Entrepreneurship
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Part 1

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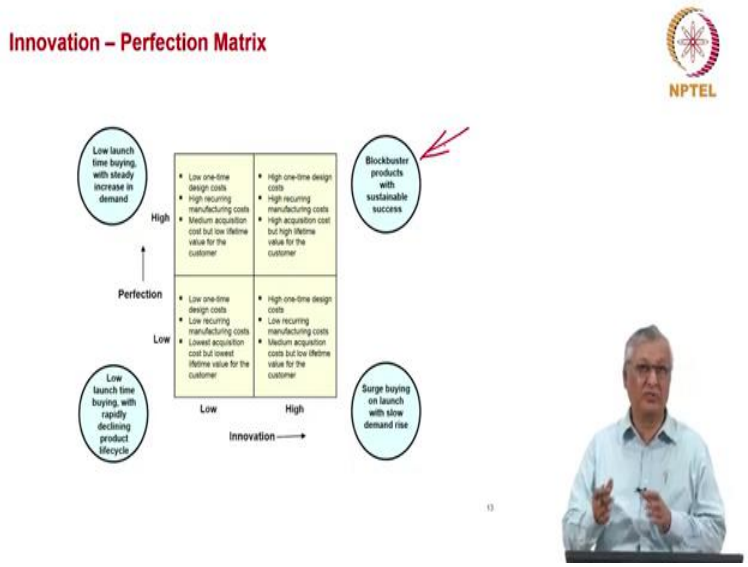

We also saw in the first slide that we are having innovations from 2010 onwards, which are going to drive the new startup space. Now, when we talk about innovation, innovation has two sides of coin, one is innovation, the other is perfection. A highly innovative product and a highly perfect product which is preferred by the marketplace.

So, when we look at the products in terms of these two grids, that is innovation and perfection, we can look at a grid which has low innovation as well as low perfection. Obviously, this will be the cheapest to make and cheapest to buy, but also easily discarded in terms of customer loyalty.

It will have low one time design cost. It will have low recurring manufacturing cost, lowest acquisition cost, but also lowest lifetime value for the customer. So, what would the customer do? There is a low launch time buying and rapidly decline in product lifecycle.

Now, you can look at a variant for this where the innovation level is very high, but the perfection level is not so high. So, when the innovation level is very high, what would happen, the design cost will be high therefore, there will be high one time design cost. Because the perfection level is low, the manufacturing tolerances, the machine sophistication could be a little lower than what is expected of a high perfection product.

Therefore, the recurring cost could be lower. Therefore, the medium acquisition cost would be there, but there will be a lower lifetime value for the customer. So, when this happens, because of the innovation that is ingrained in the product or manifest in the product, there would be high surge buying when this product is launched, but the demand rise will be on a low, slow play.

A variant of that model could be high perfection and low innovation that is reverting to a pen, a pen which has always been in existence has been made to much higher order of perfection. Therefore, there is persistent buying as people start recognizing that this product although known, is providing you greater value of lifetime possession for the customer.

Therefore, you have low one time design costs in this, high recurring manufacturing costs because you are pursuing perfection, medium acquisition cost but again low lifetime value for the customer. So, these are the two variants, one would say that most of the products fall into this kind of surge buying mode or low buying mode but going up with the passage of time.

But when we spoke of the blockbuster products, they are the products which have high innovation and also high perfection. So, they have high one time design costs. They also have high recurring manufacturing costs, but they offer the highest lifetime value for the customer despite the high acquisition cost, and these are the products which we call earlier, these are the blockbuster products with sustainable success.

Now, what does a startup do? Startup could aim to do a blockbuster product straight away. But the startup can also find out ways and means how products can move from low-low quadrant to high-low quadrant or low-high quadrant or eventually to low-high

quadrant. So, the way you analyse the product in terms of the core inert and also the peripheral inert and make sure that you have got the technologies to upgrade those products.

Either in terms of innovation or perfection or both, that is a startup opportunity, which you get. So, this innovation perfection matrix is one kind of platform by which you analyse your opportunities.

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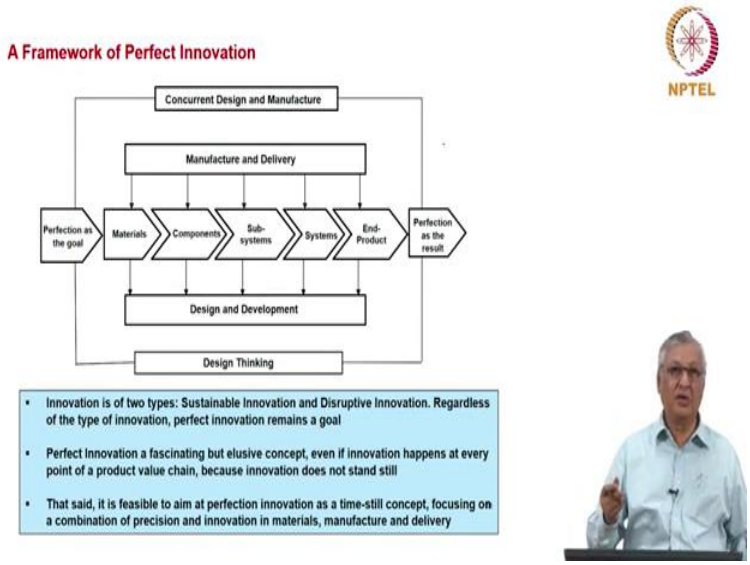

Now, this perfect innovation is something which we need to have as a goal. The blockbuster product we said is a perfectly innovative product. You can also say it is an innovatively perfect product whichever as it is. So, we in this design concept will have perfection as the goal and perfection as the result. But in between the goal and the outcome, we have materials, components, subsystem, systems and end product which are designed and developed, which are manufactured and delivered.

And the whole thing is within the framework, what we considered earlier of design thinking in terms of ideation, empathizing with the customer, and ensuring how all of these internal components develop a product which meet customer requirements to the most satisfying extent.

But, for that to happen, as a value chain, as a regular industrial activity, you also need concurrent design and manufacture. So, you have got a value chain which should be understood in totality, you should have design and development ability, which brings out those kinds of components and the end product and manufacturing and delivery system which provides the product, which happens by adopting two philosophies simultaneously.

One philosophy of design thinking and the other philosophy of concurrent design and manufacture. So, perfect innovation, yes is a very fascinating and elusive concept in a way. But even if innovation happens at every point of a product value chain, it is an elusive concept because innovation does not stand still, when a normal cell phone was invented, it was an innovation, but is no longer innovation.

When you have the smartest featured phone that is considered innovation, a foldable phone is considered the next stage of innovation. So, the innovation as a movement does not stand still therefore, it is an elusive concept, but it is a goal which every startup, every big company should aim at.

So, I would suggest that we should aim at perfect innovation as a time still concept, that is if time were to freeze at this point of time, what is the perfectly innovative product which could, which we could make, and we should combine precision and innovation in materials manufacturing and delivery to produce this kind of product.

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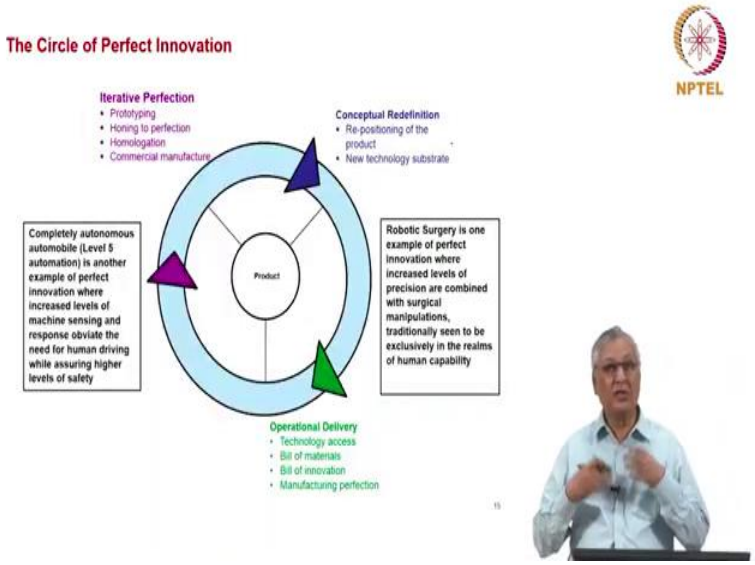

Now, what kinds of perfection we can think of? There are two kinds of perfection, one is the iterative perfection. This we discussed at length when we talked about minimum viable product, how the first product gives a kind of proof of concept. Then we have the next level of product which gives more features.

Normally, we also call in the startup lexicon prototype 1, prototype 2, prototype 3 or level 1 prototype, level 2 prototype, level 3 prototype etc. So, when we do this iterative perfection of a minimum viable product and later on, once the POC is established the ultimate desirable product. We are honing the prototype to perfection. We are also homologating the product to different usage conditions and different regulatory requirements.

We are also developing the product to ensure that we have commercial manufacturing because when you do a prototype, if a jig is malfunctioning, we can adjust the jig manually and then produce the component. However, in commercial manufacture, you cannot afford to do that because it will stop the manufacturing line. Therefore, iterative perfection requires adjustment to ensure that the commercial manufacturer is completely done.

Then we have conceptual redefinition that is market may not be realizing the importance of either perfection or innovation or the combination of perfection and innovation then, we need to do repositioning of the product and ensure that the new technology substrate which comes out of this perfect innovation is understood by the market. That is the other area.

For example, you look at robotic surgery, it is an example of perfect innovation. So, once upon a time, not so long ago people would have thought that it is impossible for a machine to conduct a surgery. But then when you think of a machine being better than the human hand, because there is no shake which is involved in the machine, then you understand that yes, there is a principle in robotic surgery which must be taken to its logical conclusion.

So, when the doctors human judgment is combined with the surgical precision of the robot, you get a perfectly innovative product, and that perfectly innovative product will keep on going to the next lap, next lap of perfection and so on. Todays robot surgery, for example, is different for different kinds of surgeries. A robot surgery for heart is quite different from a robot surgery for thigh.

And the manipulations that are being required for these two types of surgery is completely differ in their characteristic and in their complexities, therefore, it is being customized, but tomorrow you may have a universally applicable robotic surgery equipment. So, that is the way things will go.

Then finally, the operational delivery, having the conceptual repositioning is fine, iterative perfection of either the established product or the new product like robot machine is fine. But then, how do you actually deliver in terms of operations? Through access to the technology to the entire organization, bill of materials, bill of innovation, and manufacturing perfection.

When you look at completely autonomous automobiles, there is level 5 automation, you can again think of that being perfect innovation because you got to be very precise, how you measure the distances, how you measure the traffic conditions, how you pictured the

various objects, whether they are inanimate objects like cars or animate objects or living objects like human beings and other living bodies.

How do we do really capture those things into your system, that there has to be perfection. And there has to be perfection also how this information is processed. And then judgment is made by the driverless car as to how it should conduct itself. So, there is a huge amount of work which goes inside within the design and development of the car to achieve perfect innovation.

So, there are some areas where perfect innovation is not a kind of philosophical goal. It is very much required goal and the world is moving into that direction, where surgery is automated, where driving is automated, where weather prediction is automated, where medical treatment is automated. When that happens, you need to have perfectly innovative products and that is where individual components also have to be perfectly innovative, another big area for startups to come.

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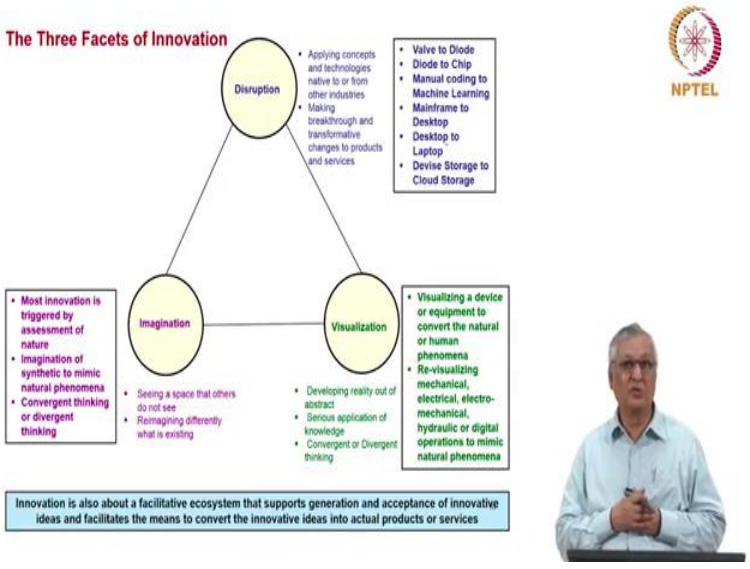

So, when we look at innovation, innovation comes in three ways. One is Imagination. Second is Visualization. Third is Disruption. Why is this important to startups? This is important to start up because startup has two components, one definition of a problem and presentation of a solution that the entire pitch deck of a startup can be just summed

up in one slide which talks about a very innovative solution for a very unknown or very vexatious problem.

So, how do you solve this riddle? And to be able to do that you have to be very imaginative, you have to be able to have visualization skills, and you should also produce products which can disrupt the existing way, so imagination of flying in the air is one type of imagination, visualizing how you would fly looking at the bird and then mimicking its characteristic that is visualization.

And when you apply those concepts from different industries, different product lines to take on this challenge then it leads to disruptive technology. And what was imagined earlier may not be imagined now, but a completely new activity could be imagined. So, we say horses for courses. So, we say that airplane is for flying in the air and car is for running on the road.

But when we say that, we are having traffic log jams gridlocks, therefore we need a flying car then you are setting imagination to a new level. And when you do the imagination to the new level, you have got to visualize how would it be? Obviously, it cannot be exactly the same car with just flies off, it could be a different kind of car, it would be probably a crossover between a drone and an automobile.

Now when you do that, how would you disrupt the industry? You disrupt the industry by borrowing concepts and technologies from allied industries, or non-allied industry. You take concepts from space technology, you take concepts from aeronautics, you take concepts from chemical industry, and then you develop a product which is a flying car.

But the key thing in this is that most of the innovation is triggered by assessment of nature, it is also triggered by how the market evolves and how ready the market is. We have had let us say amphibian vehicles for quite some time, that is vehicles which are on the water and which can also take off and again land back into the water.

So, having done that, a few decades ago, why should flying car come only now, that is because flying cars are being generated as a requirement of a gridlock traffic system. So,

as long as the traffic was moving smoothly, there was no need for a flying car. But when the traffic is gridlock there is all the need for a flying car.

So, the market determines or the ecosystem determines when a new startup idea becomes viable. And we have got several ideas by which disruption can take place from valve to diode in the very old radios, from diode to chip, manual coding to machine learning, mainframe to desktop, desktop to laptop, device storage to cloud storage that is all disruption.

And all of these things brought different technologies from different industries to make this happen.

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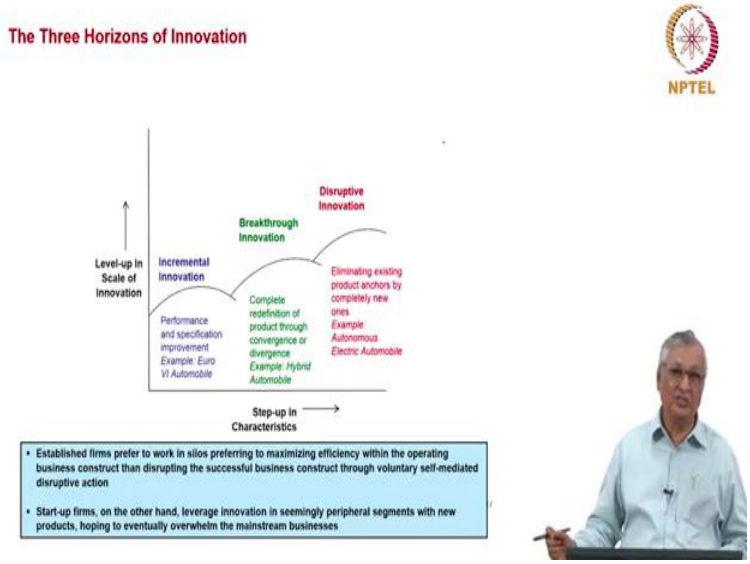

Now, there are three types of horizon which happened. So, the startup has to decide whether I will be in incremental innovation horizon, I should be in the breakthrough innovation horizon or in the disruptive innovation horizon. Now when we look at Euro six automobile, that is an innovation which ensures that the particulate matter is at the lowest level apart from other improvements in NOX and others, is an incremental innovation because the same set of technology you are improving it further, you are not changing the engine configuration.

But definitely you are substituting mechanical fuel injection by electronic fuel injection, you are improving the fuel quality, you are improving the macro mixing system which happens in the engine, therefore, you are achieving incremental innovation.

Then there is a breakthrough innovation, no one thought of putting an electric motor two decades ago in a car and then optimizing between the IC engine as well as the electric motor which Toyota did with a Prius. So, is a breakthrough innovation but a complete disruptive innovation is one which will transform the entire industry. And it eliminates the existing product tankers by completely new ones.

For example, autonomous vehicle which is also electric vehicle. So, when these things happen, whether they happen and therefore, the opportunities for startups or startups provide the wherewithal for the companies to take these innovations forward is the kind of catch 22 situation but ideal ecosystem, both from the end product viewpoint as well as from the component viewpoint, developments occur simultaneously.

So, that there is a good match, when you want to transform the industry. Now, established firms prefer to work in silos. They prefer to maximize efficiency within the operating business construct rather than disrupting the successful businesses with voluntary self-mediated disruptive action.

That is the given fact generally, no industry particularly one which has achieved high level of scale and scope would like to disrupt itself. By saying that I have gone, I have found out a completely new way of doing this service to the society for example, a soap manufacturer who is the number one in manufacture of soaps, would not say, that manufacturing soaps or a soap as a product is no longer the right way you need to use some other system.

You could do that as an adjunct product but not necessarily as a completely substitutive product. So, the Business Economics fight against such kind of disruptive innovation, mediated by the company by itself. That is where the startups come in, because they have no such legacy. They have no such restraints, they have no such constraints, they can come up with their own innovations and ensure that innovation which is there in the

peripheral segments, or brought into the mainstream and eventually overwhelm the overall market.

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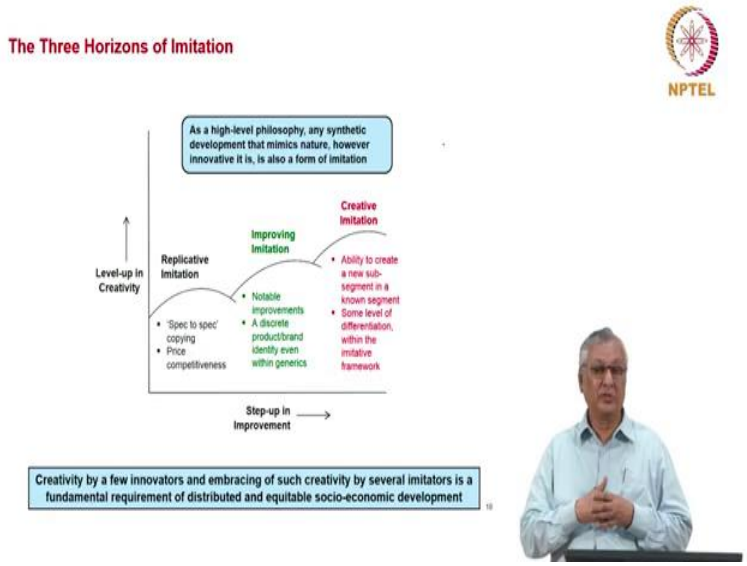

Now, when we talk about innovation, can we forget about imitation? Imitation also exists, startups can work in the imitation space also, I told earlier that imitation occurs. So, when we talk about innovation, we think of imitation as a poor cousin of innovation. But then imitation also is essential for societal growth.

And imitation is also not one where startups can say that I am going to keep off completely because imitation itself has three areas one is a replicative imitation, second is an improving imitation, third is a creative imitation. Replicating imitation is spec to spec copying. Obviously, there is no great technological thought or manufacturing thought involved in that. And it ensures price competitiveness.

But improving imitation is having notable improvements in the product, but not again breakthrough innovations and it creates a new exclusive brand identity that is possible. And the third one is creative innovation, which creates a new sub segment within the known segment. For example, you have got a capsule medicine, but then you create a medicine which can have vegetable capsule, no hint of any non-vegetable ingredient in the capsule.

So, you have imitated it, but you have creatively imitated by putting in a new level of differentiation within the existing framework. So, that is creative imitation. Because the basic product which is inside the capsule is the same, so you have worked on an auxiliary component to take the product to a new segment. So, any high level philosophy when we talk about innovation.

When we concede the fact that it is nothing but mimicking of the nature, we can say that even innovation is imitation of the nature. So, given that kind of philosophical overtone, we should say that imitation is also important, imitation is also worthwhile for startups to enter their field. But to the extent that startups tend to use technology for discovering new solutions for less known problems.

But very important problems, I would say that replicative imitation is left to the ordinary course of entrepreneurship, and improving imitation and creative imitation and come to some extent within the ambit of startup activity.

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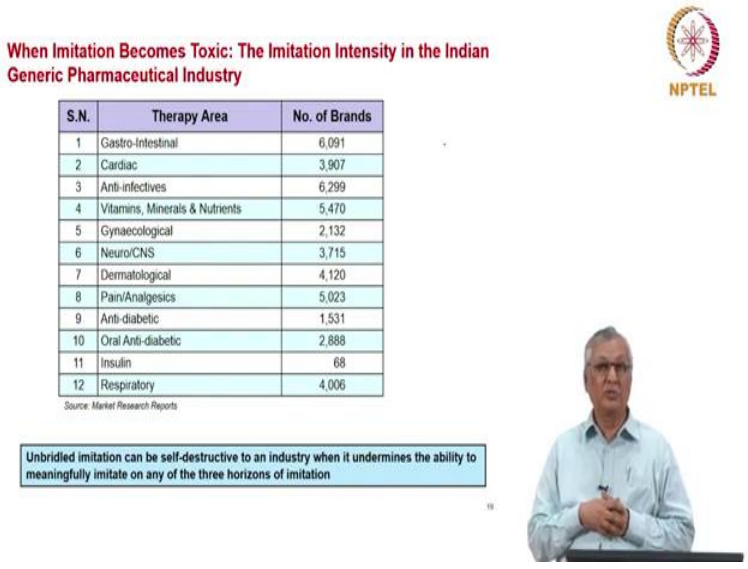

And we have to be also conscious of the fact that when imitation becomes toxic, then the whole structure of the industry becomes faltering. When we look at the Indian pharmaceutical industry, the generic pharmaceutical industry, one would be surprised that

we have got as many as 6000 plus brands in gastro intestinal space, more than 3900 brands in cardiac and 6300 brands in anti-infectives, just for example.

Now, this many brands have to be promoted to the doctors by a legion of medical representatives on ground, and would it be possible to achieve any amount of scale economic, scope economics, except for the top 5 or 10 companies in the pharmaceutical field.

Therefore, unbridled imitation can be self-destructive to an industry, when it undermines the ability to meaningfully imitate on any of the three horizons of imitation, because every brand of this 6000 is exactly the same as the other brand, in terms of the basic characteristics of the medicine, the name of the medicine, and packaging.

So, startups could come up with the way where this imitation toxicity is detoxified. And that could happen in two ways. One way, for example, is a better way of detailing. The other way is to collect data on the efficacy of what seemed to be replicative generic medicine, but actually having an impact in terms of better patient care in certain cases.

Which means that the underlying quality which cannot be found out is being found out by the doctor through the deployment of the medicine for the patient and the feedback from the patient in terms of the improvement. So, here again, there is a lot of data collection, big data and analytics involved, and that that is where the startup has a role to play.

So, again, if it is innovation, there is obviously role for startups. If imitation there is a role for startups, but the roles that are played are completely different. Earlier also we looked at where how startups can improve or enhance digital bio-cell, but the same startup movement can ensure that, that enhance the digital bio-cell levels do not harm the environment beyond a particular point. So, there is some kind of universality in this startup phenomenon.

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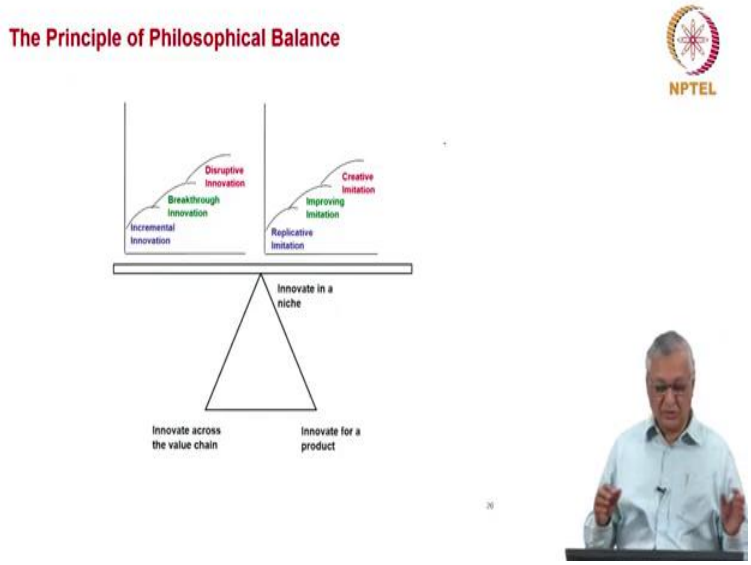

So, if you take the view that the society needs a philosophical balance between innovation and imitation, innovation being incremental, breakthrough and disruptive, imitation being replicative, improving and creative, and when we design a product, should we innovate across the value chain, innovate just for the product, or innovate in a niche.

Now, you have got a huge set of options for you as a startup, to see, where your product or your service can be positioned.

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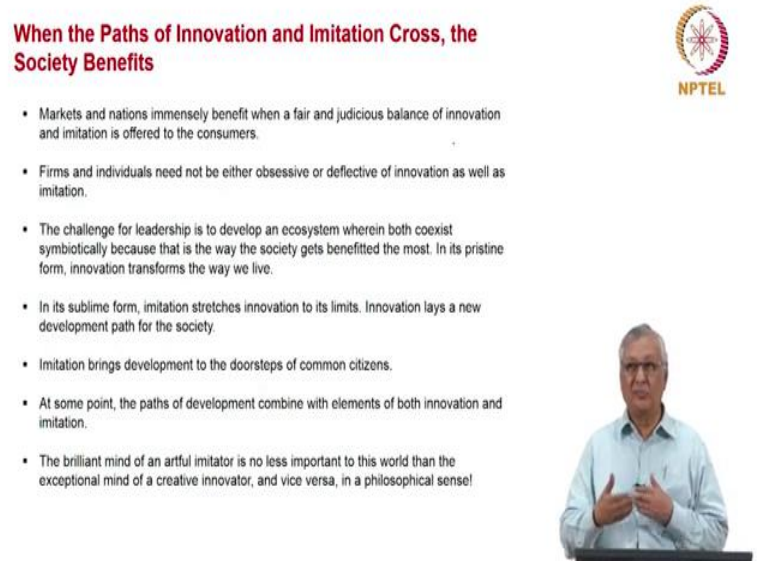

So, the hypothesis is that when the paths of innovation and imitation cross the society benefits, because the markets are also wised with a large bottom and a huge middle, developing middle and small apex.

So, you can say that if you look at a market like India, you have got a US at the top, which is a highly developed market, then you may be having less developed market in the middle and most undeveloped market in the bottom foundation. But everybody needs a good product, a base level of quality is required, a base level of service delivery is required.

And innovation helps you achieve that universally across the product range. But the same innovation helps customize the product for different areas. So, if you look at the fruit beverage and fruit beverage which stays on for 1 month without refrigeration helps the larger population, whereas the fruit beverage which has got the lowest level or no level of preservatives is cold pressed raw.

But can only stay for one day, meets the requirements of the apex. So, certain levels of innovation, certain types of innovation, help develop certain types of products which meets certain market requirements, whereas other types of innovation, help the same product be available for the large population, which can afford lower levels of price only,

but also require the same level of nutrition and the same level of satisfaction of taking a beverage.

And once that is done, particularly in the middle and lower brands, number of imitators come in they try to flood the market with their own products. So, when an innovator develops a market, develops a product line, he opens up the path, then a huge flood of imitators come in, and they expand the market and make the product available to the larger population of society.

So, I would say that the brilliant mind of an artful imitator is no less important to this world than the exceptional mind of a creative innovator, and vice versa in a philosophical sense. Now, the startup could be a good bridge between an artful innovator and a creative imitator, could be a bridge between an artful imitator and creative innovator and a startup which has got low resources.

But has creativity could be an artful imitator to start and a startup which is very well funded, which has got lots of technologies and is willing to take up a huge risk could be a creative innovator and when that happens, then you will find that the society is not satisfied with this just 7,000, 10,000 startups we have but they may need 100,000 startups.

So that is how the startup moment becomes virtuous when it covers every aspect of innovation, imitation, and every segment of the market from the luxurious market to the most common man's market.