Business Development From Start to Scale
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Week - 05
Connecting with Customers
Lecture - 23
Market Research and Design Thinking

Hi, friends. Welcome to the NPTEL course Business Development from Start to Scale. We are in Week 5 with the theme of Connecting with Customers. In this lecture, the 23rd in this series we discussed the topics of Market Research and Design Thinking.

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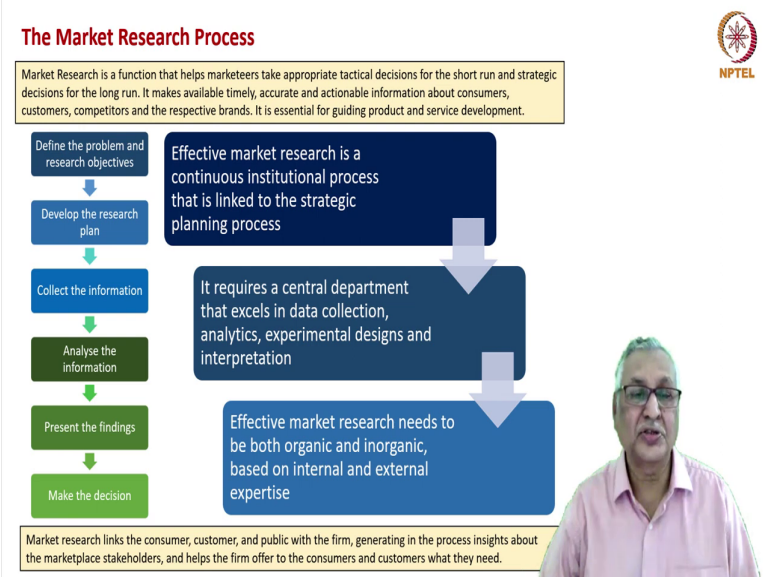

We have seen the complexity of customers as a canvas and the challenges in understanding the customer mindsets. We also tried to find out some templates for achieving homogeneity within the heterogeneity that the market represents. We also understood that market research is an important process of marketing that will help us understand the markets and the customers better.

Market research is a function that helps marketers take appropriate tactical decisions; please remember this appropriate tactical decisions for the short run and strategic decisions again remember this strategic decisions for the long run. So, marketing it requires market research to lead us to new products, but also to ensure that the existing products are better served for the customers.

It makes available timely, accurate and actionable information about consumers, customers, competitors and respective brands. It is an essential item in the marketing toolkit it helps product and service development. What does market research do? It is a continuous institutional process.

It is linked to the strategic planning process and strategic planning itself requires marketing strategy as one of the important pivots. It comprises a central department that excels in data collection, data analytics, experimental designs and interpretation. Effective market research needs to be organic as well as inorganic, based on internal and external expertise because the market is so vast that it is impossible for a small team within the company to cover the entire market.

What are the steps involved in the market research process? First you must define the problem and the research objectives. Next you should develop the research plan, what am I going to research about; collect the information; analyse the information; present the findings and make the decision.

Market research links the consumer, customer and public with the firm. It generates in the process several insights about the marketplace stakeholders and helps the firm offer to the

consumers and customers what they need. So, some of the questions which market research poses are as follows.

One – why is my product not being sold as much as it was being sold why is the competitors product getting sold more than my product; what are the changes in consumer thought processes that are leading to this dichotomy between my product and the competitors products; is there anything good or bad about how my retailers are treating my products.

What are the main features the consumers are looking for in my product; is there any loyalty or connect with the product the brand or the company. How can we make the customer more fulfilled or more satisfied by our services; what are the specific top 5 steps we will need to reposition our brand for greater growth and better profitability; what is the importance of pricing in determining market growth.

How price elastic is my product; what is the importance of incentive schemes discounts for the retailers to sell my products; what are the types of retailers or what are the types of trade channels that are patronizing my product. And, we can go on and a number of questions can be developed and these can be answered through the market research process.

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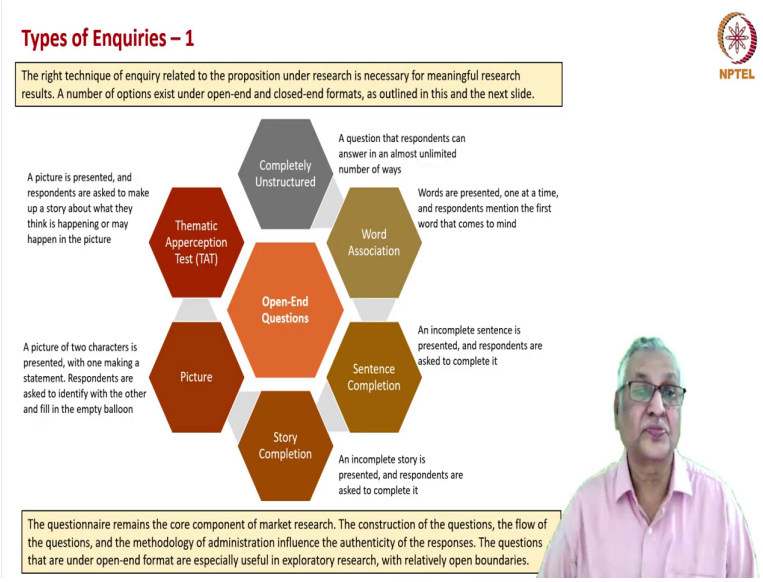

The right technique of enquiry related to the proposition under research is necessary. Without the right question and the right technique, the research will not be meaningful. We can have open ended questions we also can have closed ended formats. So, we can have market research which is completely unstructured.

You can go to a customer without any questions preset and a question can be asked and customer can answer in any number of ways. Or you can go with a set of questions ask those questions, but do not give any choices the customer again can answer in any number of ways.

The second is to go with certain keywords and these keywords are associated with certain consumer feelings, appreciations and behaviours when words are presented one at a time respondents mention the first word that comes to mind. The third one is sentence completion

that is you propose like saying I like Gold Winner brand because then the customer is encouraged to fill it up.

Again, there are no ABCD in this then you can present an incomplete story and respondents are asked to complete it. When I started my ice cream parlour there were many customers used to come throughout the day thereafter the customers who are coming got themselves grouped into the daytime customers only. Why do you think this has happened?

Another way is to present a picture and then ask the customer to derive a response from this a picture of two characters is presented with one making a statement. Respondents are asked to identify with the other person and fill in the empty box. A picture is presented and respondents are asked to make up a story what they think is happening or may happen in the picture.

Again, taking the case of the ice cream parlour, you may present a particular model of ice cream parlour and then ask the people to visualize the likely footfalls, the likely interactions and the likely sales pattern that could occur in such a parallel.

The questionnaire however, remains the core component of market research. The construction of the questions, the flow of the questions and the methodology of questionnaire administration influence the authenticity of the responses. The questions that are open-ended format are usually helpful in exploratory research, with relatively open boundaries.

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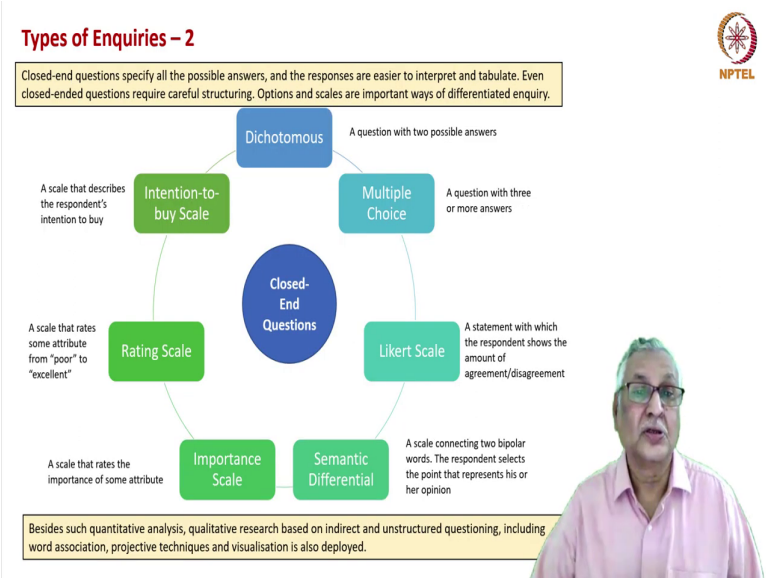

Again closed-ended questions are also there in the market research canvas where closed ended questions specify all the possible answers and the responses are easy to interpret and tabulate. Even closed-ended questions require careful structuring there is science behind the closed end questioning tool.

Options and skills are important ways of differentiated inquiry. You should have statistical tools to grade the questions, rank the questions, provide weightage to the answers and so on. Some of the examples of closed-end questions are a question with two possible answers that is called a dichotomous question.

There could be multiple choice question where a question has three or more answers. Likert scale is a methodology by which a statement with which the respondent shows the amount of

agreement and disagreement points us to the respondent thinking process. We see this happening all the time in culture studies.

We may have a question such as, my company treats its employees respectfully – strongly agree, agree, neutral, disagree, strongly disagree. That is the Likert scale. Then there could be semantic differential a scale containing two bipolar words. The respondent selects the point that represents his or her opinion.

Then there is the importance scale a scale that rates the importance of some attribute. I like a dairy product which is thick and creamy, which is white in colour, which is included with flavours, which is having fruits, which is having multiple colour shades and then the customer is expected to rank these things.

Then the rating scale a scale that rates some attribute from poor to excellent intention to buy scale a scale that describes the respondents intention to buy. Besides such quantitative analysis, qualitative research based on indirect and unstructured questioning, including word association, projective techniques and visualisation is also deployed.

And, at the very least we have some any other points kind of questions that are asked. When you go through a food delivery application there is some kind of minimal survey that happens plus comments that are solicited in terms of the nature of the food, what else could be done by the delivery company or the restaurant and so on.

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What are the seven characteristics of good marketing research? There are seven factors by which we can identify good marketing research. One – it must be of scientific nature. There must be careful observation the hypothesis must be properly formulated. They should be tested for their response integrity and the testing must be continuously iterative.

Second is the research creativity usage of creative prompts and comparators to read the customers mind. The third is the multiple methods that is using more than one method to bring out multiple dimensions. Going back to the previous example, you could do application of two types of scales to be able to get at the answers or within the same questionnaire you can use more than one type of questioning.

Or you can use a quantitative technique with qualitative technique or you can use open-ended questions together with closed-ended questions. So, multiple methods can be used to judge

the answer or completely you can use quantitative research first and then come up with qualitative research next within the same customer group.

Models and data must be scientific and statistically born out. Data must be realistic and models must be meaningful. Value and cost – at the end of it, every market research assignment costs lot of money. So, we have to estimate the value of information that we get vis-a-vis the cost of collecting and analysing the information.

We should also be pretty evaluative and objective about the market research. We should be able to overcome legacy biases, we should be data based, but without losing the overall context. We should also subscribe to ethical marketing that is we should meet the privacy standards of the individual.

It is not necessary that every respondent should indicate or include his or her personal details, while there may be questions related to that the option is entirely to the respondent whether to answer those questions or not. Similarly, ethical marketing standard should be deployed.

That is there should not be any disparaging of the competitor products while you are seeking responses to your products. So, market research is not a simple process, it is one that can be contextualised and enriched. I must also say at this point of time that market research is also called marketing research we use this term interchangeably that is market research or marketing research.

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There is a need for creativity in marketing research. Marketing research should not be routine and boring. It should be exciting and inclusive to the respondents. It is not a research to be conducted with 100 questions and then seeking responses. There must be an inclusivity embedded in the market research process.

Some of the ways in which you can have creative market research are the following. One you should have visual explainers and comparators like do you like this kind of speaker or this type of speaker; do you prefer a smart phone with this color combination or with this color combination; what is the form factor you are liking the most.

So, the visual explainers when presented will help the respondents make correct and precise choices. The second could be participative thinking that is we should not treat the whole

process as mechanistic or robotic. You should enable the customer to think for a while participate in this process of market research.

Third is where appropriate depending on the nature of the product you could use emotional pivots that is a questions such as what makes the product connect with your family in the overall or what from your family experience makes the product particularly suitable to your family or to your personal needs.

So, evoking the emotionality of the product experience could be one way to understand whether marketing on the trend could be successful for the product. Then you should look at digital simulation various kinds of tools are available today AR, VR, MR and also interactive digital gamification.

All those things can be deployed to understand how the actual situation can be simulated digitally for the respondents to appropriately provide the viewpoints. Then you should have time for reflection. Any question should be one that will enable the respondent to reflect rather than give kneejerk reactions.

And, there must be self-evaluation as part of the market research on the part of the question and person as well as on the part of the respondent. Basically, we should move market research from the question part and ticking methodology to digital inclusivity. And, by using digital technologies there can be significant stimulation and holistic comprehension that could come out of market research.

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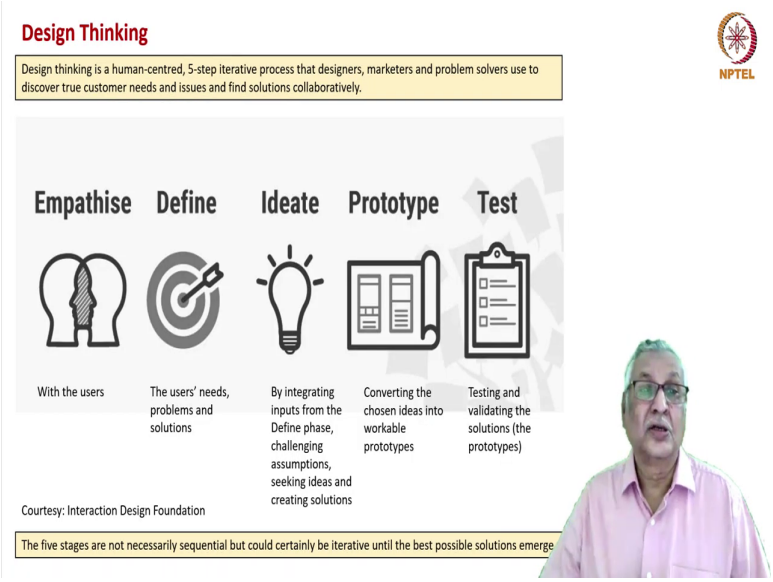

Having talked about market research, we should talk about design thinking. Design thinking as I said in the previous lecture is the next level of understanding the customers' requirements and gaining customer insights. Design thinking is a human centred 5-step iterative process the designers, marketers and problem solvers use to discover true customer needs and issues and then find collaborative solutions.

So, there are five steps of any design thinking process: empathise, define, ideate, prototype and test. Empathisation happens with the users; definition happens in respect of the users needs problems and solutions; ideation happens by integrating inputs from the defined phase and from challenging assumptions that are set seeking new ideas and creating new solutions.

Prototype is the process of converting the chosen ideas into workable prototypes and test is the methodology to ensure that the concept is proved and the prototype is proved. Various

solutions that is the prototypes are tested based on certain standard specifications and process to see what could be viable and what may not be viable. These five stages are not necessarily sequential but could certainly be iterative until the best possible solutions emerge.

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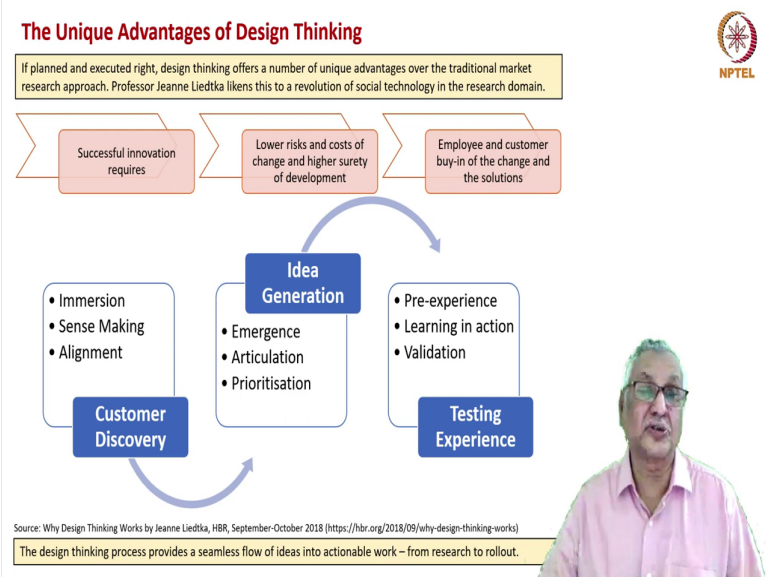

So, how do we apply design thinking to various processes and why should we first of all apply design thinking? If we do the design thinking process in a proper manner, it offers a number of unique advantages over the traditional market research approach. The professor Jeanne Liedtka likens this to a revolution of social technology in the research domain.

Successful innovation requires lower risks and costs of change and higher surety of development. Employee and customer buy-in of the change and the solutions occurs because innovation is bringing in something very new not seen before and any change of that nature will entail risk and risk need to be accepted.

And, this process itself must be error proof as possible and as assured as possible. For that if you have the buy-in of the employees and customers in respect of the change, the solutions would be better embraced. So, there are three steps within design thinking that will lead to this.

One is customer discovery how immersive is our customer discovery process, how good we are from the making of sense out of consumer experiences and how aligned we are as company representatives and the customers. Then how do we generate the ideas? Usually, an emergence of idea occurs as a speck of thought, then it needs to be further amplified articulated.

And, then ideas need to be prioritised and even within one single idea there could be several facets which need to be prioritised, then we should have the testing experience. Pre-experience in terms of look and feel of the prototype, learning about it in action and finally, validating it in terms of supporting our concept and supporting our product requirements.

But the design thinking process doubtless provides a seamless flow of ideas into actionable work from research to rollout.

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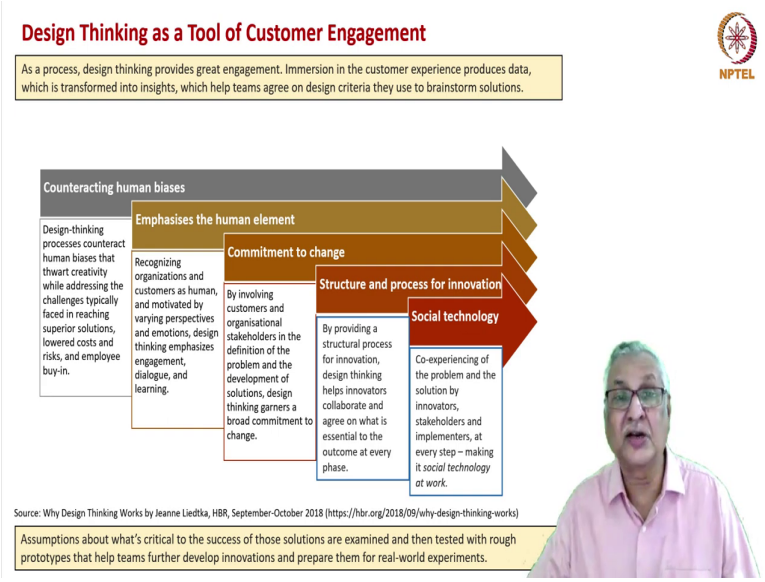

It is a tool of customer engagement. We have heard about or read about (Refer Time: 18:48) experiments wherein there has been an improvement in productivity because of the supervisors providing attention to the working conditions because of the supervisors engaging in talks with the team members.

And, the productivity increase has been stupendous as per the (Refer Time: 19:06) experiment. Similarly, when you engage with the customers the loyalty of the customers to what the company wants to do would improve and that would lead not necessarily to sales, but it would certainly lead to the customers coming up with bright ideas; ideas which actually solve the problem.

So, as a process design thinking provides great engagement. Immersive customer experiences produces data which is transformed into insights and which helps teams agree on design

criteria they use to brainstorm solutions. In this we have to take care of five important factors.

First, we should counteract the human biases that are integral to our thinking. When you draft a questionnaire you have already biased yourself by saying that possibly this is the question that need to be asked and this is the response set that needs to be considered while responding. Whereas, design thinking process are so open-ended that biases are not expected to be there.

There could be there, but they cancel out each other. Biases typically thwart creativity and they cannot address challenges in a biased environment. Therefore, when you have biases removed, we can reach superior solutions, we can reduce the cost of discovery as well as product development, the risks are minimized and employee buy-in happens.

Second – design thinking helps us empathize with the human element. We are telling the customer that we care for you and we care for how your product works in your hands. Recognizing organizations and customers as human and motivated by varying perspectives and emotions, design thinking emphasizes engagement, dialogue and learning.

Third – there is a commitment to change. We involve customers in the design thinking process. Therefore, they become stakeholders in the organizational activities. They become stakeholders in the definition of the problem and the development of the solution. So, broader commitment is corner to the change.

The fourth dimension is that it provides a structural process for innovation. It is an innovation in the marketplace. It is a Gemba innovation because you are working in the field along with the customer or in a special stylized area for you to come up with the brightest of ideas and develop the best of the prototypes.

So, it helps innovators be they remain as customers or be they be or be they remain as company representatives. They are all innovators. They collaborate and agree on what is essential to the outcome at every phase. And, the fifth one is the social technology dimension.

The company is co-experiencing the problem as well as the solution through the design thinking process.

In the normal course when a problem is brought by the customer the first thing which the company looks at is whether the product is under the warranty period or not. The response varies immediately depending on whether the product is in the warranty period or not.

The commitment to self-cost of the customer is brought out. Then questions will be there and most of the questions somewhat investigative and critical finding out. How the product has been used or misused and trying to limit the company's liability in the servicing of the product; whereas, in the case of design-thinking, the company lets itself free.

The representatives are expected to be open transparent in experiencing the customers' problem and become one in terms of a social networking and that is social technology at work. So, assumptions about what is critical to the success of the solutions are examined and tested in detail along with the customers and that helps a more robust and more durable solution development with real-world experiments.

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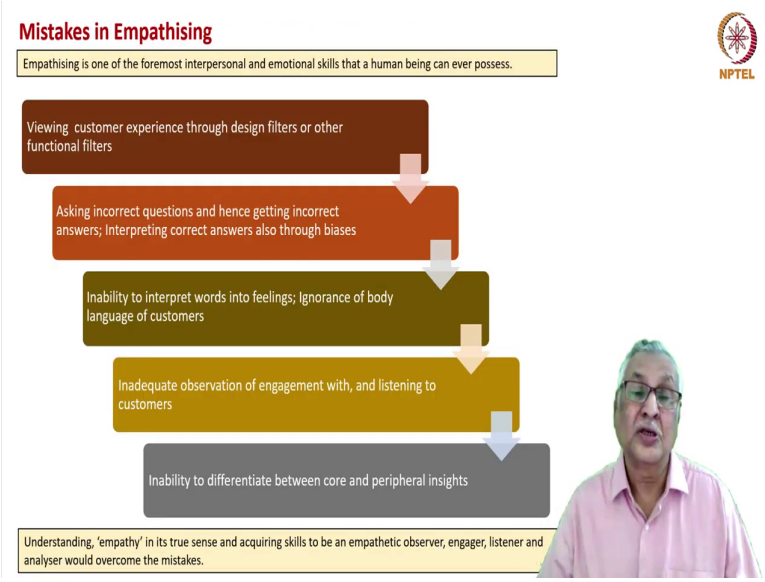

But this process also goes through certain mistakes more particularly in the first phase of empathizing. It is a foremost interpersonal and emotional skill and empathy is not easy to get. And, when you say that empathy has to be there on the part of the company representatives, it is a tall ask.

That is why people who engage in design thinking on the part of the company must be specially trained or specially developed people. One or the other mistakes as follows will occur in the design thinking process. Typically, people use customer experience as once passing through our design filters or other functional filters.

That is I have designed this product for this level of use the customer is wrong in using the product that way may be true from a technical sense, but the fact is that you have enabled the

customer to use the product by virtue of your offering or by virtue of your claims or others experience.

So, it may not be a correct way to view it in terms of go no go kind of approach towards categorizing the problem. Second – we could be asking incorrect questions particularly because the open method of understanding. Therefore, you get incorrect answers as well. Interpreting correct answers may also happen through biases. You may also have the biggest problem that is interpreting words into feelings.

Customer may say something because of the language the customer uses or the expression the customer brings to the word but, it is impossible to translate equally the feelings from the words. Therefore, there is a problem there and the second problem is that the design thinking people, forget the body language as an important part of the communication focus is more on the answers by words.

Then there could be an inadequate observation of engagement with and listening to customers. Suppose design thinking activity is being held and there are five customers if only one customer is articulate and the other four customers are indifferent, it means that the design thinking activity is not proceeding in the right manner.

Then, the fifth one, inability to differentiate between core and peripheral insights. When you have an open discussion on the problems and solutions you are likely to get n number of ideas, but we should be able to differentiate what constitutes the core and what constitutes the periphery. Of course, all are important, but one drives the product development for more than the others.

So, understanding empathy in it is true sense and acquiring skills to be empathetic in observation engagement and listening, and finally, in analysis would overcome the mistakes. This is important.

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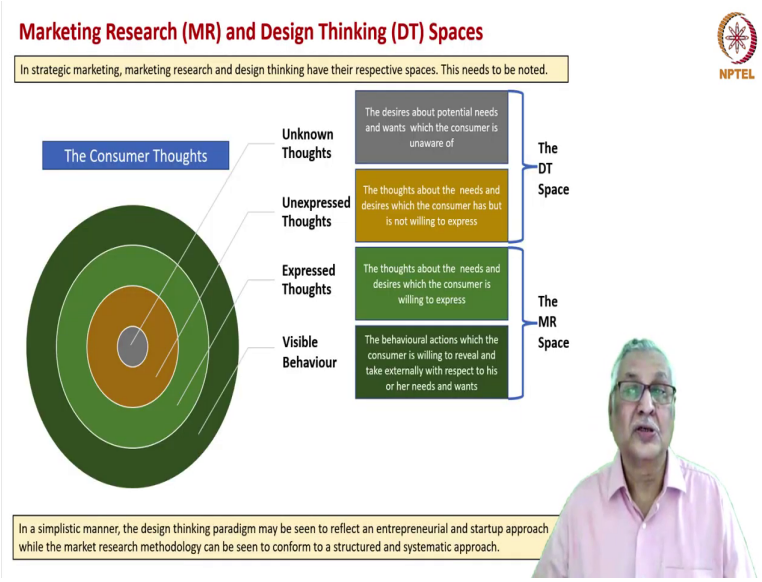

So, what is the connectivity or the differences in the marketing research and design thinking spaces? In strategic marketing, marketing research and design-thinking have their respective spaces this needs to be noted. When consumer thinks or is considered to be thinking, the consumer experiences the following thought process: one – unknown thoughts; second – unexpressed thoughts; the third – expressed thoughts and fourth – visible behaviour.

So, any action of consumer engagement must be to discover the unknown thoughts, make those thoughts expressed and make the expression more precise and more helpful and finally, get a visible behaviour that reflects the thoughts. So, when you think about unknown thoughts what is it? The desires about potential needs and wants which the consumer is unaware of.

The consumer is using a particular product but, he or she does not understand what else the product could help him or help with and what else the consumer needs either with this

product or any other product. What are unexpressed thoughts? Unexpressed thoughts are the thoughts about the needs and desires which the consumer has, but is not willing to express.

This may happen with reference to personal appliances, it could happen with reference to the personal care products, it could happen with certain types of symbolic products – all these things may make the customer become shy about explaining the features. So, we should be able to understand it in non-inclusive and helpful way.

These two aspects, that is, getting the customer to know what the customer is unaware of and getting the customer to explain or express the thoughts in a meaningful manner or truly the design thinking spaces. Then we have the express thoughts about the needs and desires which the consumer is willing to express.

Then we have visible behaviour – the behavioural actions by which the consumer is relating himself or herself with the product and also willing to make this obvious whoever is interacting with him or her. This is typically the MR space. This is not to say that the design thinking space cannot extend into the MR space.

So, in a simplistic manner the design thinking paradigm can be seen to reflect an entrepreneurial and start-up approach, while the market methodology can be seen to conform to a structured and systematic approach. This is one reason why market research has taken root in the mainstream companies and design thinking has taken root in start-up and entrepreneurial companies.

But today everybody is recognizing the importance of extending design thinking to every new product development and every new product improvement.

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So, the engagements which we are doing as part of the design thinking process have to be holistic comprehensive. You should have several facets to that one it must encompass consumer research to understand the problem. We should deploy technology to find out solution platforms.

We should do Gemba walks that is be in the field be in the actual usage situation to understand the inter linkage between the problem and the solution. We should sketch the solution so that we understand the initial way of doing things. We should challenge by pressure testing; we should freeze the design solution in terms of a final design.

We should understand how to translate this into actual manufacturing which is an initial manufacturing solution. We should understand the viability not only for the company, but for the customer and finally, come with a pathway to prototyping which is a product plan.

So, in all these aspects the customer will be involved although the customers involvement could be far greater in ideation prototyping and testing stages and a bit less in terms of understanding the viability manufacturing and things like that. However, we need to create the holistic solution first, then refine it, then repeat the process and design thinking does not happen as just one sequential value chain.

It is highly iterative and highly complementary to each component of the design thinking process.

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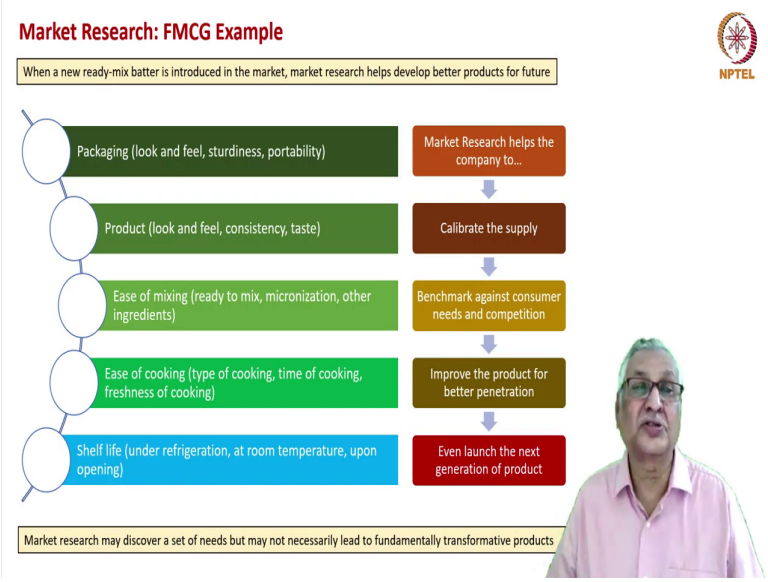

Let us look at market research in terms of FMCG example. When a new ready-mix battery is introduced in the market, market research helps develop better products for the future. Packaging, the look and feel of the packet, the sturdiness and portability. The product itself that is the better.

The look and feel, consistency, taste and also any smell that comes from the product when it is open from the package. Then the ease of mixing ready to mix micronization, other ingredients. Ease of cooking – time taken to cook, the type of cooking that is required the freshness of cooking.

Then, the shelf life – should it be kept under refrigeration, at room temperature or any other way upon opening. Now, market research in this case helps the company to; calibrate the supply; benchmark against consumer needs and competition activities; improve the product for better penetration and even launch the next generation of product in a more meaningful way.

Market research fundamentally discovers set of set of needs, but may not necessarily lead to fundamentally transformative products. That is the advantage as well as the limitation of market research.

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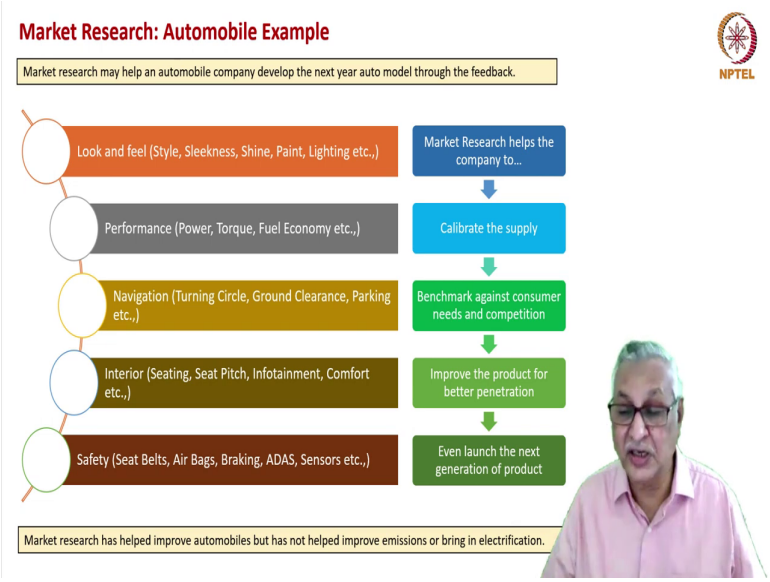

Now, let us look at the automobile example. Market research may help an automobile company develop the next year automobile model through the feedback. So, what are the items that would be considered as part of the market research? Look and feel of the product, style, sleekness, shine, paint, lighting, decor etcetera. Performance – power, torque, fuel, economy, etcetera.

Navigation in terms of the turning circle, ground clearance, parking, etcetera. Then interior – the seating, seat pitch, infotainment, comfort, etcetera. And, safety – seat belts, airbags, braking, ADAS, sensors, etcetera. Market research helps the company again to calibrate the supply of automobiles, benchmark against consumer needs and competition, improve the product for better penetration and even launch the next model for the next year.

Market research has certainly helped improve automobiles, but it has not helped improve the emissions or bring in electrification. These have happened due to the requirements from the regulators or from the entrepreneurial passion of certain companies and certain founders to take the automobile to the next level.

So, market research has its limitations. It is not going to be a substitute for strategic thinking and entrepreneurial passion, market research cannot do that.

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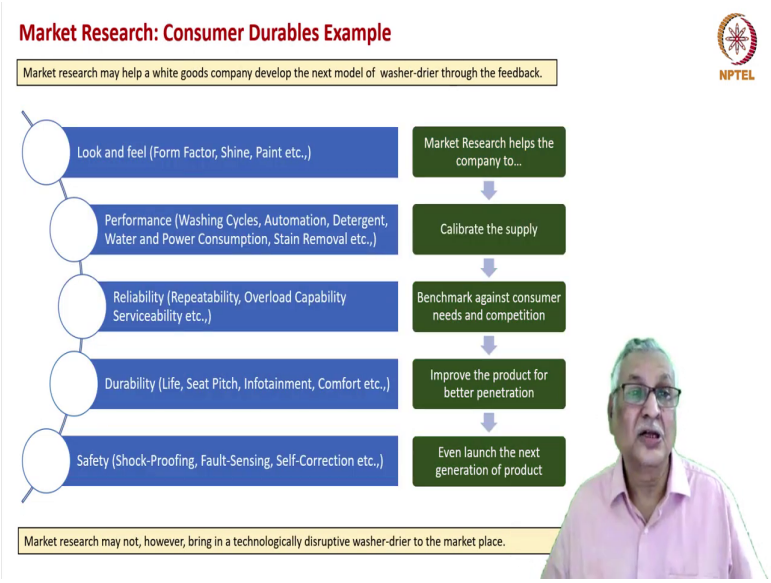

Let us take the example of market research from consumer durables. So, what would you look up to in a washer drier as an example? You look at the overall form factor, the feel of the machine, you look at the way it is painted and brought up, the way it is easy to hold in terms of the door and so on.

Then you look at the performance, washing cycles, automation, detergent usage, water and power consumption, stain removal, how focused it is in terms of different types of clothes and so on. Reliability that is repeatability, overload capability, serviceability, if you try to open the door while the machine is in operation what would happen, what are the feel safe methodologies that are built in etcetera.

Then you look at the durability that is how many washing cycles it can take even under the fullest load; what can you do to ensure that the mixed use of clothes is managed; what is it is sensitivity to different levels of water input that happens in our normal households. Those are the questions which the market research will answer in those areas.

Then, you have safety, that is – how do we make it shockproof, fault sensing, self-corrective. Again, same things how market research help the company in respect of better supply chain planning better product development and better manufacturing delivery, but will market research bring in a technologically disruptive washer drier to the marketplace? Question is doubtful.

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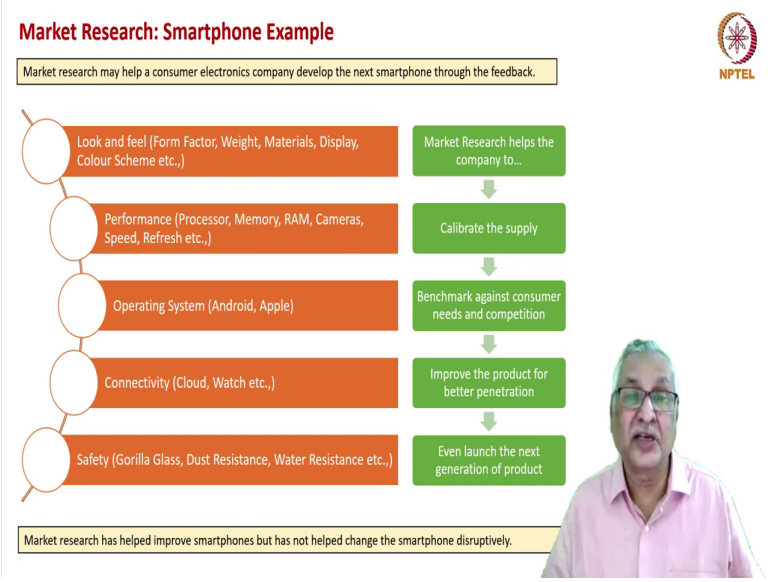

Then, you have a smart phone. Market research again tells us about the form factor, weight materials, display, color scheme of the phone. Talks about the processor – memory, RAM, camera, speed, refresh etcetera. Looks at the way the operating system has been improved over time Android or Apple.

The connectivity to cloud to the smart watch and even IOT and, the safety of the smart phone in terms of the protective nature, dust resistance, water resistance and the glass itself. So, market research has helped improve smartphones, but again has not help change the smartphone disruptively.

So, I am giving this example to say that market research is extremely useful, but it cannot be used to substitute strategic judgment we need to have.

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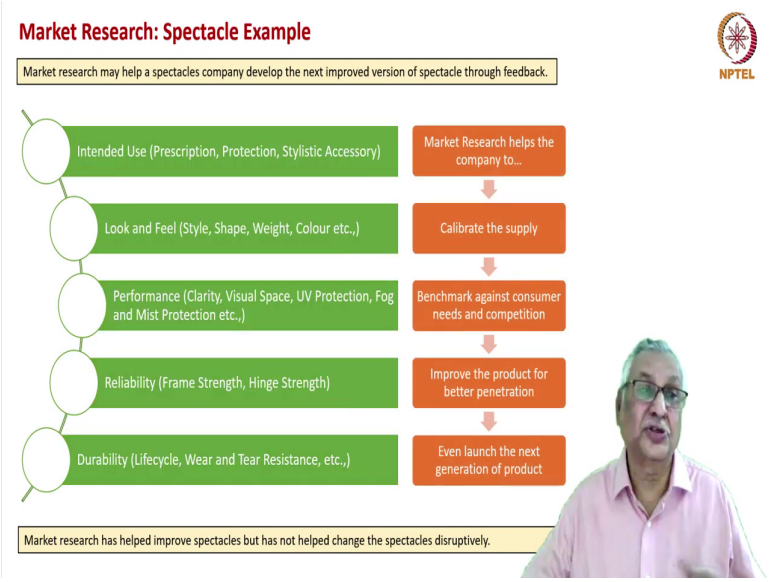

Now, we are looking at a spectacles example. We want to have an improved version of the spectacle. Now, to be able to do that we need to understand the intended use – prescription, protection, stylistic accessory, what would be the area of operation. Look and feel – style, shape, weight, colour etcetera.

Performance – clarity, visual space, UV protection, fog and mist protection etcetera. Reliability – frame strength, hinge strength. Generally. You are expected to move these spectacles from your ears in a particular manner. You should do that way or can it withstand certain degree of abuse. Durability – life cycle, wear and tear resistance etcetera.

Market research has certainly helped improve spectacles, but again has not helped the spectacles change in their basic constitution. It has not disrupted the spectacular industry.

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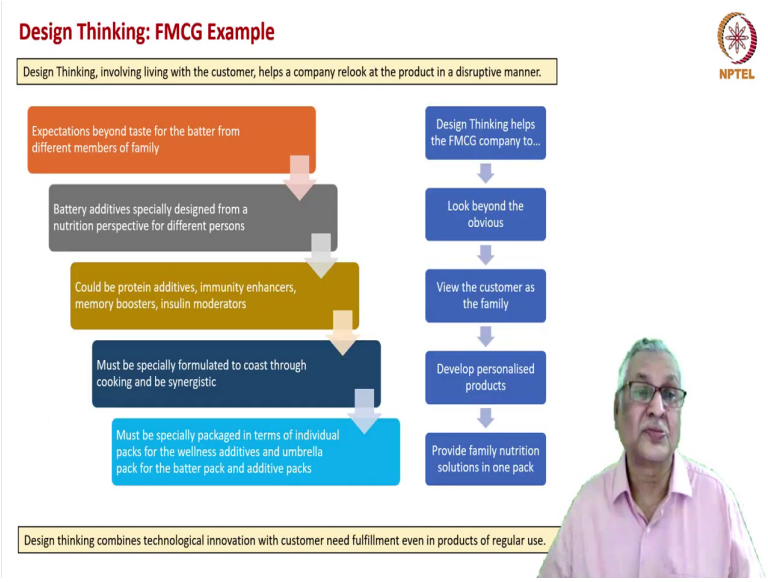

Let us look at the FMCG example. It helps the company and the consumer, relook at the product in a disruptive manner. When you look at an FMC product particularly the food product, you can have expectations beyond taste for the food product from different members of the family.

The family members may also require additives which are specially designed from a nutrition perspective for different persons. These additives could be protein additives, immunity enhancers, memory boosters, insulin moderators etcetera. They also must be specially formulated to coast through cooking and be synergistic for different kinds of cooking environments.

And, they must be specially packaged in terms of individual packs for the wellness additives and umbrella pack for the batter pack and additive packs. So far we have considered many

examples of market research. Now, let us start looking at design thinking and we will go through one product after the other product.

I will also try to explain why design thinking is superior to market research in terms of strategic thinking. I have pointed out how market research helps us improve the products, but fundamentally the product innovation, manufacturing delivery and supply chain cycle does not get changed better calibration happens, but it does not substitute one product with a disruptive product.

But, when we look at the examples of design thinking which I am able to give here, you will find the difference the design thinking can make to development of products or services at a fundamental level. That way design thinking simulates strategic thinking and provide strategic support in a better manner.

So, in this example of FMCG product, the company representatives living with the customer can help the company relook at the product in a disruptive manner. We will be able to discover the expectations beyond just test for the batter from different members of the family. The battery of additives that are required and specially designed from a nutrition perspective for different persons will be understood.

And, these could be protein additives, immunity enhancers, memory boosters, insulin moderators so on. And, depending upon the customers with whom you are working with and their individual and family health conditions and wellness conditions, you may get different kinds of suggestions and it will also be evident that the batter must be specially formulated to coast through cooking and be synergistic.

And, there would also be expectations of the packaging that must be special in terms of individual packs for the wellness additives and umbrella pack for batter pack and additive packs. That is, what one could say is that I have got 10 requirements of different kind of additives, but it is impossible to make a batter which meets all the 10 individual requirements with additives embedded.

So, you may come up with a solution by which you have the standard batter and then have an additive pack, and the additive pack being of different types can be customized. And, each batter could be termed as a diabetic batter or a batter for children requiring memory boosting or it could be for an immunity enhancement for elders and so on.

So, once you open the batter the additive pack can also be opened and both mixed and then offered. It is a start-up kind of idea that could emerge from the design thinking process. So, design thinking helps the FMCG Company to look beyond the obvious. View the customer as the family.

Develop personalised products, and provide family nutrition solutions in one pack without having the cost such customization would have in the normal research process or in the normal development process. Therefore, design thinking combines technological innovation with customer need fulfilment in a very creative manner.

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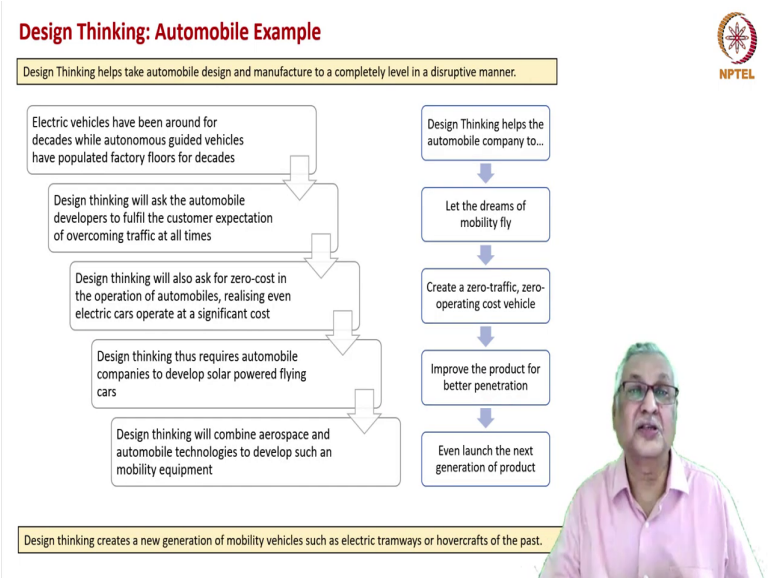

Let us take another design thinking example in the case of the automobile. We saw what market research can do to automobiles in terms of incremental design and manufacturing. Electric vehicles have been around for decades while autonomous guided vehicles have populated factory floors for decades again.

With design thinking, we can look at this in a completely different way. The design thinking will ask the automobile developers to fulfil the customer expectation of overcoming traffic at all times. So, it will also ask for zero-cost in the operation of automobiles realising that even electric cost require significant cost to operate.

Designing thinking also requires automobile companies to develop solar powered flying cars. Design thinking will challenge the company to combine aerospace and automobile

technologies to develop such a mobility equipment. Therefore, design thinking helps the automobile company to let the dreams of mobility fly in a literary as well as figurative sense.

It can help create a zero-traffic, zero-operating cost vehicle. It can improve the product for better penetration and even launch the next generation of product. Design thinking therefore creates a new generation of mobility vehicles such as electric tramways or hovercrafts of the past created in their times. So, that is the enormous quantum jump capability of design thinking.

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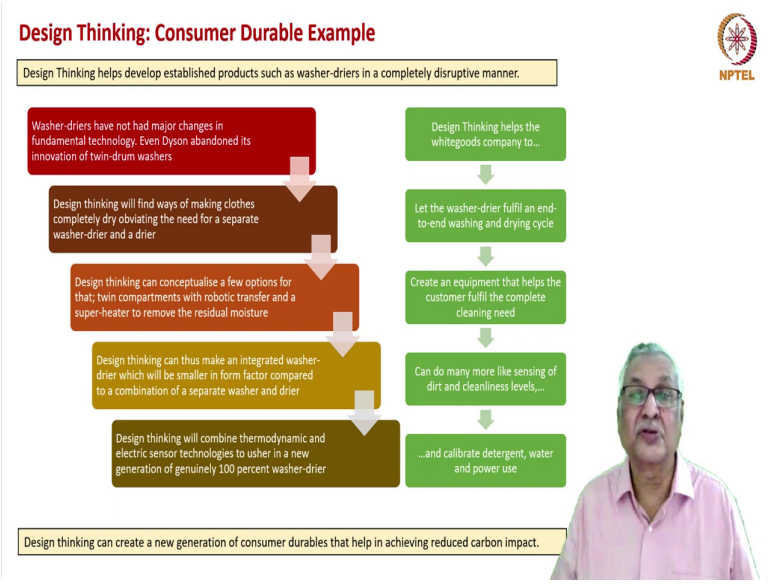

Let us go back to the consumer durable example, the washer drier. We had seen what market research provides for the washer drier. Washer driers have not had major changes in fundamental technology. Even Dyson abandoned its innovation of washers. Design thinking

will find ways of making clothes completely dry obviating the need for a separate washer drier and a drier.

There may be vested interest on the part of consumer durables companies taking the washing drying cycle up to 85 percent dryness and leaving the rest to be done in a drier. Maybe disruptive thinking could break this mold and create new demand vistas for washer driers.

Design thinking can conceptualise a few options for that twin compartments with robotic transfer or a super heater to remove the residual moisture. Design thinking can thus make an integrated washer drier which will be smaller in form factor compared to a combination of a separate washer and drier.

Design thinking will combine thermodynamic and electric sensor technologies to usher in a new generation of genuinely 100 percent washer driers. What happens to the white goods company because of such design thinking? It lets the washer drier fulfil an end-to-end washing and drying cycle.

Creates an equipment that helps the customer fulfil the complete cleaning need can do many more like sensing of dirt and cleanness levels, calibration of the detergent use, use of artificial intelligence leading to better mixing of clothes, warning whether the these kinds of clothes can be combined or not combined.

These are all in the realms of possibility. Finally, calibrate the detergent water and power use for the best safety and integrity of the washing cycles and the washed apparel. Design thinking therefore, can create a new generation of consumer durables that help in achieving reduced carbon footprint.

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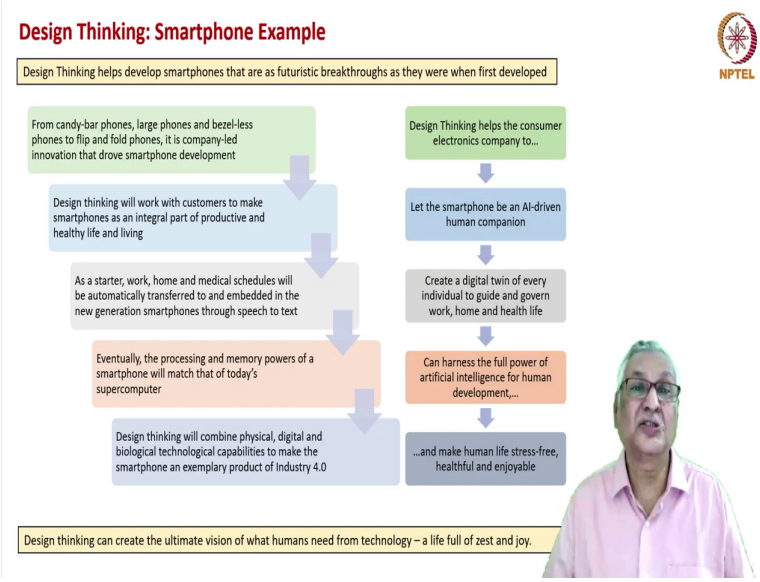

Let us look at the smartphone example again. We said that market research helps us improve the smartphones incrementally, but let us look at how design thinking can help smartphones in terms of futuristic breakthroughs. And, smartphones were indeed futuristic breakthroughs when they were first developed, but later on that flare is lost.

So, from candy-bar phones, large phones and bezel-less phones to flip and fold phones, it is company led innovation that grows smartphone development. But, once you start deploying design thinking, customers will be made to think of smartphones as an integral part of their productive and healthy life and living.

Then they will think of smartphones as a starter work home and medical scheduling device. There could be enormous amount of data from the day to day living that is automatically transferred to an embedded in the new generation smartphone from speech to text methods.

Eventually, the processing and memory powers of the smartphone may match that of today's supercomputer. Design thinking then will merge physical, digital and biological technological capabilities to make the smartphone an exemplary product of industry 4.0. So, compared to market research which gets us incremental smartphone, design thinking helps us or the helps the consumer electronics company to achieve the following.

Let the smartphone be an a driven human companion. Create a digital twin of every individual to guide and govern work, home and health life. Harness the full power of artificial intelligence for human development and finally, make human life stress free helpful and enjoyable.

So, design thinking can make and create the ultimate vision of what humans need from technology – a life love zest and joy. That is what design thinking can do as applied to market research.

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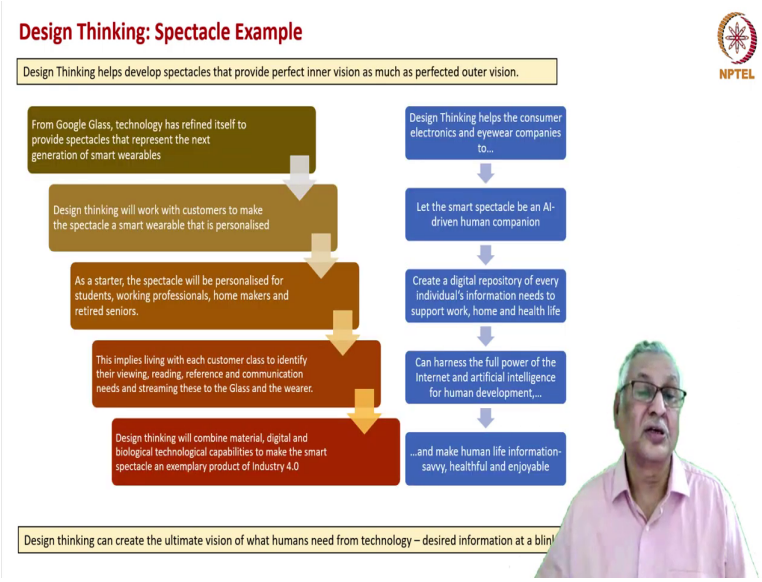

Let us look at the spectacle example. Design thinking can help develop spectacles that provide perfect inner vision as much as perfected outer vision. From Google Glass technology has defined itself to provide spectacles that represent the next generation of smart variables there is no doubt about that, but design thinking will work with customers to make the spectacle a smart variable that is personalised.

As a starter the spectacle will be personalised for students, working professionals, homemakers and retired seniors. The needs are different. The needs of inner vision and outer vision are different. This implies living with each customer class to identify their viewing, reading, reference and communication needs and streaming those to the glass and the wearer.

Design thinking will combine material digital and biological technological capabilities to make the smart spectacle an exemplary product of industry 4.0. So, design thinking in this case helps the consumer electronics and eyewear companies to achieve the following.

Let the smart spectrum will be an AI driven human companion, create a digital repository of every individuals information needs to support work home and health life, but just as the other smartphone would do. Harness the full power of internet and artificial analysis for human development. Again, make life information-savvy, healthful and enjoyable.

Design thinking can create the ultimate vision of what humans need from technology – desired information at a blink.

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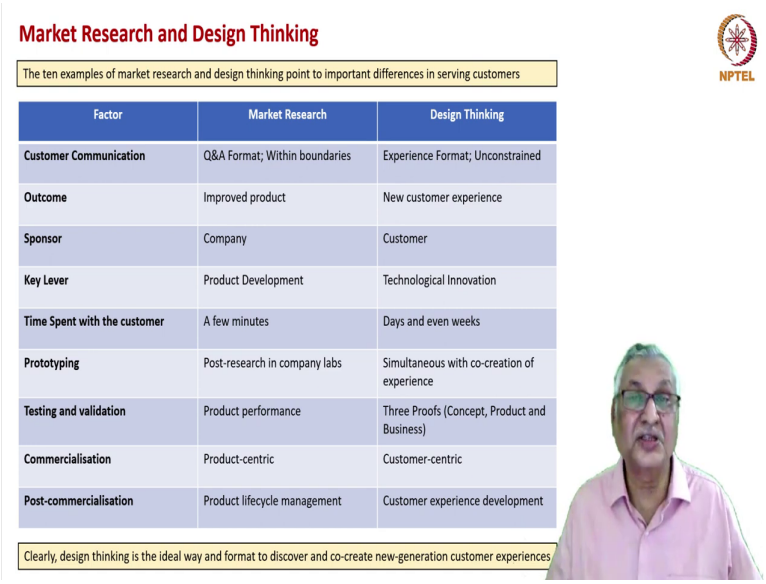

So, when you look at market research and design thinking, these are the important differences which we must keep in mind. As far as customer communication is concerned market research is in Q and A format within boundaries. Design thinking is in the experience format unconstrained.

Outcome for a market research exercise is an improved product; for design thinking – a new customer experience out of even completely different nature of the product and service. Sponsor for market research of the company for design thinking customer is the real sponsor the key lever of market research is product development whereas, for design thing it is technological innovation.

Time spent with the customer is just a few minutes in respect of market research questionnaire and it could be days and even weeks for design thinking laboratory. Prototyping is always done within the company post market research whereas in respect of design thinking it is in-situ. It is simultaneous with co-creation of the experience.

Testing and validation is done elaborately through product performance whereas, in respect of design thinking you have to validate in terms of three proofs. The concept must be proved, the product must be proved and business must be proved. I call these three proofs proof of concept, proof of product and proof of business.

And, commercialisation is product centric irrespective market research and it is customer centric in respect of design thinking. Post commercialisation – it is all about product life cycle management usually with more market research whereas, in respect of design thinking it is all about customer experience development usually with more design thinking exercises.

Clearly, design thinking is the ideal way and format to discover and co-create new generation customer experiences as we go forward towards industry 4.0. So, with this we come to the end of this lecture.

I thank you for your attention, look forward to seeing you again in the next lecture.