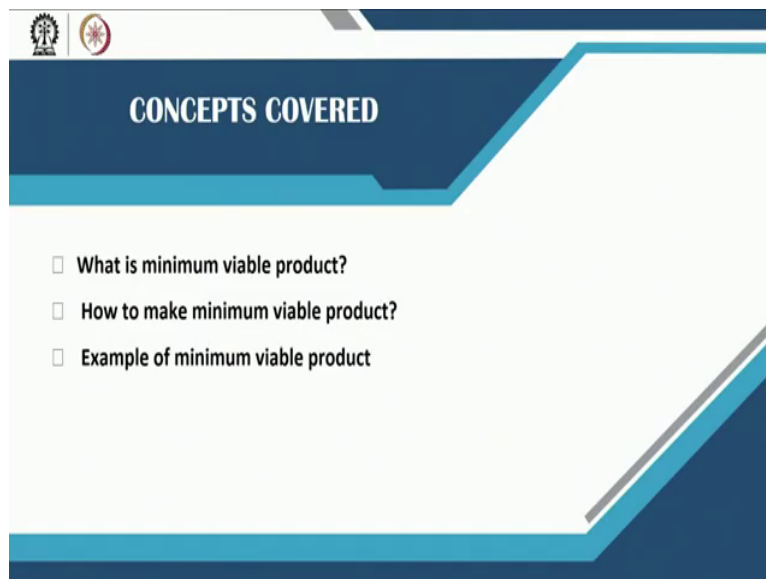


Entrepreneurship Essentials
Prof. Manoj Kumar Mandal
Rajendra Mishra School of Engineering Entrepreneurship
Indian Institute of Technology, Kharagpur

Module - 05
Lecture – 24
Lean Startup – II

Hello and welcome. We shall continue our discussion on the Lean Startup from the previous session. We will be talking about, we will be defining minimum viable product and then we will compare the traditional method of product development with lean product development and then we will end with an example of lean product development or lean startup altogether.

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The slide features a dark blue header with the text "CONCEPTS COVERED" in white. Below the header, there are three bullet points, each preceded by a small square icon. The slide has a modern, geometric design with blue and white color schemes and a small logo in the top left corner.

- What is minimum viable product?
- How to make minimum viable product?
- Example of minimum viable product

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Traditional Process of Product Development

- Epiphany, serendipity, eureka or just a problem.
- Identify product to be developed based on market survey.
- Frequently, the problem is faced by the entrepreneurs. Fanindra Sama of redBus.
- Ideation and idea screening based on technical feasibility and market potential. This phase is also known as Fuzzy Front-End as there is no clarity of the final shape of the product and the market acceptability. Only a few ideas would eventually emerge as a marketable product.

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So, traditional process actually involves either a planned research and development that you have a problem and then you decide different parameters different factors for developing a solution. And then think over maybe you have an epiphany moment or a serendipity or suddenly there is an eureka moment and then you start building that.

You identify product we developed based on market survey. You do market research and then it comes out that market is actually demanding a product of certain kinds, we start building them. Frequently the problem is faced by entrepreneurs like if you are really facing a problem on a daily life, you can actually start building that.

And many many entrepreneurs actually started building product based on the problems that they face like Fanindra Sama of redBus. He was trying to catch a bus to go somewhere and then he realized that there is information asymmetry and there is no information available

with anybody trustable information and there is a need that can create huge convenience for a huge number of people.

So, he started building an app through which one can real time understand whether there is vacant seats available in a particular route or it is not and if they are available, you could book it immediately rather waiting and going to a bus stand or somewhere to make the ticket by the time actually that ticket might have been might be sold. So, a solution came when a company evolved and he became successful entrepreneur.

Ideation and idea screening based on technical feasibility and market potential. This phase is also known as fuzzy front end as there is no clarity of the final shape of the product and the product on the market acceptability. Only a few ideas would eventually emerge as a market marketable product or market will actually buy that product.

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Traditional Process of Product Development ... cont'd.

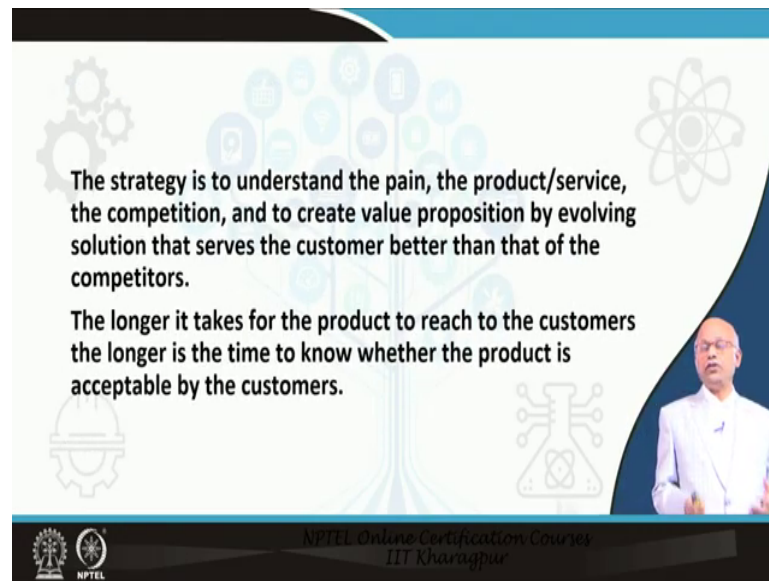
- Design & Develop, Test and refine.
- Check the design for manufacturability.
- Cost & demand analysis, pricing, Go-to-market strategy.
- Create awareness.
- Launch - manufacture, distribute through distributor network or sell online.
- Maintain or improve quality.

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So, initial estate actually is critical for saving initial resources and eventually going to market. So, traditional process involve you design, develop, test, refine and then you go to market to see whether customers are actually buying. So, by that time you have put all the infrastructures in place. Check the design for manufacturability of course, before going to market before commercial production, you need to check for manufacturability. There are many many things which cannot actually be manufactured in a standard setup.

Cost and demand analysis pricing go to market strategy. You see how the cost is you may have may cost plus pricing and then go to market. This is a traditional process not lean process and create awareness. So, advertise or whatever means you would like to lunch manufacture distribute through distribution network and sell or sell online maintain or improve quality that is how a traditional mentality works. This is contrary to lean strategies that is the point of discussion today.

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The slide features a light blue background with various icons: gears, a tree with nodes, an atom, a microscope, and a chemical flask. A speaker in a white shirt is visible in the bottom right corner. The text on the slide is as follows:

The strategy is to understand the pain, the product/service, the competition, and to create value proposition by evolving solution that serves the customer better than that of the competitors.

The longer it takes for the product to reach to the customers the longer is the time to know whether the product is acceptable by the customers.

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The strategy is to understand the pain, the core strategy whether you adopt traditional method or lean strategy the strategy is to understand the pain, the product service, the competition and to create value proposition by evolving solution that serves the customers better than the other competitors.

The longer it takes to produce to reach to the customers, the longer is a time to know whether the product is acceptable by the customer. In the meantime, you spend a lot of money; you spend a lot of resources in the form of manpower in the form of material. So, all everything goes down the drain.

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If it is not acceptable by the customer, the start-up has to start from scratch depending on the feedback. All money, time and talent used so far goes to waste.

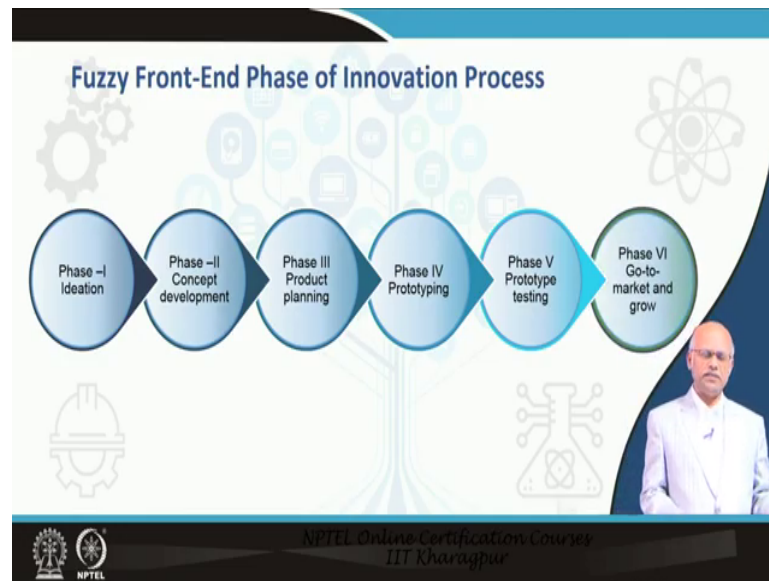
If the startup can get the feedback early one, they can stop moving further and start over, continue with the same product or pivot and develop a new product.

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So, this time is crucial time resources. If it is not acceptable by the customer, the startup has to start from scratch depending on the feedback. If they say that some fine tuning is possible if it reveals that customers will be with some refinement, you can start from there or you have to pivot all money time down the drain.

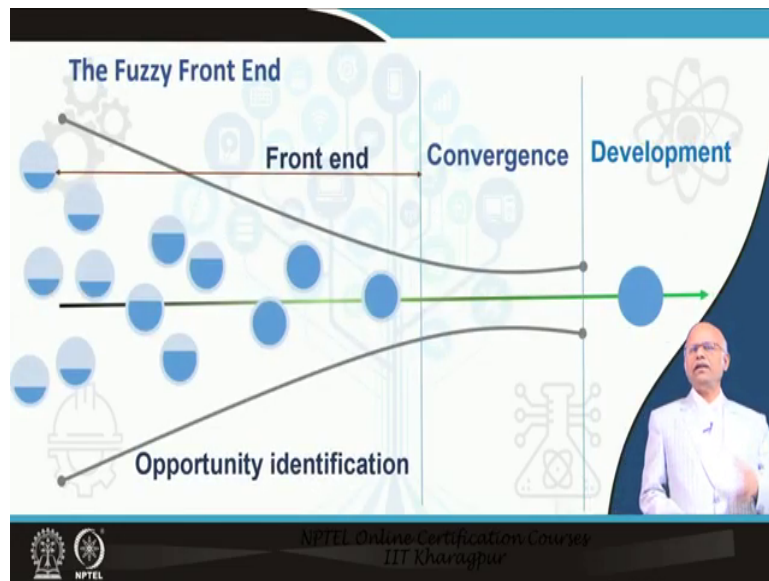
If the startup can get feedback early one, they can stop moving further and start over whether they have to steer the path left or right or pivot taking a u turn can all be decided hourly one rather than spending more money. Continue with the same product or pivot and develop a new product.

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Fuzzy front end, there is no clarity. So, there are ideation phase that you build a concept then product planning, then you prototype testing go to market. It is a standard linear method.

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And there will be many ideas at the beginning you keep on trying and eliminating which are not possible some are possible eventually converge and then start developing the product.

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Product-Market-Fit

- It has been established that the maximum number of failures in startups is because customers do not buy what they offer.
- Cbinsight has documented that 42% of the companies fail because their products or services serve no market need.
- They focused only on building and not on the needs and aspirations of the customers
- It is egregiously brutal to build something that nobody wants. Nobody should do that. Strive for Product-Market-Fit at minimum efforts.

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But then most important thing is product market fit. Customers are going to buy something which they will think that serves their purpose there that ameliorate their pain better than the competing products or it is cheaper with efficacy sufficient efficacy and all that.

So, it serves a purpose and they will buy else they will not buy and it has been established that 42 percent of the startups fail because they failed to produce something that customer would buy or they produce something that customer never buy. They focused only on building.

So, on technology, on cutting edge that we are doing something that nobody else has been doing. So, this there is no reason why customers will not buy they may not even think of the customer at the time of building whereas, it should be just the other way around. It should be customer, customer and customer.

So, customer should be on board; you should take that their opinion, their feedback whether you are whatever you are designing customers actually are interested in that or not. It is egregiously brutal to build something that nobody wants, nobody should do that strive to for product market fit at minimum efforts. So, that you save all your money that you have for doing something better if it is not a product market fit, you can redo with the same resources.

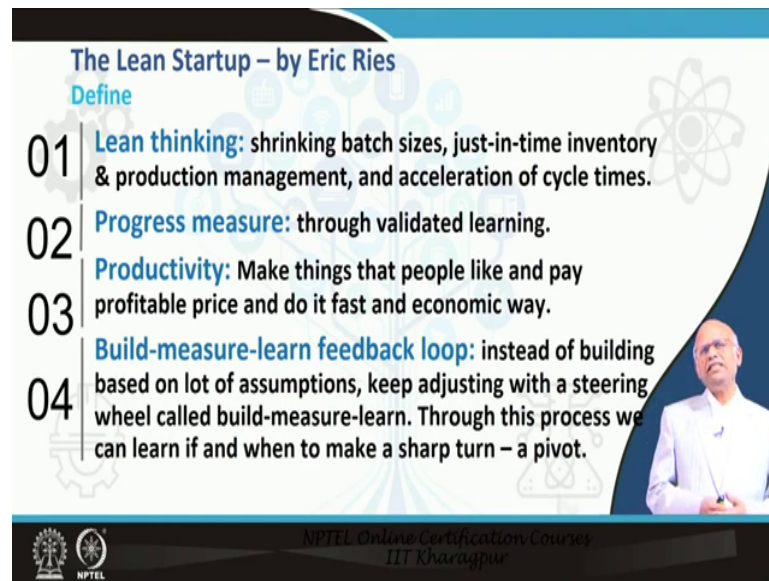
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Now, Eric Ries has written a book called the law The Lean Startup. This is not the first time that the concept of lean came to the marketplace. In fact, this is an extension of lean manufacturing. So, from lean manufacturing and agile development mostly software development, Eric actually has combined the two and proposed lean startup that is a wonderful philosophy, but then lean concept was always there.

In the next session, we will be talking about the genesis of lean in detail. He says how today's entrepreneurs, use continuous innovation to create radically successful business is the topic of the book.

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The Lean Startup – by Eric Ries
Define

- 01 | Lean thinking:** shrinking batch sizes, just-in-time inventory & production management, and acceleration of cycle times.
- 02 | Progress measure:** through validated learning.
- 03 | Productivity:** Make things that people like and pay profitable price and do it fast and economic way.
- 04 | Build-measure-learn feedback loop:** instead of building based on lot of assumptions, keep adjusting with a steering wheel called build-measure-learn. Through this process we can learn if and when to make a sharp turn – a pivot.

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So, the lean startup lean thinking first of all. So, you think in terms of batch sizes just in time inventory and production management and acceleration of cycle time. I will just explain only one say, inventory management. Suppose you are maintaining an inventory of say a 100 rupees or say 100 thousand rupees or 100 lakh rupees. Let us talk about 100 without the unit. Now suppose 100 rupees worth of inventory is 1 month inventory. So, you are maintaining 1 month's requirement of inventory that cost to 100.

Now, suppose bank interest rate is 15 percent. So, you even though it is a monthly inventory every month you are maintaining the same inventory. So, your annual interest towards

inventory will be 15 percent of 100 which is 15. Now suppose you manage the inventory better so now, suppose you manage with inventory of only 30 rather than 100 in a month. So, your annual inventory total is only 30 rather than 100. So, you will pay interest only up to 4.5 or say 5 rather than 15.

So, just by cutting down your inventory from 100 to 30, you are saving 10 out of 15 which is saving some almost like say 66 percent of your interest cost. So, likewise you have to think in lean philosophy. So, that everywhere you can cut; similarly you can cut and then you can save lot of money.

Measure the progress through validated learning whatever you are doing, you get customer feedback early one. So, that you have a fair idea. So, you are a your more learn it person because you have the data that customers do not like this features, they like more of that features those features.

So, eventually you through this learning, you can come back and refine the product. So, before you go to the next round; if you have this knowledge with you, build a better product. So, in the next round customers will have less complain and more acceptable more acceptability.

Productivity: so, make things that people like and pay profitable price and do it as quickly as possible. So, you have you are your productivity is up meaning that you your turnover is up, you complete your product development in a shorter time. So, you save money and resources.

Build measure learn feedback loop. The core of Eric Ries lean startup book is the cycle the loop feedback loop build you based on ideation, you build something, then you take it to the customer, you measure the level of their satisfaction or dissatisfaction. Use that learning to make newer ideas build again. So, that whole loop completes as long as you are not making sufficient progress, but then progress should be made quickly. And that is what is about lean.

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The slide features a white background with a blue header and footer. The title 'The Lean Startup – by Eric Ries' is in blue. Below it, the word 'Start' is written in a smaller blue font. Two numbered points are listed: '01 Innovation factory: Use lean startup technique and continuously create disruptive innovations.' and '02 Culture and systems: Empower people to think out of the box without risk and innovate at the speed of the experimentation system.' The slide is decorated with various icons: a gear, a tree with nodes, an atom, a hard hat, and a circuit board. A small inset image of a man in a white shirt is visible in the bottom right corner. The footer contains the NPTEL logo and the text 'NPTEL Online Certification Courses IIT Kharagpur'.

Eric says startup should create disruptive innovation continuously only, then they will have natural competitive advantage otherwise, they will have to struggle. But if you can disrupt the present state of technology state of business with new business model innovation, then chances of success are much greater.

Empower people to think out of the box like for innovation, you have to have a new culture new system. You have to empower your people to think that they can they are free to think out of the box and they have less risk in adopting their thought process and executing that. If they think that if I think something difficult and then I fail to do that my job is at stake, they will not think out of the box they will not even think and they are even if the thing, they will not try.

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The Lean Startup – by Eric Ries

- Learn
- Experiment with two hypothesis
 - ❖ Value hypothesis
 - ❖ Growth hypothesis
- Leap-of-faith assumptions
- Steer
 - ❖ Minimizing the total time
 - ❖ Minimum Viable Product
 - ❖ Learning milestones

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So, that culture has to be there in the organization that think out of the box and do not worry about risk of thinking. So, learn experiment with lean hypothesis actually lean philosophy is based on two hypothesis or say a startup in general based on two hypothesis before you start. One is value hypothesis, another is growth hypothesis.

Based on these two hypothesis actually you build, you start building a product. So, before you build the product to make two hypothesis; one is value hypothesis; that means, you through this product or whatever product you have in mind that will create sufficient value for your target audience. Meaning that will give them more value for their money compared to the competitor. So, they will buy your product.

Growth hypothesis says that there will be sufficient customer and they will come repeatedly to buy our product and we will grow. But then the whole thing only if it is disruptive if a

product is disruptive, then there will be occasions when there has to be a leap of faith assumptions. Leap of faith and hypothesis are slightly different. Hypothesis is based on some available data meaning that some people have done something, but it is yet to be proven.

So, you make another hypothesis gather data and test your hypothesis. Whereas leap of faith is done based on something non-existent. Meaning that you feel that something will happen though you have no data to back you up. So, you make that assumption and move forward to see if it is successful. You go with a positive mindset that it will definitely be successful because your gut feel says that and then the market will actually tell you whether they really it really is going to manifest.

One example that is frequently talked about in this particular context is that of iPod. When Apple came out with the iPod, it was a disruption of existing business model. Existing business model as part of existing business model where this product was introduced, there were existing products like portable music system is already there in the marketplace which is iPod and which was there is Walkman.

And there are many other products, but then they used to use a cassette or a CD player CD. So, there are two components; one is the machine another is the container of the media of the music whereas, there was no system of music download.

So, Apple made that leap of faith assumptions that people will download music by making payment and when they came up with iTunes store and iPod, people actually started buying iPod and they have started paying to download iTunes and it was a successful business that turnover went up from 10 billion dollar to 50 billion dollar. So, this is a huge success because most people think that because Apple actually disrupted the business model by which it particularly it gave lot of convenience to the customer.

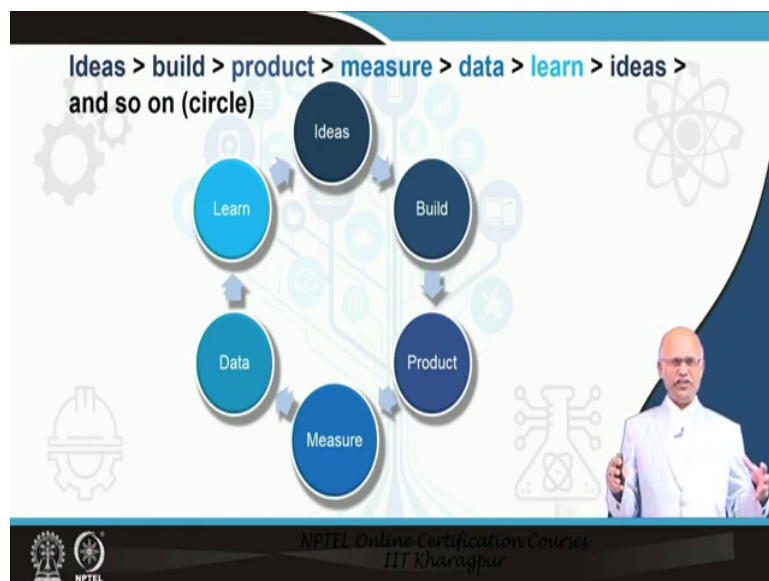
So, it is just not just disrupting. You can disrupt anything negatively, positively, drastically, aggressively, but then it has to give a lot of convenience to the customer lot of benefit to the customer. What it gave is customer could easily conveniently download the music without really going to a store and picking up choosing or most of the times some particular number

was not available. So, this is lot of inconvenience. In iTunes, you could search and immediately get it with too much of convenience. So, that is how it becomes successful.

A core part of Eric's lean startup is steer. So, there are will using the will you steer either left or right or for front or back. So, if you are making a minimum viable prototype meaning minimum viable product meaning a product that has minimum that has some essential features that clearly differentiates your product from the competitor that of the competitors.

And it helps customers to understand the superior value proposition of your product compared to the competitors and they can make informed decision whether they should buy your product or their product. So, it can be done with minimum times through validated learning. So, learning is a milestone in this steering process.

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This is the steering. So, idea build then build the product, then measure, then collect data, learn and restart.

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It is very important statement. In fact, it is part of the title of the book we must always ask. What if the user does not care about the design in the same way that we do, it is very important. Why 42 percent of the companies are dying because they are not asking them this question.

Whether whatever they think about the product and they think that customer like should like this product and buy, do the customer also think that way-this question they do not ask. If they would have asked this question, they would have not built the product the way they built

or the product person at the build. They would have done something different and they would have been successful.

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The Lean Startup – by Eric Ries

- Pivot and Preserve
- Pivot – course correction based on learning. Pivot early if you have to. Vanity metrics prevent pivoting.
- Preserve resources
- Charge early

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Pivot or persevere: pivot means you come back, persevere oh preserve persevere means if you do not preserve, do not pivot then you move forward with the same technology meaning that customers have already accepted your product. So, you persevere here in the same direction build more and more get more and more validated learning.

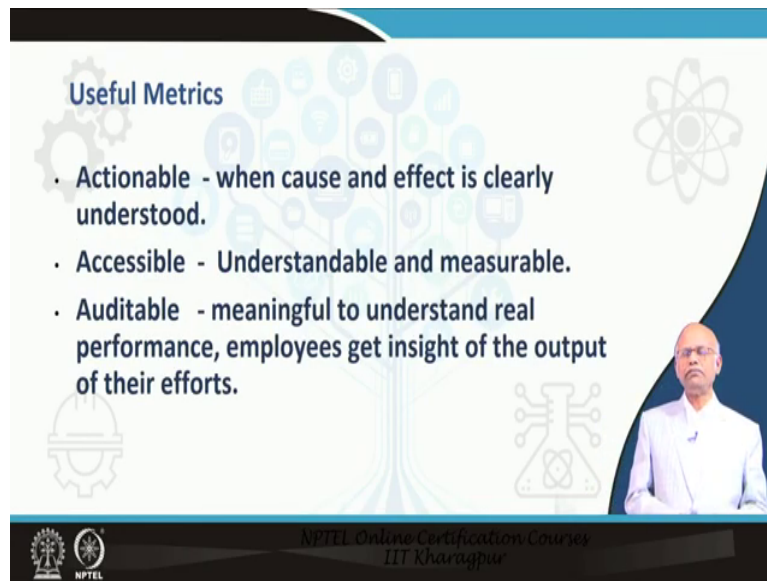
Pivot and preserve means you preserve whatever information you get and then do the loop all over again meaning you come back with the same come back with validated learning. Pivot helps you to make course correction and it helps you to avoid vanity metrics. We discussed during market research. Vanity metrics are those metrics which look very important or appears to be important or appears to be highly valuable, but they are actually not valuable.

Like footfalls in a mall may be a metric that people will be happy that there are say footfalls are increasing people, some management might think that this is a wonderful thing so many people are coming. But maybe they people are coming and just doing window shopping and not really buying, it does not translate into sells that is not that is then it is vanity metrics. But suppose you talk in terms of sales that sales are going up, this is real metric. So, lean startup actually helps us to not really becoming satisfied with vanity metrics.

Suppose we develop something that many customer says that wow this is good, but they do not say that they will buy just because they say that this is good we build that. This is vanity metrics. But suppose they are ready to pay they say that yes I need this product and if the product is in the marketplace, I am going to buy it. This is the real metric that we should be chasing. So, preserve your resources; preserve your resources through valid through validated learning. So, you do not move forward and waste your money.

Charge early: so, some of your minimum viable product can be sold to somebody who is desperately interested he is under massive pain and he finds that your product actually alleviate his pain. So, he will be ready to buy and in case he is ready to buy that is a real validation. Somebody bringing out wallet and may willing to make payment is the real validation otherwise it may be a biased validation.

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Useful Metrics

- **Actionable** - when cause and effect is clearly understood.
- **Accessible** - Understandable and measurable.
- **Auditable** - meaningful to understand real performance, employees get insight of the output of their efforts.

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Metric that you should look for is actionable, accessible and auditable. Actionable meaning that should be meaningful and useful depending on the metric, you should be able to take some corrective actions and then that should give visible positive output.

Accessible information should be accessible by everybody so that they can take their own corrective measures. It should be understood it should be in an understandable format lot of data with no inferences is not going to help. So, there should be some model to really bring out the information out of the data useful information and it should be measurable.

Meaning that whether we are really progressing or we are not progressing and who is accountable who is not which team is doing better which team is doing worse all this should metric should tell us.

Auditable it should be meaningful to understand real performance whether the company is really doing good, product development effort is going well in the right direction, who all are doing good. So, that you can reward or censure accordingly.

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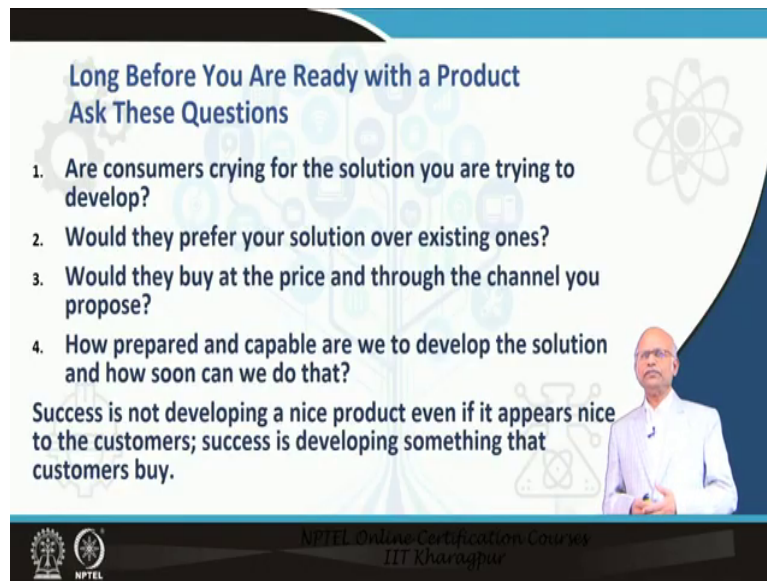
• The Lean Startup process is a way to test your hypothesis continuously, to adapt and adjust before it's too late.

• It is a scientific approach to creating and managing successful startups in an age when companies need to innovate too rapidly.

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So, it should be metric should be meaningful, otherwise we should not gather that metric not waste money on that money resources. Lean process is a way to test your hypothesis continuously to adapt and adjust before it is too late.

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The slide features a white background with a blue header and footer. The main text is in blue and black. A speaker, a man in a white shirt, is overlaid on the right side of the slide. The slide content includes a title, a list of four questions, a concluding statement, and logos for NPTEL and IIT Kharagpur.

**Long Before You Are Ready with a Product
Ask These Questions**

1. Are consumers crying for the solution you are trying to develop?
2. Would they prefer your solution over existing ones?
3. Would they buy at the price and through the channel you propose?
4. How prepared and capable are we to develop the solution and how soon can we do that?

Success is not developing a nice product even if it appears nice to the customers; success is developing something that customers buy.

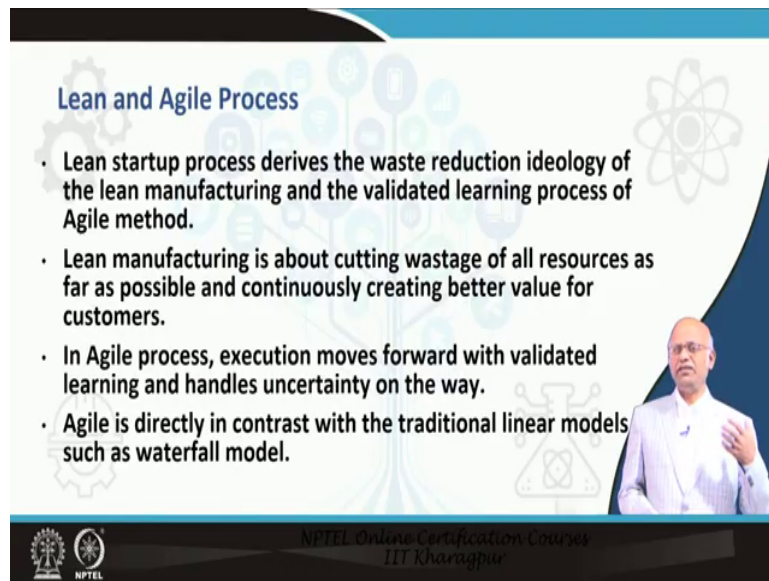
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You should ask this question much before you go to market. Are consumers crying for a solution that you are trying to develop? Would they prefer your solution over competitors solution? Would they buy at the price that you are offering the product? If not, then what is the point?

You develop something that may be cutting edge, but then if customers are not willing to pay like this satellite company who put 66 satellites around the world, but then eventually customers who are not willing to pay. So, we should be care we should be asking that question at the or before we make commitment to make investment. How prepared and capable are we to develop a solution that is going to be liked by customer and we should be able to do that soon enough. So, that we preserve our resources.

Success is not developing a nice product even if it appears nice to the; nice to the customer, success is developing something that customer is right ready to buy paying money profitable money.

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Lean and Agile Process

- Lean startup process derives the waste reduction ideology of the lean manufacturing and the validated learning process of Agile method.
- Lean manufacturing is about cutting wastage of all resources as far as possible and continuously creating better value for customers.
- In Agile process, execution moves forward with validated learning and handles uncertainty on the way.
- Agile is directly in contrast with the traditional linear models such as waterfall model.

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Lean and agile actually lean startup is a combination of lean philosophy and agile process philosophy. Lean is based on saving the wastage or avoiding the wastage. Anything that you waste or anything that you do not consider as waste, but customers do not bother about it that is waste. So, avoid doing that.

Suppose you have say 20 features on your product and you watch customer using the product and see which of the features the customers are using. Then you point out to the customer that they are not using a particular feature that are there.

Now see whether they are really interested in that or they say that we do not care about it, then eliminate that because every feature cost some money even if it is one paisa, it is money. So, if you can avoid some feature and there is no effect on the customer, you are not losing a single customer by doing that you should always try to do that; that is what is lean philosophy removing waste eliminating waste.

The agile process on the other hand is a circular process is a process of validated learning meaning that you do not go step by a step to develop a product linearly rather you complete some scale some steps and then bring customer on board or users on board. Let them use it and give you insight whether they would be interested in the product or they want something different. So, and then you can actually decide whether to move forward or take a u turn or right turn or left turn agile is directly in contrast with traditional linear model such as waterfall model.

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Vision - as espoused by Eric

A startup is a human institution designed to create a new product or a service under conditions of extreme uncertainty. Success under such scenarios requires rapid experimentation. – Eric Ries writes in his book “The Lean Startup”

The stepping stone is the Minimum Viable Product (MVP).

Minimum + Viable
Product that help users discover and evaluate the value proposition

Eric Ries, defined an MVP as that version of a new product which allows a team to collect the maximum amount of validated learning about customers with the least effort.

MVP

Minimum Viable

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So, lean leans vision as per Eric is a start up is a human institution designed to create a new product or a service under condition of extreme uncertainty. Success under such scenario requires rapid experimentation. So, Eric Ries wrote in his book the lean startup. The stepping stone in is the minimum viable product. Eric Ries says he defined the MVP, Minimum Viable Product as that version of a new product which allows a team to collect the maximum amount of validated learning about customers with the least effort.

So, whatever the customer want wants, you build that the graph. The image shows precisely. You may have 100 types of minimum product, you may have 100 types of viable products, but what minimum product is a viable product meaning what customer will value you should build that. So, it is the superimposition part of the or the two circles where the MVP lies.

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MVP

- A key premise behind the idea of MVP is that you produce a product with essential features, say a landing page with minimum features or a product with no aesthetics, that your customer can use and give you feedback.
- Sometimes, just seeing what people do with on a product is much more reliable than asking people what they would do.

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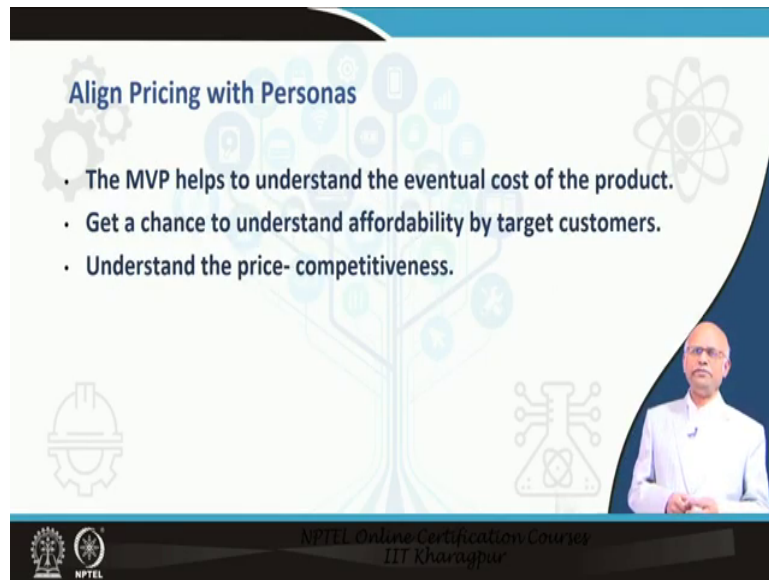
A key premise behind the MVP is that you produce a product with bear essential features say a landing page. Suppose you are thinking of a web page just build a landing page and see where customers are clicking are they are clicking or they are just going away looking at it. If you can identify where they are clicking, you understand that those are the places they are interested in etcetera.

If you are designing a hardware, then a product with no aesthetics just something that that serves the main purpose should be built and then take validation from customer. Sometimes just seeing what customers are doing is better than asking them question is give the product to them.

They will look at it, they will fiddle and then somehow they will click and then see that itself is a good knowledge. You will realize that some of the features they are not interested, some

of the features they are definitely interested. Look at their face, there will be a nod with something and they will not be.

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Align Pricing with Personas

- The MVP helps to understand the eventual cost of the product.
- Get a chance to understand affordability by target customers.
- Understand the price- competitiveness.

The slide features a background with a stylized tree of icons representing various user personas and a presenter in a white shirt on the right. The bottom of the slide includes the NPTEL logo and the text 'NPTEL Online Certification Courses IIT Kharagpur'.

And in the process, you will be able to save lot of cost also in the final product. Suppose they are not interested in something some features, you will be able to eliminate them. Whatever you eliminate eventually that adds to the value for their money. Suppose they are paying 100 rupees for a product, now building that product see the cost of building that product can be reduced say by 5 percent. You can give 5 percent more value to the customer, you can sell it at 95 rupees making the same profit and customers are happier.

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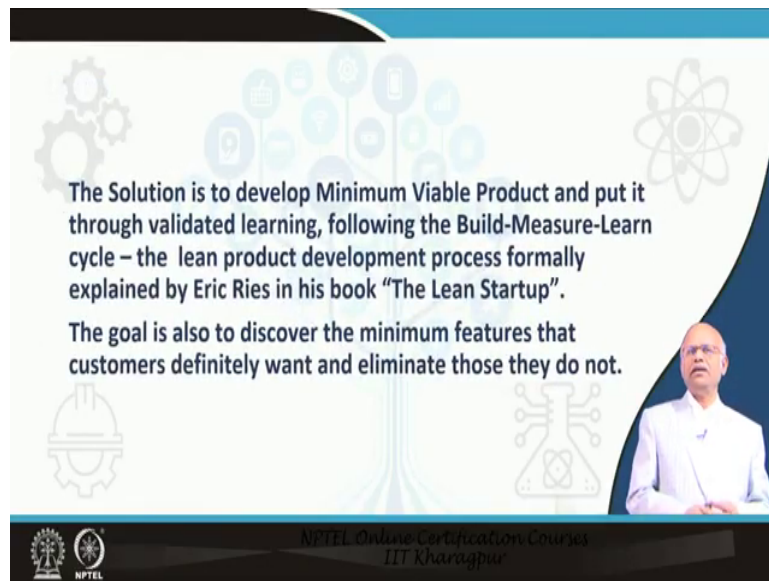
Learn

- Learning through failure is an integral part in a startup journey.
- However, validated learning can accelerate the process of product development and help achieve success with minimum resources.
- The goal is to quickly evolve a marketable product that is an absolute product-market-fit with minimum possible cost.

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Learning through failure is an integral part that is fine. Many people will say that I have learned a lot from my earlier failure, but are you a smarter person, have you got validated, are you a meaning failed forward guy meaning have you learned something that you are going to use it in the future or it is a part of your refinement process? You may always pivot just by failing you fail after a long time, you understand that you have made a lot of mistakes, but rather than doing that you can fail at the early get validated and then move forward that is what is learning in lean startup philosophy.

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The Solution is to develop Minimum Viable Product and put it through validated learning, following the Build-Measure-Learn cycle – the lean product development process formally explained by Eric Ries in his book “The Lean Startup”.

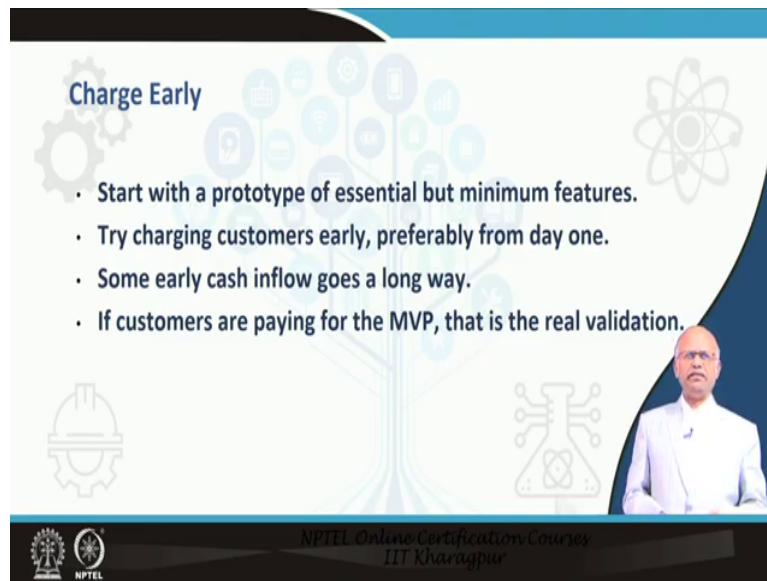
The goal is also to discover the minimum features that customers definitely want and eliminate those they do not.

The slide features a background with various icons: gears, a tree with circular nodes, an atom, a hard hat, and a circuit board. A small inset image of a man in a white shirt is visible on the right side of the slide.

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So, Eric says the solution is to develop minimum viable product and put it through validated learning following the build measure learn cycle.

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Charge Early

- Start with a prototype of essential but minimum features.
- Try charging customers early, preferably from day one.
- Some early cash inflow goes a long way.
- If customers are paying for the MVP, that is the real validation.

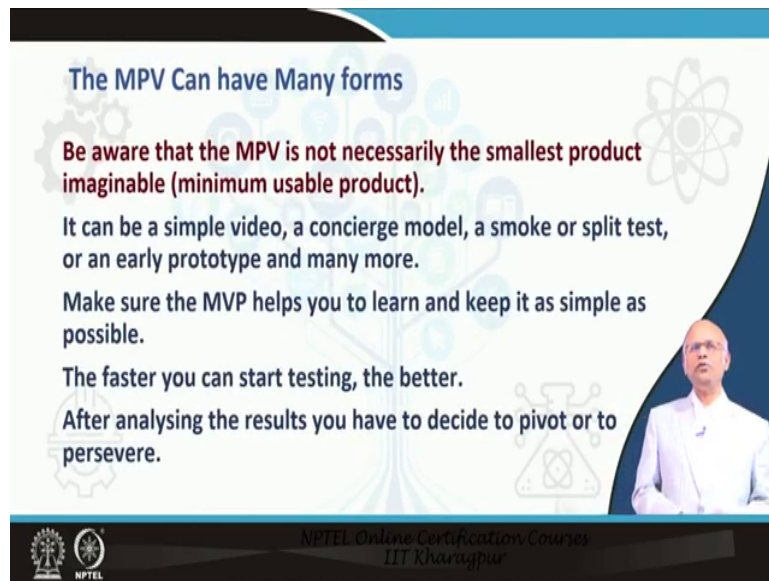
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We will see the cycle; charge early is another very important part. Suppose you build a prototype where the hardware software or anything and it does some essential work for your customer. If anybody has real pain, he or she will demand that product. They will say that ok, give you give me the product; I am going to pay that does many things. Most importantly number one is it tells you that there is real pain that you are trying to sort.

Second it tells you that your product is actually solving that pain otherwise this people will not like to buy paying money. Third is you are getting some money, there is some positive cash flow any time or particularly at the early stage if there is some positive cash flow that go a long way in making your business viable.

Otherwise if you think that we will not charge early and we will charge when customers are absolutely happy that moment may come so late. It may not even come that you will end up a spending all your resources and money and then there will be no money to move forward.

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The MVP Can have Many forms

Be aware that the MVP is not necessarily the smallest product imaginable (minimum usable product).

It can be a simple video, a concierge model, a smoke or split test, or an early prototype and many more.

Make sure the MVP helps you to learn and keep it as simple as possible.

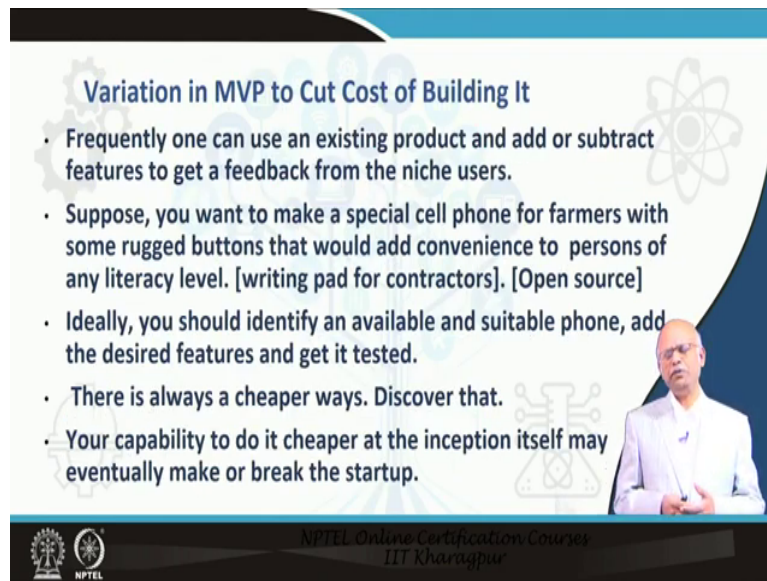
The faster you can start testing, the better.

After analysing the results you have to decide to pivot or to persevere.

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MVP can be of my many form. It can be simple video a concierge model a smoke; smoke for is a simple thing. To do a smoke test or AB test that we discuss. Make sure the MVP help you helps you to learn and keep it as simple as possible. The faster you can start testing the better after analyzing the result, you have to decide to pivot or to or to persevere either pivot back means take u turn or move forward and persevere.

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Variation in MVP to Cut Cost of Building It

- Frequently one can use an existing product and add or subtract features to get a feedback from the niche users.
- Suppose, you want to make a special cell phone for farmers with some rugged buttons that would add convenience to persons of any literacy level. [writing pad for contractors]. [Open source]
- Ideally, you should identify an available and suitable phone, add the desired features and get it tested.
- There is always a cheaper ways. Discover that.
- Your capability to do it cheaper at the inception itself may eventually make or break the startup.

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So, you can have various types meaning depending on how you choose your MVP or decide your MVP will make or break your a startup. Suppose you want to build a say cell phone smartphone for farmers and you want that there will be some big buttons some rugged buttons that is suitable for even his field when he is working in the field he can operate that and understand the weather, the demand supply or something real time. So, if you think that I will build the entire phone and then go to farmers to check whether he likes it is going to require entail huge amount of money maybe several lakhs.

Alternately you can buy a smartphone for maybe 10000 and add all those features and then take it to the farmer may be the total cost will be something like 25-30000 rupees or 50000 rupees. In the process, you save the money; you get to know whether farmers really like it do not like it. So, you can take decision otherwise, this whole money will go down the drain.

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Caution

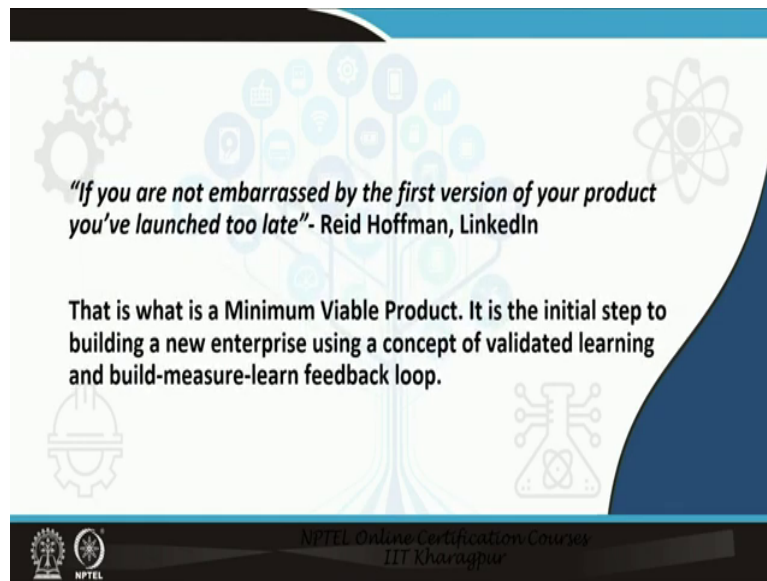
- The term MVP has become a jargon.
- Teams use it without properly understanding the objectives of MVP and end up building just a low-quality semi-finished products that do not elicit the right feedback from users.
- You need to help the users to help you.

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The term MVP has become a jargon and most people think that I am doing something that is an MVP. That is really not MVP, it should be it should have essential features which the users can evaluate and give you useful input useful feedback.

If you just build something, some low quality product that is not MVP that the customer or the users are going to tell you that this is a nasty product and this is not going to be any useful any use to you. You need users to really test the real feature that they are interested in. But then do not worry about the look and feel of that.

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"If you are not embarrassed by the first version of your product you've launched too late"- Reid Hoffman, LinkedIn

That is what is a Minimum Viable Product. It is the initial step to building a new enterprise using a concept of validated learning and build-measure-learn feedback loop.

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Reid Hoffman of linked LinkedIn says “if you are not embarrassed by the first version of your product, you have launched it too late”- meaning that you have waited for the product to emerge as a wonderful looking product only then you went to market for validation. Do not do that, do it early; get it take get it validated much earlier.

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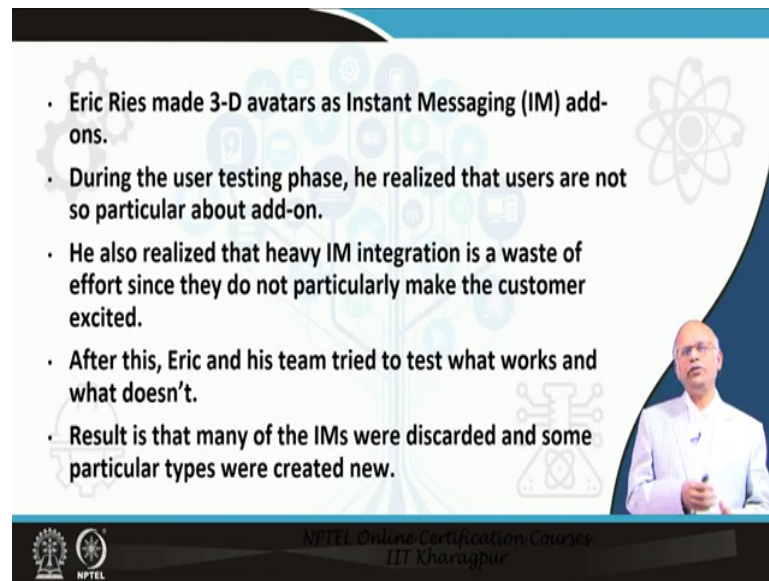
Minimum Viable Product

- Minimum Viable Product or MVP is a development technique (?) wherein a new product is introduced to early adopters with basic features, but **enough for the consumers to test its usefulness**. It may be a step by step process with validation of incremental developments.
- By introducing the basic version to the consumers, firms aim to gauge the fitness of the product to customers' need and make further development strategies depending on the feedback.
- You also on-board some early customers.

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So, in there should be you should think deeply about your MVP and then what should be the format. It should be just enough for the consumer to test its usefulness that is it. So, go early build it go early.

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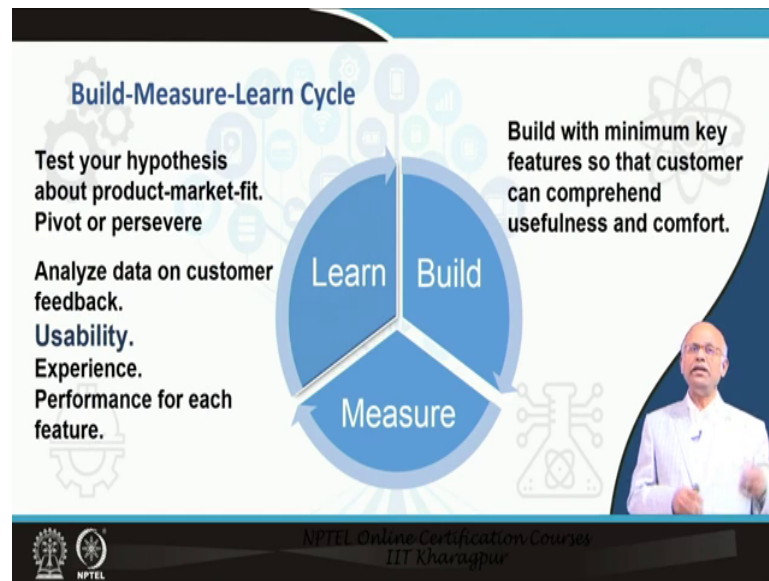
- Eric Ries made 3-D avatars as Instant Messaging (IM) add-ons.
- During the user testing phase, he realized that users are not so particular about add-on.
- He also realized that heavy IM integration is a waste of effort since they do not particularly make the customer excited.
- After this, Eric and his team tried to test what works and what doesn't.
- Result is that many of the IMs were discarded and some particular types were created new.

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This is an example Eric actually was working on building IM for instant message messaging add on some avatars or something, but he was interested in doing more and more complex models, but then he thought is it really meaningful to the customer.

So, he did some survey and customers say who do not care about the complexity or anything. If there are a variety and simplicity that is good enough so, Eric thought why am I wasting so much of time money and all that behind the behind this complex design. So, they started making more variety rather than more complex design and in the process they made money they got this validation done.

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Build-Measure-Learn Cycle

Test your hypothesis about product-market-fit.
Pivot or persevere

Analyze data on customer feedback.
Usability.
Experience.
Performance for each feature.

Build with minimum key features so that customer can comprehend usefulness and comfort.

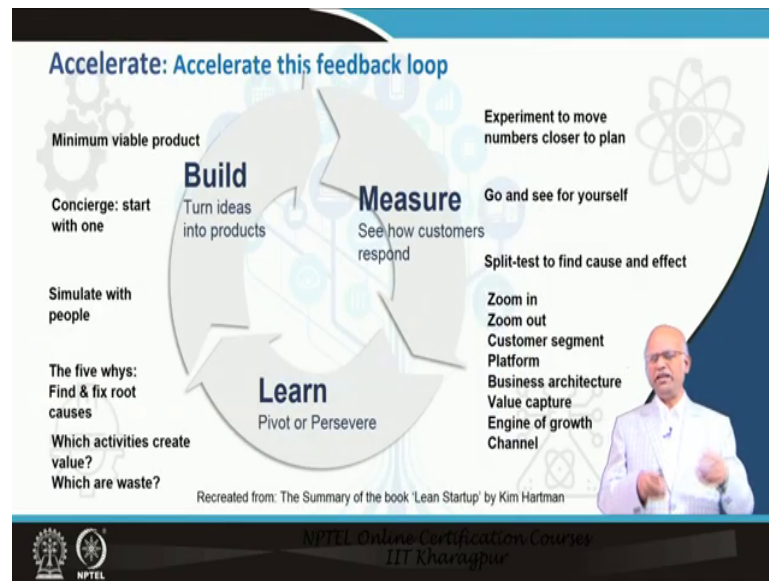
Learn Build Measure

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The slide features a central circular diagram with three segments: 'Learn' at the top, 'Build' on the right, and 'Measure' at the bottom. Arrows indicate a clockwise cycle between these segments. To the left of the diagram, text describes the 'Learn' phase: 'Test your hypothesis about product-market-fit. Pivot or persevere' and 'Analyze data on customer feedback. Usability. Experience. Performance for each feature.' To the right, text describes the 'Build' phase: 'Build with minimum key features so that customer can comprehend usefulness and comfort.' The slide also includes a small inset image of a man in a white shirt on the right side. At the bottom, there are logos for NPTEL and IIT Kharagpur, along with the text 'NPTEL Online Certification Courses IIT Kharagpur'.

Build, measure, learn cycle should follow that very carefully.

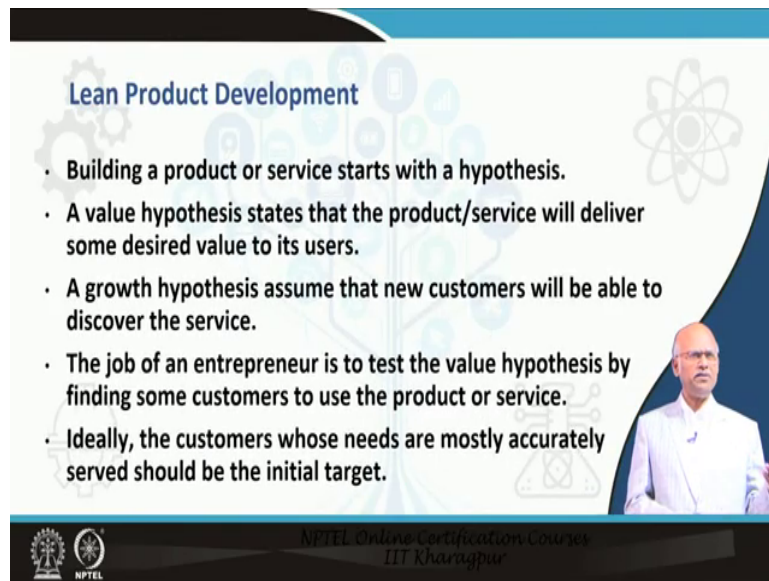
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So, build with minimum key features, then measure the customer satisfaction, learn what actually they are asked there one thing and they are not work one thing and then build it again. So, experiment to move number closer to the plan meaning how many times you will experiment or what kind of features that you are interested in what is your plan you move forward.

Go and see for yourself, it is very important. Bill Gross repeatedly said that you should go out, see the customers, meet them, observe them using something even competitors product see what features they are using more. So, that you can add it you can accentuate that and what they are actually thinking that it is not there you can put incorporate that in the product and then eventually we will get a better product.

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Lean Product Development

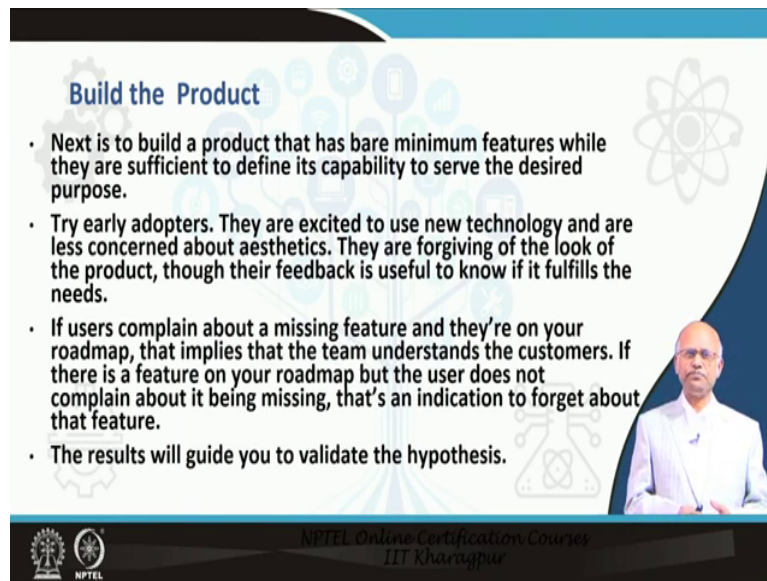
- Building a product or service starts with a hypothesis.
- A value hypothesis states that the product/service will deliver some desired value to its users.
- A growth hypothesis assume that new customers will be able to discover the service.
- The job of an entrepreneur is to test the value hypothesis by finding some customers to use the product or service.
- Ideally, the customers whose needs are mostly accurately served should be the initial target.

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Building a product or service starts with hypothesis value hypothesis. We have already explained that. Value hypothesis is whether we are putting enough value. So, customer will look at it as a superior value proposition. Growth hypothesis will there be sufficient customer and will customer come repeatedly. So, that is your growth hypothesis.

The job of an entrepreneur is to test value hypothesis by finding some customers to use the product ideally customer who needs are mostly accurately served should be the initial target customer with the pain right pain.

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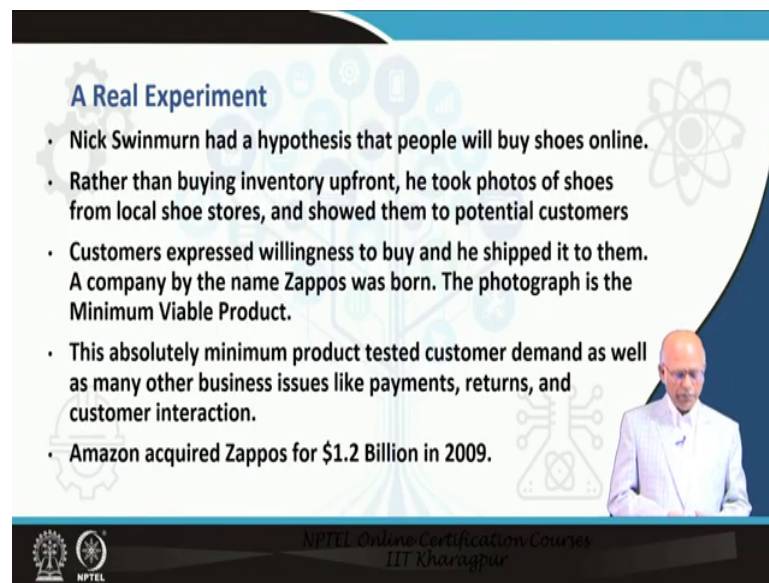
Build the Product

- Next is to build a product that has bare minimum features while they are sufficient to define its capability to serve the desired purpose.
- Try early adopters. They are excited to use new technology and are less concerned about aesthetics. They are forgiving of the look of the product, though their feedback is useful to know if it fulfills the needs.
- If users complain about a missing feature and they're on your roadmap, that implies that the team understands the customers. If there is a feature on your roadmap but the user does not complain about it being missing, that's an indication to forget about that feature.
- The results will guide you to validate the hypothesis.

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And then you build the prototype. The results will guide you to validate your hypothesis.

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A Real Experiment

- Nick Swinmurn had a hypothesis that people will buy shoes online.
- Rather than buying inventory upfront, he took photos of shoes from local shoe stores, and showed them to potential customers
- Customers expressed willingness to buy and he shipped it to them. A company by the name Zappos was born. The photograph is the Minimum Viable Product.
- This absolutely minimum product tested customer demand as well as many other business issues like payments, returns, and customer interaction.
- Amazon acquired Zappos for \$1.2 Billion in 2009.

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Now, I will just conclude by giving this example. Nick Swinmurn of Zappos, he was from a very ordinary family. They did not have a business background. So, lot can be learned from this, I have some reference given there. If you read the whole story will be highly revealing on motivation about starting a startup.

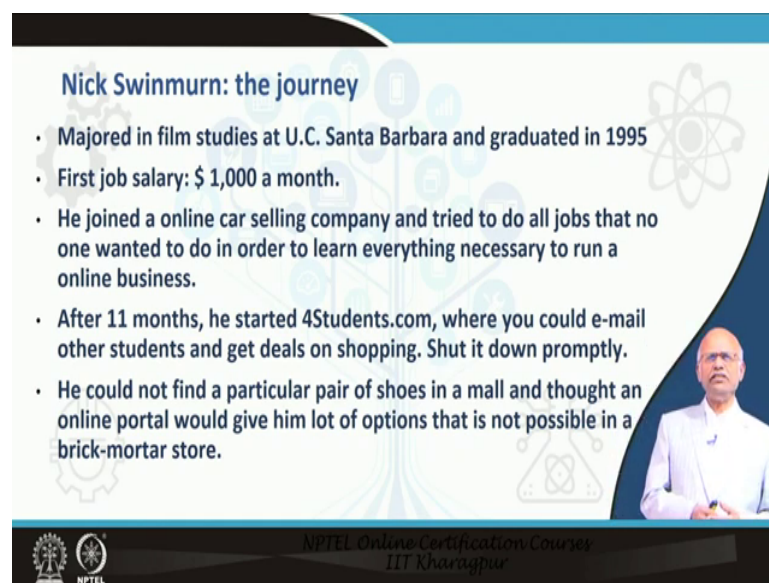
He had a hypothesis that people will buy shoes online just in just a hypothesis rather than buying inventory upfront he took photos of shoes from different malls and exhibitions from local shoe store and exhibition and showed them to potential customers.

Customers expressed willingness to by looking at the photo itself and he shipped it to them multiple pairs actually and then customers who visible pair customer did not like he just got it

back or with his own expenses on his own expenses and then the pairs that they liked, he got the payment later after supplying payment on delivery.

So, eventually a business was born that business was sold to Amazon for 1.2 billion dollar. He started in 1999 and he sold it in 2009. So, in 10 years, he made a value of 1.2 billion dollar.

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Nick Swinmurn: the journey

- Majored in film studies at U.C. Santa Barbara and graduated in 1995
- First job salary: \$ 1,000 a month.
- He joined an online car selling company and tried to do all jobs that no one wanted to do in order to learn everything necessary to run an online business.
- After 11 months, he started 4Students.com, where you could e-mail other students and get deals on shopping. Shut it down promptly.
- He could not find a particular pair of shoes in a mall and thought an online portal would give him a lot of options that is not possible in a brick-mortar store.

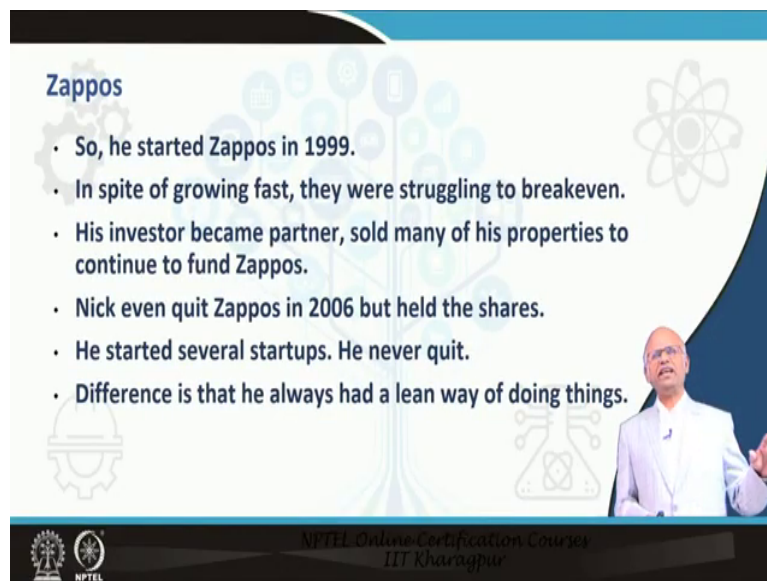
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The journey, he majored from a film studies in U.C. Santa Barbara and graduated in 1995. He joined a job where he got a salary of 1000 dollar a month, paltry salary. He joined an online car selling company and tried to do all odd jobs so, as to learn everything about business just because he wanted to start a business. After 9 11 months of work, he started 4Students dot com. Majority of the university graduates in at least that I know of think in this line.

4Students dot com as a site where you could email other students and get deals on shopping. So, if somebody knows about a deal, he will immediately tell you that there is a deal. He shut it down very promptly, he could not find a particular pair of shoes in a mall and thought an online portal would give him lot of options that is not possible in a brick mortar store because they have a limitation of inventory.

Whereas, in online store, there is no limitation of inventory, you can collect from 1000 stores or different manufacturers also and an upload and people will have a wonderful selection wonderful choice.

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Zappos

- So, he started Zappos in 1999.
- In spite of growing fast, they were struggling to breakeven.
- His investor became partner, sold many of his properties to continue to fund Zappos.
- Nick even quit Zappos in 2006 but held the shares.
- He started several startups. He never quit.
- Difference is that he always had a lean way of doing things.

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So, he thought this can be a business. Most people said this is absurd because nobody wants to buy shoes online, but they want to try the shoe, walk in the shoe and then only they would like to make a decision.

But then he started Zappos against all advice and eventually of course, Zappos was not doing that well even though their turnover increased increase up to 500 million or so, but then at some point of time Nick Swinmurn realize that we are not going anywhere we are not making lot of profit. So, he actually quit Zappos, but he did not quit the percentage share that he held.

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His Advice: [Reproduced from <https://fortune.com/2012/09/05/nick-swinmurn-zappos-silent-founder/>]

- **Respond to the customer's needs.** If a customer called and wanted to buy a certain shoe and we didn't have it, we'd search the web and send him a link to a place where he could get it. We created free shipping as an incentive — both outbound and return — in response to the question "What if it doesn't fit?"
- **Don't let other people put a ceiling on what you do.** When I worked for the San Bernardino Stampede, they told me it'd take years to work my way up through the minor leagues before getting hired for the majors. I ignored them, applied anyway, and immediately got hired with the San Diego Padres.
- **Don't have a big ego.** At Zappos everyone saw themselves as equal, all working for the same goals. I called myself CEO only because I gave myself the title. You've got to relate to everyone because it's a team effort.

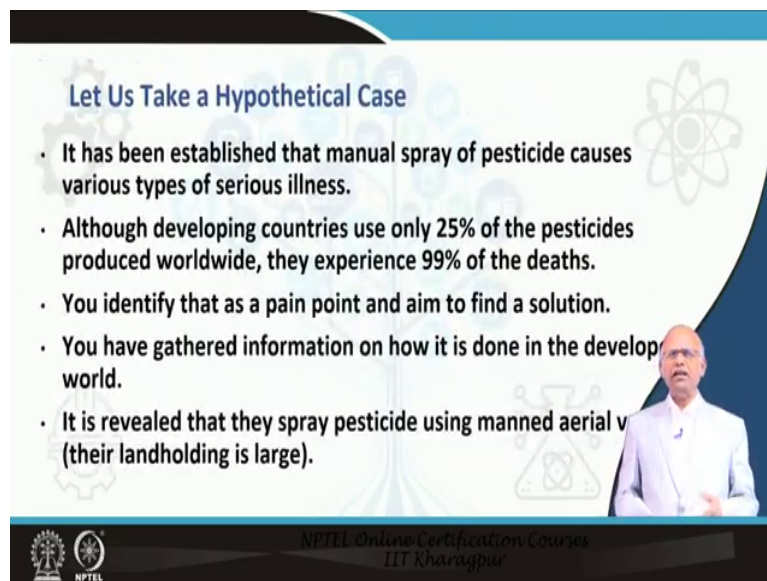
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He started several other startups, he never quit meaning he was always in business. Difference is that he always had a lean way of doing things and eventually he made his own money because he was holding the shares in Zappos and even when it was sold, he got his share.

He is advising, it is very important respond to the customers need and look what he is to do. Even if a customer would not receive not get whatever he or she was looking at his site, Swinmurn would be contacting the customer after getting the information from other sites. He does not earn anything, but he wanted to serve the customer best so, that the same customer may come again and again.

So, even if he did not have the stock, he gathered it from some other store gather only the information. Do not let other people put a ceiling on what you do. Many people suggested Nick that do not start a online shoe shopping shoe selling business if you are not going to buy, but he did that and he was successful. So, do not listen to people; do not have a big ego; ego actually kills everything.

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Let Us Take a Hypothetical Case

- It has been established that manual spray of pesticide causes various types of serious illness.
- Although developing countries use only 25% of the pesticides produced worldwide, they experience 99% of the deaths.
- You identify that as a pain point and aim to find a solution.
- You have gathered information on how it is done in the developed world.
- It is revealed that they spray pesticide using manned aerial vehicles (their landholding is large).

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Let us take another hypothetical case. Say suppose you just put yourself in this whole scheme of things, you should be aware that developing country use only 25 percent of the pesticide whereas, Asian countries and emerging countries use 99 percent of the pesticides.

But then sorry developing country uses only 25percent pesticide and developed country use 75 percent of the pesticide. Whereas, 99 percent death happened because of pesticide in developing countries; only 1 percent death happens in developed countries for pesticide poison.

So, this is a skewed kind of statistics why so, because in developed country; they use drone for pesticide dispensing whereas, in our country people use manual tools for pesticide spraying. So, suppose you think that let us think of starting a business as to how we can help our farmers and avoid this kind of untimely death. So, you think that the drone is a new technology, let us use drone for doing this.

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Drone-Based Pesticide Spray - DBPS

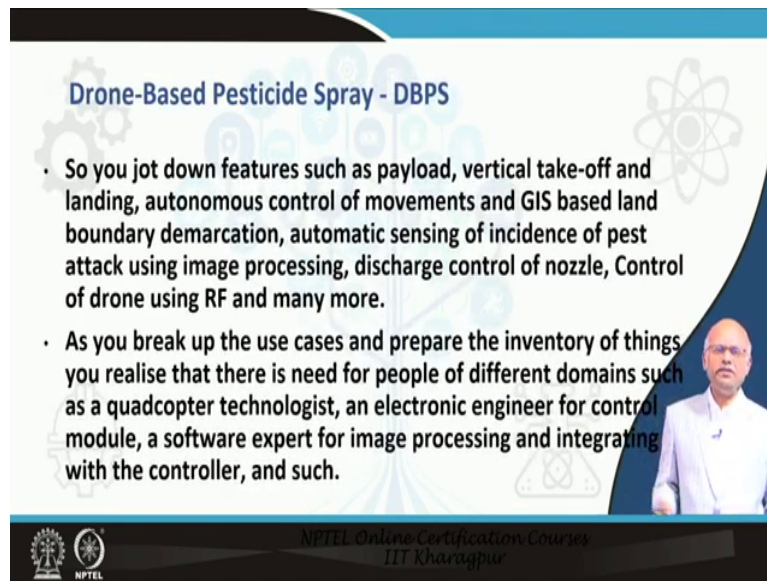
- You are knowledgeable about drones as part of your hobby but never really thought of applying it in real useful purposes.
- You start connecting the dots and it dawns on you that drone may be used to spray pesticide.
- You decide to go forward and experiment if the idea is feasible.
- You try to imagine what all features the drone could have to make it a useful tool for the cause.

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So, or maybe before even thinking of drone you explore as to what developed countries are doing and then you realize that they are using unmanned plane. So, you think that drone is the thing that should help. Now how should you start? You should start with a minimum viable proposition or product.

What is that? You should not actually start building a drone, you should buy a drone and just attach the pesticide tank or cylinder and then some releasing system. Show it to 1, 2, 3, 10 farmers; get their feedback. If they say that this is wonderful, we are ready to buy then start gradually start adding value and then eventually before you commit lot of capital and lot of other infrastructure investment move gradually.

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Drone-Based Pesticide Spray - DBPS

- So you jot down features such as payload, vertical take-off and landing, autonomous control of movements and GIS based land boundary demarcation, automatic sensing of incidence of pest attack using image processing, discharge control of nozzle, Control of drone using RF and many more.
- As you break up the use cases and prepare the inventory of things you realise that there is need for people of different domains such as a quadcopter technologist, an electronic engineer for control module, a software expert for image processing and integrating with the controller, and such.

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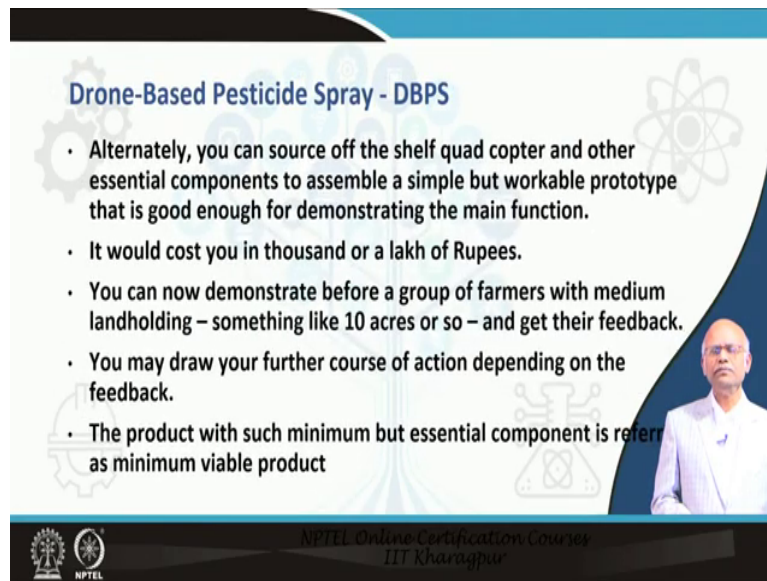
Drone-Based Pesticide Spray - DBPS

- Traditionally, people start developing a complete product, test for various desired operations, stability, and performance.
- It may entail crores of Rupees of investment and years of development time.
- Once satisfied, they put up infrastructure to manufacture them.
- They may not have much idea if the market will accept the product.

The slide features a background with icons of gears, a tree, and a chemical structure. A small video inset on the right shows a man in a white shirt speaking. The bottom of the slide contains the NPTEL logo and the text 'NPTEL Online Certification Courses IIT Kharagpur'.

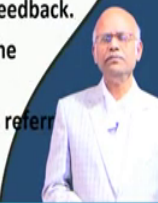
So, that you do not end up spending so much of money that eventually you are if this becomes unsustainable. You can pause and read because I am running out of time.


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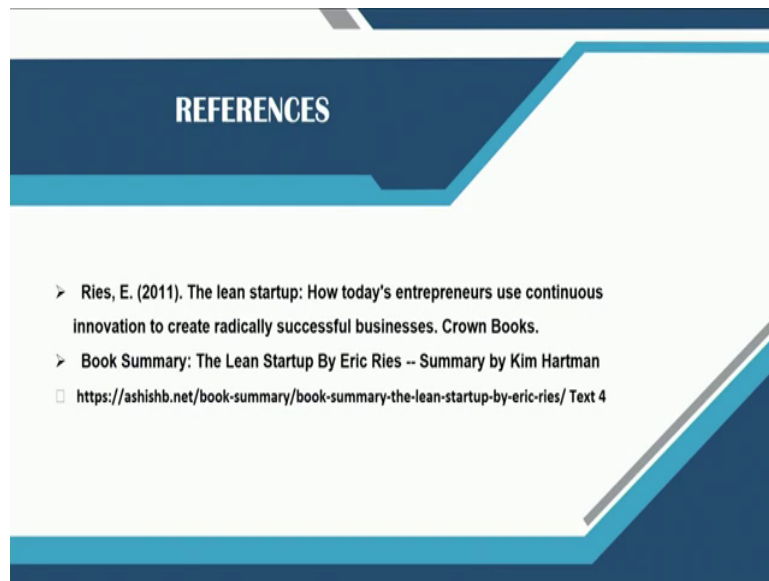
Drone-Based Pesticide Spray - DBPS

- Alternately, you can source off the shelf quad copter and other essential components to assemble a simple but workable prototype that is good enough for demonstrating the main function.
- It would cost you in thousand or a lakh of Rupees.
- You can now demonstrate before a group of farmers with medium landholding – something like 10 acres or so – and get their feedback.
- You may draw your further course of action depending on the feedback.
- The product with such minimum but essential component is referred as minimum viable product



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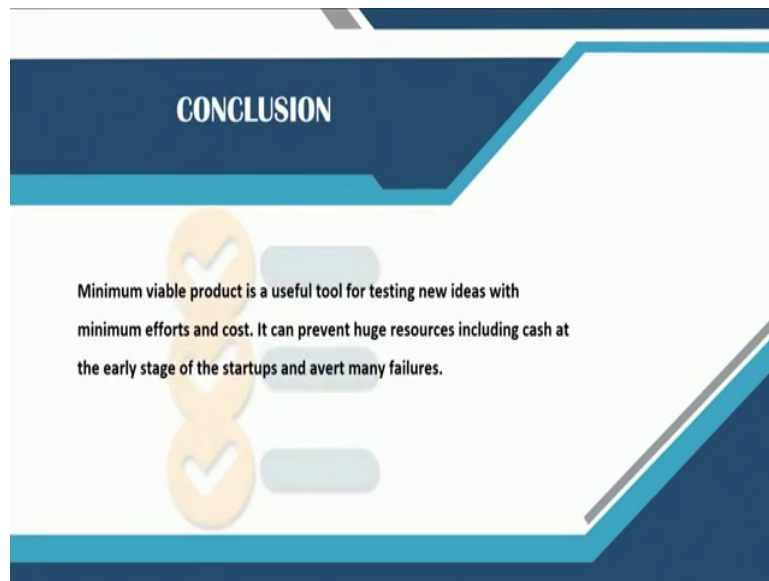
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Some references and a brief comment.

Thank you so much.