

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

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Week 3 Module 6 Part 2

So far, I have talked about cars and phones, but I have also mentioned about food processing, etc. In food processing, chemicals, metals, there are no components, but they are raw material. And therefore, the processes are more biological, chemical, mechanical, if you are processing let's say steel sheets. So that's where the processing part comes in. And especially in food, it could be as simple as grinding, which means taking the husk of the cereals. To have highly sophisticated chemical processing with adding preservatives and other components to increase the taste or the shelf life of the food.

So, if you look at different kinds of food processing, in the picture on the left side are the ones that are minimally processed. The simplest is a coconut, which needs to break open to eat the coconut. And then there are processes like juices. And then there is ultra-process, which you will probably get in a restaurant, cookies or chips.

All of these need different degrees of food processing by the company which is providing them. Let's look at a different aspect now of beverage. Let's say if you are having a beverage, a soft drink, you will drink a bottle, but the company has to produce a million or a billion or ten crores or a hundred crores liters of that beverage. And it could be as simple as pure water, bottled water. So the processing will include the purification of the water and then various steps which adds different chemicals to the water to make a soft drink.

And then the bottling into thousands or hundreds of thousands or millions of bottles every day. And some of these bottling lines can go up to a thousand bottles a minute or two thousand bottles a minute in terms of pouring the juice into the bottle and capping it. That's about food and beverage. Let's look at steel and making of steel rolls from raw steel. These are all highly sophisticated, capital intensive, very large factory based production processes.

And then very different is a chemical plant which can create millions of liters of a chemical based on multiple entry chemicals, component chemicals, all running into millions of liters. So that was about assembly line for product companies like cars, phones, food, and chemicals and metals. So we've covered some of the components of mass manufacturing, the product specification, the sourcing of the components, the assembling of the

components. Let's look a little bit now into the movement of the goods. Because if you bring in the components, all the chemicals or the commodities in the factory and take them out, and all of that together is called logistics.

So, logistics is essentially the efficient flow of goods, but also the flow of information associated with the goods. Because if you bring in a million tons of something or you ship out a million pieces of finished goods, you still need to keep the information flowing as well. And logistics can be at different stages, coming into the plant, going out of the plant. And there can be various modes of trucks, warehouses, ships, planes, and I'll show you some examples later on, which all go into this concept called logistics. So, what are the logistics services? What are the different components of logistics? First of course is what is called warehousing and fulfillment.

Warehousing essentially, and I'll show you some pictures and case studies, are where you store a lot of products together. Big rooms, big warehouses, big sheds, and then you take them out as and when needed. So that's warehousing and fulfillment. And then you have transportation and distribution. Again I'll show you examples later on.

But this is about movement of goods at different stages. But you also have something which you may not think of as a customer, which is if you bring in goods from outside of India into India, there are taxes which gets levied, which is called customs. And you pay those taxes. And there's always a risk that the goods will get destroyed or burnt in transit. So, there's insurance of the goods.

And then there's a risk of storing the goods. Fire, chemical leak. So all of this needs to be managed as part of logistics services. And then there's this integrated logistics concept where you manage the entire flow end to end, and I'll show you an example later on, of where all the pieces are integrated. And the last piece is what is called green logistics, which means that you reduce the carbon footprint of logistics activities.

Because logistics can emit a lot of carbon as you're moving the goods, as you're storing the goods and using electricity for light or air conditioning, or for the movement of assembly lines. So green logistics. But let's look at a few case studies. I talked about warehousing. This is what a large warehouse will look like.

You can see the racks. And you can see the cartons where actually the goods are stored. And this could be components. And this could be finished goods. And in between you can see what is called a forklift truck or a jack, pallet jack, which moves the goods within the warehouse.

And this is how goods can be moved from the warehouse into a truck. And you can see a forklift truck there. Because remember, if you're moving a thousand pieces or ten thousand pieces or a million pieces, you cannot just move them one at a time by hand. You need machinery to move them quickly and in large volumes. So that's where material handling comes in.

And forklift is one example which you can see in the picture. So, warehouse, you have loaded them into the truck. But it's not just about trucks. A lot of components are sourced across countries. A lot of components comes in from China or US or Europe.

And remember, this is not one piece. These are millions of pieces. So, across the ocean, goods are moved in what is called containers. And you can see a picture of a container ship. So, there's a large ship, and those boxes that you see are container boxes.

They are looking small in the picture. But in real life, they could be 40 feet long or 20 feet long. They can be very big actually, carrying thousands of pieces inside them. So that's on ship. You can also move it on planes.

Most of you may have seen or ridden on aeroplanes. These are passenger aeroplanes. But a lot of goods also travel on aeroplanes. And here's a picture of an inside of the aeroplane and goods being stored on the inside of the aeroplane. So logistics services which are airborne.

And these are trucks. All of you would have seen that. These are trucks which are carrying large quantities of goods. Nine tons. Each of those trucks may carry nine tons or, 12 tons or 20 tons. And some of the big trucks can carry 20 tons or 40 tons of goods.

Thousands of pieces of goods. So we saw ships. We saw planes. We saw trucks. These are tankers for chemicals or milk. So this can be a tanker which is carrying petroleum products to a manufacturing plant for fuel or usage.

It could also carry milk. Some of the tankers of milk take milk into a chocolate plant because the chocolate uses milk. And the milk then has to be temperature controlled. So these are carrying commodities and milk or chemicals. But that was about how goods are carried in bulk. Now let's look at a case study of Indian fast moving consumer goods supply chain.

And this could be food items. Rice.

Onions. Potatoes. Wheat. Biscuits. Or washing powder. Soaps. Detoxins.

Shaving. Perfumes and deodorants. These are all what are called fast moving consumer goods. Let's look at a case study of how outbound logistics will look like. We talked about manufacturing in a plant. So on the top left you'll see the manufacturing plant. But the manufacturing plant is producing thousands and millions of pieces every day.

It cannot store it. So as soon as it's produced it will go out in trucks or ships or airplanes into what are called carrying and forwarding agents which are basically warehouses run by the company. From those carrying and forwarding agents of the company warehouses it will move to different kinds of trade formats from where a consumer such as you can buy the packet of biscuit or the deodorant or a pen or paper. And I'll show you some examples in a minute. So here is a case study of where it goes from step by step from a manufacturing plant into a company warehouse into different kinds of stores from where you can buy.

That's called outbound logistics. So, I talked about warehouses. A warehouse is something where you cannot walk in and buy one piece. A warehouse will stock the company's goods in large quantities. So you can see in this particular picture goods being stored in cartons and that one carton can carry 12 pieces of bottle of water or 24 pieces of a biscuit packet or 100 pieces of a small blade packet.

Examples. So that's a warehouse. Outbound. Here is another warehouse of vegetables, onions and potatoes. A customer such as you will not buy a whole sack load of potatoes or onions. You will probably buy half a kilo, one kilo, two kilo, three kilos. But to get you that one kilo, two kilo, three kilos, the stores buy in sacks and they break it up and give it to you in small loads.

So, these are also warehouses. You looked at the big ships, containers, airplanes and the big trucks. But imagine the small kirana store next to your house or your village. That kirana store doesn't need a whole truck, big truck load. So companies will use small truck loads like this to deliver small lots, 100 pieces of this, one small carton of that to small kirana stores or small stores. So these are delivery vehicles also called last mile.

And if you're ordering food from a food delivery service, a swiggy or zomato or any of those food delivery services, you'll find even smaller lots, a small parcel of food coming with a person who's coming in a scooter or a bicycle or a bike. That's called the last mile, which is coming to the last house of the consumer or the last store from where you buy. And what are the last mile destination looks like, where a customer like you can buy? So this is a Kirana store. This is where you can buy actually one piece of a packet of chips or biscuits or bread. It's a small store, what you probably have next to your house.

And then you go to a bigger store, which you probably see in a mall. This is a bigger self-service store, which you'll see in a big mall like this. So the manufacturing flow starts from buying of the components, assembling, quality checking and then outbound logistics, which allows a customer like you to buy. Let's look at a slightly more sophisticated case study for those of you who want to make supply chain as a career choice.

So, they're very good supply chain companies. They're across the world and in India, and they provide very good career options. And as entrepreneurs, you could also start up a supply chain company. So let's look at a bit more complex supply chain case study. This is about DHL, which is the largest supply chain company in the world, and how they have an automotive set of services. So, if you go to the website, I encourage all of you to visit the website and read the material there.

The link is at the bottom of this slide. You'll find all the activities that an automotive manufacturer has to do to manufacture thousands of cars or millions of cars every year. And how a supply chain player will support the automotive player. And if you look at the screen, you'll find there are steps of supply chain, starting with planning, sourcing. Making. What making means is that if you have an assembly line where the car, the body of the car is moving, you have to fit, supply small components at every assembly station.

So that's called line-side logistics. And then you get into delivery of the finished goods because the cars have to be taken out and specialize large vehicles. And also sometimes there are returns. The car may be returned to the factory. So there's a whole inbound, outbound logistics involved in automotive manufacturing. And again, to give you case studies, this is what a typical assembly line of a car will look like.

I'm using car as an example because it's a very sophisticated product and a very complex manufacturing process. Again, I told you before of how at every station components are being fitted into the car, manually or by robots. And this will be the typical warehouse where lots and lots of components, as is Chris Carson, coming in from component manufacturers going out to the assembly line. So, this is what a sophisticated logistics operation will look like. I have talked about many parts of the manufacturing process so far, except one.

So far, I've talked about the product specifications, sourcing the component as part of the product specifications, assembling the components or the chemicals or the food or the metals. I've talked about inbound logistics, which is bringing in the components and the raw material and, the packaging material and the chemicals and the commodities like sugar or milk into the factory. And taking out the finished goods, a pen, a pencil, a packet of chips, a biscuit, a packet of detergents, car, phones, taking it out from the factory and step by step reaching out to a customer such as yourself. The last part and the very important part is now the aspect of quality management. If a customer like you buys a product, you assume first of all that it works as per the specification sheet or the data sheet.

It does what it is supposed to do. And B, that it doesn't break down or stop working or malfunction after a while. Or if it's food, it doesn't go bad. Or if it's detergents, ten packets of it work well but the eleventh packet somehow doesn't work, it doesn't clean clothes anymore. And that's the aspect of quality management.

And again, it is a career option by itself. And some of you may choose a quality management career for yourself. But looking at quality, a good place to start are a couple of quotations. The first is by Mr. Tata who said what's on the screen, aim for perfection, 100% accuracy, 100% quality, 100% compliance.

And if you aim for that 100%, you'll get to excellence. But if you don't care, chances are your products will not function or start breaking down and you'll lose all the customers that you have. And the second part is that quality is remembered much after the price is forgotten. So if you buy that phone which you have waited to buy and saved money for a very long time, after a year, you may not even remember the price. Because the price keeps changing. But if the quality is good for that phone, you will enjoy using it and you'll tell others.

And that's quality. So, what does quality management involve? Obviously if you're making a million pieces every day or week or if you're making millions of liters of a chemical or a beverage or you're making a million tons of a metal, you cannot check every piece. It's just impossible. So there is a set quality management process which at a high level looks like

this. You first set the standards. And I'll show you later on some of the standards required by the government.

But you set the standards and say my product will work like this. With this kind of failure rates, this kind of tolerances, etc. Once you've set the quality standards, you cannot test everything, every piece. So what you do is you start taking samples. Maybe one per hundred or one per thousand or one per ten.

You take the sample, and you test it. And if you take the sample and it works well, chances are the whole batch, the whole lot will work. But if you take a sample and it doesn't work well, then you analyze what is broken. Why is it not working? Why is it not doing what it's supposed to do? Why is it breaking down? And that's called the variation analysis. And once you have found the variations versus what it's supposed to do, then the company or the engineers have to spend a lot of time doing what's called a root cause analysis, trying to find out what is causing that failure.

And then of course take a corrective action. It could be on the design itself or the formula. It could be on the component side. The component was bad. For example, if you are having a food juice and you're adding some sweetness of flavors, maybe one batch of flavors was bad and therefore the entire fruit juice stays bad.

Then the component is bad. So it could be any of the reasons why the final product is not as good as it's supposed to be. It doesn't meet the quality standard. So, you fix it and then you keep going back round and round until you make sure that your products are okay, 99%, 99.5%, 99.9%, 99.99%. If you're making a million pieces a day, for example, a million liters a day, 1% of a million pieces can be a very large number of failures and a large number of customers who are not happy. And that 1% of customers who are unhappy can actually destroy the product because they will be complaining about the product and others will also feel uncertain as to how good the product is. And therefore quality management is a key component. And even from a government perspective, there are a lot of laws and regulations which request that the company follow certain standards because the government is trying to protect customers such as yourself from bad products made by bad companies. And if you look at the list there, you'll find that there are many aspects and many regulations on different kinds of products.

Food. To protect customers such as you from adulteration, which is fake food, bad food, counterfeit food.

There are laws. Meat. Milk. There are laws around weights and measures. For example, if a company sells its one-kilo product, it has to be one kilo. It cannot be 900 grams because the company is then cheating customers such as yourself. So that comes under Weights and Measurement Act. And then there are certain purification marks.

For example, if you're buying gold, there's a purity mark on gold. But even if you're buying a food product like ghee or butter, there are standards that have to be made. Explosive acts, energy conservation acts. This is to make sure that as companies are making the products,

they don't do anything which is harmful to the society. So be aware that not only does a company have to fulfill the quality obligations and the quality standards, they also have to comply with government regulations. So these are all the aspects of manufacturing, starting with the product specification, sourcing of the components, assembly, and processing into the finished goods.

The inbound logistics where everything comes to the plant. The outbound logistics where goods go out from the plant and the factory into customers. And then above all, the quality control. I would now like to think and encourage you to think about what we have learned so far.

So, think of a product that you're using. Don't think of a car or a phone. Now think of a packet of chips or a detergent or a deodorant or rice or atta or even vegetables, onions, potatoes, whatever. Think of a product that you're using. Where did you buy it from? So, what was the outbound logistics? If you bought it from the Kirana store or, the mall, or online, how do you think the logistics were before the product reached you from the factory? Look at the packaging of the product and think about what components, what packaging material went into the packaging of the product. Plastic, bottle, paper bags.

What is the packaging? Study the quality aspects of the product. Are the chips fresh? Is there a bad smell? Is there a bad taste if it's a food product? Does it leak? So, what are the quality aspects? And think of two or three ways by which you can improve the quality of the product. Because if you want to start your own business, these are the aspects which you have to be very confident about to build a successful business. So, I encourage you to spend three minutes thinking and then writing down in your journal about what I've asked you to do in the slide.

So, with this, we come to the end of the sixth module. Thank you very much. Till the next module, good luck. .