disadvantages of user innovation as well.

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Disadvantages of User Innovation

While the lead user methodology has proven to be very successful, select literature highlights some product development scenarios in which the Lead User method may be less effective. For example, the following was pointed out on October 14, 2007 on “TechIEasy.org”:

- Highly secretive industries where lead users may not feel comfortable or may not be able to disclose information and knowledge are not suited for this [lead user] process
- The lengthy [nature of the lead user] process can prevent this methodology from being applied effectively in industries with really short term innovation cycles or where quick turnaround from research to market delivery is required
- The [lead user method] LUM is better suited to meet the needs of the industrial goods market rather than consumer goods market as lead users of industrial goods can typically be identified more reliably than lead users of most consumer goods

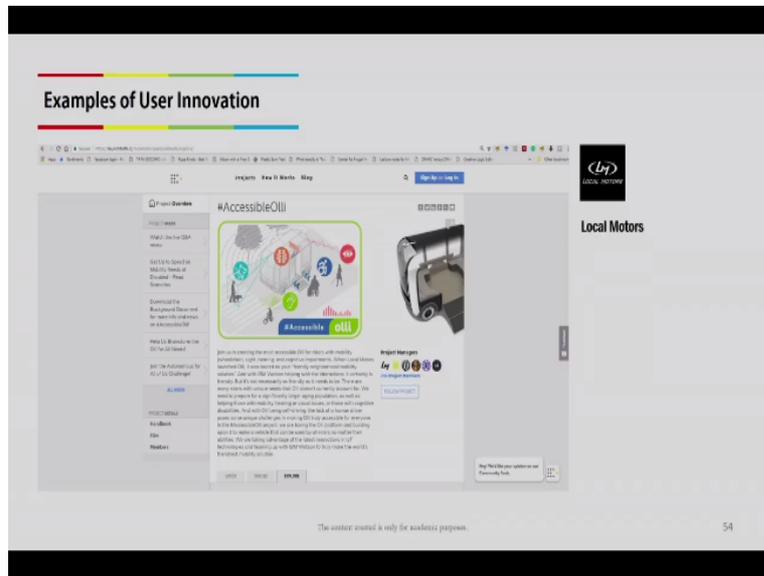
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In highly secretive industries, lead users may not feel comfortable so they may not tell all those informations to the manufacturer. The next disadvantage is the lengthy process. Finding

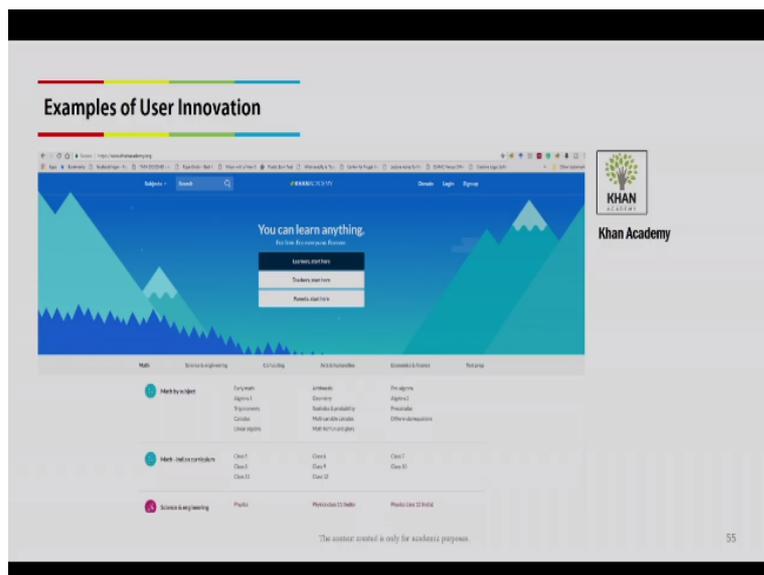
out the lead user and discussing with the lead user, taking out the information from the lead user is a lengthy process. The third disadvantage is lead user method is best suited for industrial goods not for consumer goods because lead users cannot manufacture consumer goods.

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So now see some of the examples of user innovations. So first example is from Local Motors. Local Motors is the first car company to utilize the lead user method to co-create vehicles online with its virtual community of designers, fabricators, engineers and enthusiasts. The world's first vehicle produced using co-creative method is the Local Motors Rally Fighter.

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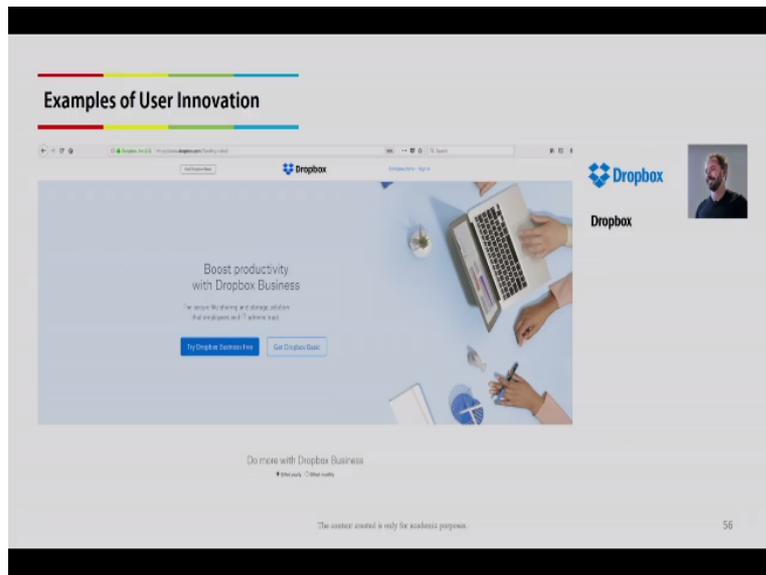


The next example is Khan Academy. So the organization started in 2004 when Salman Khan tweeted one of his cousins on the internet using a service called Yahoo Doodle. After a while,

Khan's other cousins began to use his tutoring services. Because of the demand Khan decided to make his videos watchable on the internet. So he published his content on YouTube and later on he established his own company called Khan Academy.

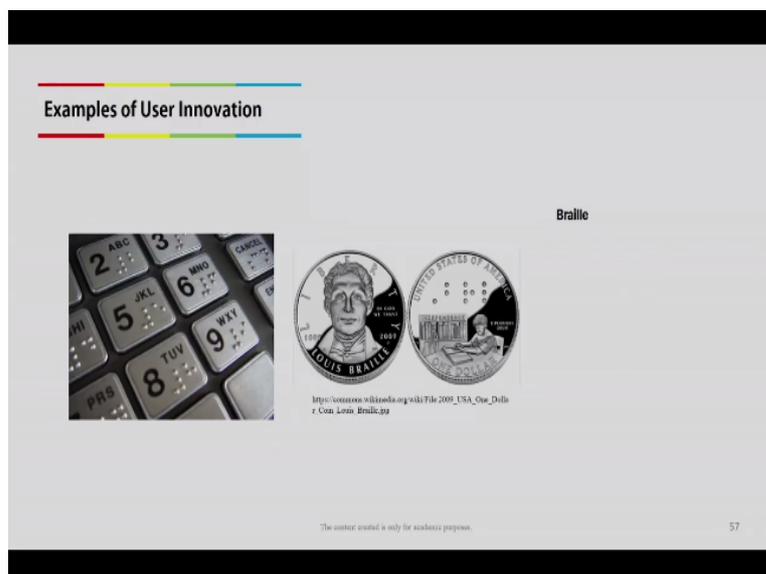
Another story is from the Dropbox.

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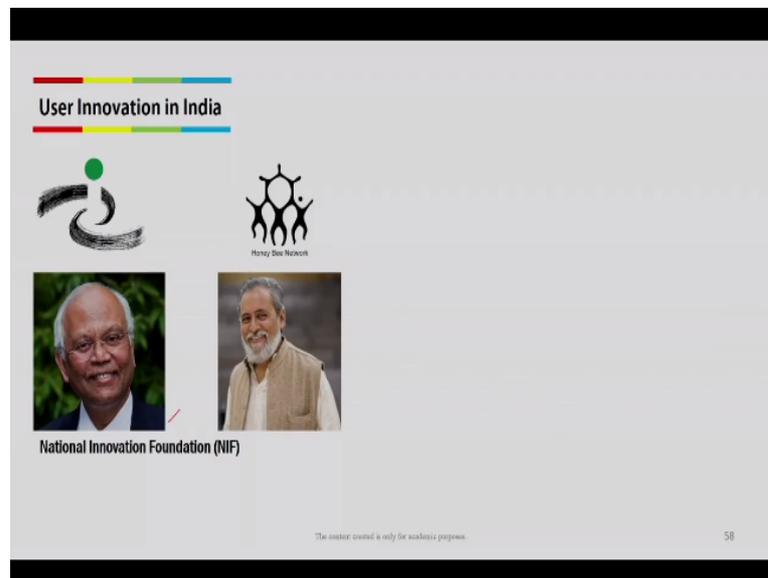
Dropbox founder Drew Houston conceived the Dropbox concept after repeatedly forgetting his USB flash drive while he was a student at MIT. He began making something for his personal use but then realized that it could benefit others also who are facing the similar kind of problem. Houston founded Dropbox in June 2007 and shortly thereafter secured seed funding.

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Another story is from Braille. Braille is a tactile writing system used by people who are visually impaired. Braille used military code called night writing developed by Charles Barbier in response to Napoleon's demand for a means for soldiers to communicate silently at night and without a light source.

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So now we will see how user innovation is happening in India. The Department of Science and Technology DST, India helped to establish the National Innovation Foundation in 2000 with a main goal of providing institutional support in scouting, spawning, sustaining and scaling up grassroots innovations.

The foundation has a governing board chair by Dr. R. A. Mashelkar, former director general CSIR and president Global Research Alliance, professor Anil Gupta, president SRISTI and professor IIM Ahmedabad is the executive vice president is the executive vice chairperson of NIF. For the last 17 years, the Honey Bee network and society for a research and initiatives for sustainable technologies and institutions have been scouting innovations by farmers, artisans, women etc at the grassroots level.

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User Innovation in India

The following activities are undertaken during the Shodh Yatra

1. Felicitation of local innovators and traditional knowledge holders
2. Knowing and understanding local issues and problems of villagers by conducting village meetings
3. Sharing open source information available with SRISTI which may be of use to the local people
4. Identification of centenarians, enterprising women and children, artisans, rural researchers and people contributing to the preservation of natural resources
5. Preparing of a register of local knowledge and local plant diversities
6. Promoting low cost and sustainable agricultural technologies

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What actually they do? They go for Shodh Yatras where they find out lead users, then they talk to them, they protect their innovations by patenting them and also they support them to market those products.

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User Innovation in India



<https://www.youtube.com/watch?v=1244vddiub->
<https://www.innovation360.com/1244vddiub->

Pomegranate De-seeder
It separates the outer cover and thin inner membrane without damaging the seeds. It has a capacity of de-seeding 50-55 kg of pomegranate fruits per hour. The machine has been exported to Turkey and USA.



http://bit.ly/innovation360_mosquito36

Solar Mosquito Destroyer
One fine day he noticed a large number of mosquitoes swarming around the waste tank constructed near the cow shed and entering through a small gap between the concrete slabs covering the tank. He used this phenomenon and combined with green house effect to make a mosquito destroyer



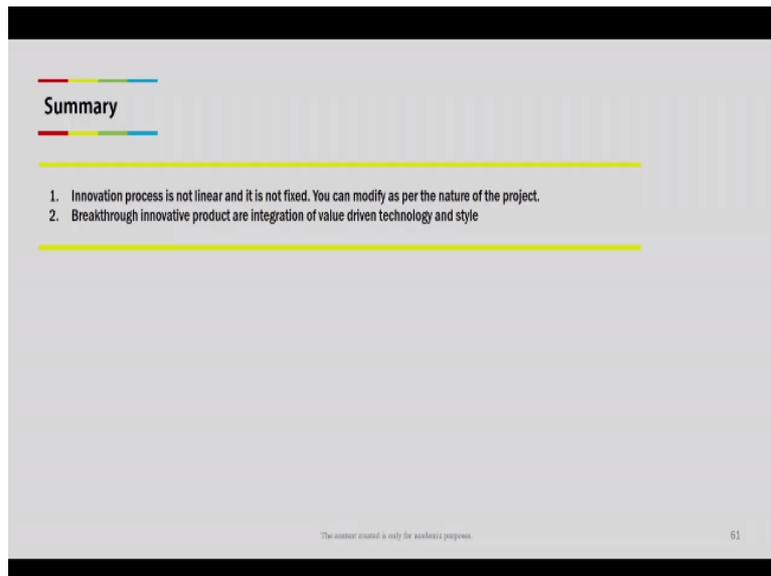
http://bit.ly/innovation360_washing_cum_exercise_machine312

Washing Cum Exercise Machine
It is designed to reduce labour and to use as exercise unit.

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Here are some examples from NIF where pomegranate de-seeder machine, solar mosquito destroyer and washing cum exercise machine was developed. You can see here the way the innovator made with the easily available materials he made a prototype and there also how the innovator used the parts of the cycle and a crude prototype was made.

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So now we will discuss the summary of the today's lecture. First important point is innovation process is not linear. According to the need of the project, you can start at any point. You can do it again and again, it is not like from one step you have to jump to the next step, it can be nonlinear also. Second important point is breakthrough innovative products are integration of value-driven technology and style.

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So now here I will end my lecture with this quote, everybody can be an innovator provided they connect the unconnected things. So be ready to innovate. Thank you.