

Course Name: Business Fundamentals for Entrepreneurs – Part 1 – Internal Operations

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Week – 03

Lecture – 05

Week 3 Module 5 Part 1

Namaskar. I am Professor Devdip Purkayastha from the Indian Institute of Technology, Bombay. Welcome to my course Business Fundamental for Entrepreneurs Part 1 Internal Operations. Today's module is module number 5. It's called Innovation and New Product Development. But before I get into the module, let me recap the course flow.

In the previous four modules, I have talked about the basics of what is business. What is a company? What are the kinds of companies? How do you create new companies? And then I started going inside a company with a big picture view of what is the vision of a company, the mission of a company, the goals of a company, the strategy of a company and the culture of a company. And I give you a lot of examples from Indian companies and multinational companies. And why is it important that you start with understanding the big picture first before you get into the operational aspects? Because if you are a student and you are deciding whether to get into business or other lines of education, it's good for you to understand what is business all about? What is a company all about? If an entrepreneur, it's good for you to know the big picture of a business or a company because you have to start your own business and your own company and you have to start at the top.

If you are an employee already, you may know about your function, your role. But it will be good for you to know the totality of your company and other functions and other departments. Today, we are starting to get into the operational aspects. And the first operational aspect is how to innovate and create new products because there is no business without a product unless you are a charitable business. So the question is how do you create and launch a new product, an innovative, a novel new product? So, we will start with that today.

And then over the next few modules, I will talk about other aspects of operations. The next module will be if you have designed and created a new product, how do you mass manufacture it? How do you ensure quality control? How do you account for your finances? Importantly, how do you lead a company and how do you manage the employees of a company, the human resources of a company? And finally, how do you take care of the environment and society even as you run a business? Today's module, as usual, will have six

topics. There will be two reflection points where you will have some time to think about what you have learned and, apply it and write down in your journal. And there will be one online assignment. So today's topics are around what is innovation? What are the drivers of innovation? What are the types of innovation, the innovation process itself? And then once you have innovated, how do you transfer it into a whole new product and launch it in the market? So these are the topics for today.

So, let's start with what is innovation? Innovation is creating a new, novel product or, service or process, that for the customer, is better faster, or cheaper or gives more satisfaction versus what he has today. Innovation is considered the lifeblood of a company because, without products, you cannot have a company. There's no business. There's nothing to sell. But you can't sell the product, the same product, for years or decades because other products would have come up.

Customers would have changed. Generations change. New technology has come in. So you have to keep changing your collection of products or your portfolio of products and you have to keep launching new products. And that's innovation.

But innovation cannot be just one employee saying, okay, let's innovate or a group of employees saying, let's innovate. And today you innovate and tomorrow you do something else. So innovation has to be a discipline process in a company led by the senior management and with allocation of resources, facilities, research facilities, testing facilities, development facilities and with a lot of training. And it also needs an external focus because you cannot innovate something which nobody wants. So, you have to have a good feel of the customer and the market and you have to innovate backwards to fill the needs of the customers or the market.

So, let's look at what are the drivers of innovation. And you've seen that in this blog that the first driver is the customer because remember we're talking about innovation in the context of a company, not research in an educational institute. So in a business innovation it starts with the customer because it's no point innovating and creating a product for which there are no customers. Nobody wants to buy it. So, it starts with understanding the customer.

Who is the target customer? Young, old, male, female, religion, caste, education, income levels, India, outside India. So who's the customer? And how many customers are there so that you can understand the market itself? It's no point innovating a product for which there are only ten customers or 20 customers. You want to innovate and create a product for millions of customers, tens of millions of farmers, a crore or 10 million or 20 million of students or 100 million or 200 million of people who want to be better. So, we first start with the customer before we innovate. And then the work that we have to do in innovation process is the product itself, the problem that we are starting to solve and then the benefits.

So, let's start with the problem. So you have understood the customer and you've identified probably a million customers or 10 million customers are the target customers for this innovation. Question is what problem are you trying to solve for that customer? If the

customer doesn't have a problem, he will not buy your innovation or your new product. So, to really understand the problem that the customer has, maybe he's losing an opportunity. He wants to go from point A to point B and it takes him five hours, but he wants to go in two hours because then he's wasting three hours and then there is an opportunity loss of three hours of time for the customer.

It could be a job not done. I want to do this, but the current product doesn't allow me to do this. I want to shoot a very high quality video, but my current product doesn't allow me to shoot a very high quality video. So job is not being done.

An unmet need. I need to go faster. I need a car which is faster. I need a food which is tastier. I need my grocery quicker.

So, an unmet need. Also scalability, which means more and more customers can use that innovation. Is that problem for many people or just a few people? And finally, urgent. How urgent is it? It's like a vitamin versus a headache drug. A vitamin, even if you don't take it for a day or two days or a year or two years, maybe nothing bad will happen. But if you have a headache, you need that headache medicine urgently.

So, to understand the urgency of that need. Once you've understood these two, then you do your research and development and prototyping work to start creating a new product. And then you start looking at what technology do I use? Hardware, software, robots, drones, artificial intelligence, machine learning, whatever technology. The next question is software, as I said, hardware and software. Then you start designing the features, prototyping it.

If I'm building a whole new type of camera, should the camera be this big, this big, this big? Should it be round? Should it be square? Should it be flat? Should it be fast? Should it be slow? So these are the features. And then the quality. If you're designing a phone, what is the quality of the screen? What is the quality of the back? Is it waterproof? Not waterproof. Is it glass or plastic? So that's quality.

And usage. Ideally, your product should be used more and more. Is the difference between a phone, which many of you use for hours in a day, versus maybe a pen, which you use for when you're doing some work, or a glass, which you use only when you drink water, which is a few minutes. So how often is the usage? Once you've got the products, innovation also includes a definition of what is the advantage of this new product in solving that customer's problem. Who is the customer? What is the problem that the customer has? What is my new product and what is the benefit? And in benefit, the classical benefits are, is it cheaper? Can my new innovative product do what the existing products do, but it's cheaper? Can it be faster? I have a cycle, but can I put a gear on a cycle so I can pedal faster and travel faster? Better. The better could be a look and feel.

I hold this and I like the feel of it. Better could be the weight. It's too heavy or not so heavy. And then ease of use. If you look at the touch phones, they're quite easy to use because all you have to do is swipe.

But before that, earlier generation phones had keyboards. So, if you had to use the phone, you would have to type on the keys and then the touch screen phone came and it's so much easier just to type or swipe. So ease of use. A good example being a smart phone versus a keypad phone. It's also how satisfying is the new innovation.

For example, if it's a food, is it more tasty? If it's a drink, do I feel better after drinking it? If it's a toy, am I happier? Is my child happier playing with the toy? Also, the aspect of social responsibility. Maybe the innovative product pollutes less. It's less polluting.

It's less dangerous. It's safer. So those are most satisfying. Now once you have all done all of these as an innovation process and identified the customer, understood his problem, created some new products, understood the benefits, there's still a big question around is my innovation affordable? You can create an excellent watch or an excellent car which nobody can afford. It satisfied all of this. It's very fast.

It's very comfortable. It's got all the features. It doesn't pollute. But it's so costly, nobody can afford it. So that's the balancing factor of everything that you see in between. And innovation has to satisfy all of these drivers.

So, these are the drivers of innovation. Let's look at a few examples. Let's look at a few examples of is there a problem and how a new innovation solved that problem. Let's go back thousands of years, maybe 5,000 years back. Remember, today we take a wheel for granted.

There's a wheel in every aspect of our life. But the wheel did not exist 5,000 or, 6,000 or 10,000 years back. Someone invented it. So in that time, wheel was an innovation.

So, let's look at the innovation drivers. So, if you look at the wheel, who is the customer? Anybody who wants to travel or anybody who wants to carry some goods. So that's the customer. And what's the need or the benefit that the wheel offered? A, if you're a traveler, you can travel faster with the wheel because you can make a chariot or a cart, and a horse can drag it. So faster than walking. You can also carry more goods versus carrying it on your back.

So that was a potential customer. That was a potential benefit. And what was the novelty? Why is it innovation? Because before that, people are walking on feet and carrying the goods on the back. And now, you can put it on the cart. And therefore, many thousands years back, this was an innovation. And I've got a few more examples because it is very important whether you're a student or an entrepreneur or an entrepreneur, innovation is a key skill you need to learn for the rest of your career.

So, let's look at a few other examples. A few hundred years back, the printing press was an innovation. Today, we take books for granted, magazines, newspapers. It did not exist. Paper did not exist a few hundred years back. And definitely, you could not print on the paper.

So, let's look at the problem, solution, and the novelty. What is the innovation? Who was the potential customer? People who wanted knowledge, students, then entrepreneurs, then businessmen, anybody who wanted knowledge. But what is the benefit of the printing press? Now for the first time, on paper, you could print, which means you could store knowledge, you would distribute the knowledge because you can spread the paper and the books, and you can preserve knowledge. And what was the innovation? Before that, before the printing press, knowledge could only be transferred orally. So, the teacher or the guru would transfer the knowledge by speaking to the students or the disciples.

But with the printing press and printing on paper, knowledge could be transferred through reading and writing. Let's look at a few more examples. A couple of hundred years back, the light bulb was invented. Today, we take it for granted. But before the light bulb was invented, let's look at who the customer was, what (are) the potential benefits and what is the innovation.

The customer was anybody who wanted to see in the dark because, before the light or the light bulb, people could not see in the dark. So anybody who wanted to see in the dark, which is 100 percent of the population, was the target population, was the target customer. And what is the benefit? Earlier, there were candles, or you had to burn wood. But candles did not last forever. You have to keep changing the candles very frequently.

And there's a risk of fire. And candles were very dim. But with the light bulb, it was safer, it could last longer, and you'd get more bulb, more light. And what is the innovation? Moving away from candles and burning wood to an electric bulb. That was the innovation cycle.

Let's look at one or two other examples. About 100, 150 years back, the automobile was invented. So, who was the target customer? Who was the innovation for? Who did people industrialized like Henry Ford invent the automobile for? The target customers, anybody who wanted to travel, go from point A to point B. People did travel before that. They walked, or they took a horse, or a donkey, or they rode on a donkey.

But the horse could only travel so far. And the horse would die, needed a lot of care, and so on. With the automobile, you could go faster, overtime, cheaper, because the horses were expensive, and you had to feed them, and you needed to maintain them, and you needed space for them, and you needed many horses. So, one car could replace many horses, one automobile. So faster, could travel longer, easier. You did not have to learn, you had to learn how to drive, but you did not have to learn everything about breeding a horse.

And the innovation was horses and carts to this automobile, which we are still using today. Let's go on to the next innovation. Then, a few decades back, the computer was invented. So, who was the target customer again? Anybody who was using data and wanted to manipulate data to achieve certain objectives, like adding, subtracting, multiplying, calculating formula, doing scientific research. But earlier you had to do it, you had to add, or subtract, or multiply, pen and paper.

It was very cumbersome you can imagine that. And then, of course, in between you had the calculator, which some of us still use. But with the computer, you could do everything much faster and much more. And slowly computers become faster, they become better, and they become cheaper. And innovation was going from manual on paper calculations into electronic calculations.

In fact, the phone that you use today is at heart a computer. The wearable, the smart watch, if any of you have it, is a computer. The car will probably have one or two microprocessors inside it, the car that you ride or the bus that you ride. If you ride an airplane, it will have many microprocessors or microcomputers in it. So there are computers all around us today, better, faster, cheaper, with a lot of benefits.

Let's look at the next example. The cell phone. Chances are all of you are watching this video and taking the course have a smartphone. You may be taking the course on a smartphone. But before the smartphone came was this concept of a portable phone. Before that, phones were fixed on a desk, and there was a wire which connected the phone to the exchange.

But you cannot walk around with it. You cannot drive around with it. You cannot carry it in your pocket. And therefore, the first cellular phone was a huge invention. Of course, the one that you see now has become today's smartphone, which some of you are, most of you are carrying. But what is the customer then? Anybody who wanted to communicate on the move, not in a fixed place in an office or at home.

Today, practically everybody wants to communicate on the move. And what was the benefit? Easier communication, on the move communication, from anywhere. And what is the innovation? From fixed communication to mobile communication. Next, the Internet. All of you are probably accessing this course on the Internet. You've gone to a web page and you've clicked on it and you're watching this video.

I've gone to YouTube and watching this video. That's on the Internet. And that was a huge innovation. So, just like the printing press that I talked about made a step change in how knowledge was transferred from oral to written, the Internet allowed knowledge to be transferred, just like I'm transferring my knowledge to you on a computer on the Internet. So who's the customer? Anybody who wants to connect to social media or WhatsApp, or connect to a course like this, or connect to an OTT platform like Netflix, or connect to an e-commerce platform like Amazon or Flipkart or Mintra, or connect to a hotel app or a booking app. So, anybody who wants to connect is a potential customer. And again, what's the benefit? The cellular phone allowed vocal telephony, which means you could talk to each other.

But with the Internet, coupled with the smartphone, you could interact and transfer knowledge and do a whole bunch of things from anywhere. It's mobile. You can take this course from anywhere or watch a movie anywhere. So faster, better, cheaper, more convenient, easier to use. And what is the novelty? You have moved from paper-based to electronic, digital information.

So, I gave you a few examples of trying to identify a customer and a problem and to develop a solution for that problem in a way that is affordable and better, faster, cheaper than everything that exists today. I would encourage each of you, whether you're a student again, entrepreneur or an employee, to sharpen your skills of innovation. And to help you do that, we'll take the first reflection point, and the task is as follows. I'm going to give you three examples in the next few slides, in the next three slides. Over the next three minutes, I'd like you to write down in your journal and think about the questions that are written on the screen.

For the three examples I'm going to show you, think about who is the potential customer. Think about what is the novelty value of the products that I'm going to show you in the next three slides. What is the novelty value? And what do you think are the benefits of the innovation that I'm going to show you? But first let me show you the three innovations. Innovation number one is artificial intelligence.

All of you would have read about it. Some of you are studying about it. Many of you, most of you would have heard about it. Artificial intelligence is a programming technique, a highly sophisticated programming technique which allows you to do certain things digitally. And the latest example, which is a buzz, is about Chat GPT. If you have not heard about it, please do an internet search and understand what Chat GPT is all about. So, think about the problem solution fit for this innovation called artificial intelligence.

Who is the potential customer? What is the novelty value of this innovation? And what can be the benefits to the customer for this innovation? So that's example number one. Example number two that I want you to think about are drones. Drones are small, unmanned flying objects. They fly without a pilot and they can be this big or this big or this big and they can carry things with it. If you need more information on this innovation, please look it up on the internet and then start thinking about who can be the customer of a drone.

What is the novelty value of this drone? And what can be the benefits to the customer of using this drone? As you think about it, it will help you sharpen your innovative thinking. So, the third example is robots. A robot is a mechanical, electrical, moving object. Sometimes, it looks like a human person. Sometimes it could just be a robot on wheels which can carry things from point A to point B.

But again, it's unmanned. It can move around and it can do things. I would encourage you to read up on the internet about robots. But for the purpose of this course and for you to develop your innovation thinking, don't think about the computer science or the, electrical engineering or the mechanical engineering of a robot. Think about the business aspect of a robot, the business innovation aspect of a robot. And the three questions are who can be the customer of a robot? What is the novelty value of that robot? And what can be the benefits of a robot to the customer? Again, I encourage you over the next three minutes to write down in your journal the questions you can see on the screen and sharpen your business innovation thinking.