Course Name - Operations and Revenue Analytics

Professor Name - Prof. Rajat Agrawal

Department Name - Department of Management Studies

Institute Name - IIT, Roorkee

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Welcome, friends. As we have already discussed, there are multiple uses of operations analytics. We discussed how operations analytics can help us in different decision-making activities related to operations management. Over time, a very interesting usage of analytics—which is part of operations analytics—has also been researched. In this particular session, or rather from this week onwards, we are going to discuss that very aspect: how we can maximize our revenue using the principles of analytics. We have different types of organizations.

In some organizations, you can increase or decrease the capacity, but in some organizations, you cannot increase or decrease the capacity in a short duration. So, here comes the role of the power of analytics, which will help us maximize our revenue. So, in this particular session, we are going to discuss pricing and revenue management's introduction. Generally, whenever we talk about pricing, disciplines like economics, marketing, or finance come to your mind.

So, some of you may wonder how operations management can contribute to pricing and revenue. So, that is going to be a very interesting, you could say, new input for all of us: how pricing can be a very important aspect. Those of you who have taken courses in supply chain management may recall that there are different types of drivers of supply chain, like facility, inventory, transportation, information, sourcing—and one of those drivers is pricing. There, we also discuss how pricing can play a very important role in matching demand and supply, as price is generally determined based on the law of demand. When you set the price according to the demand conditions.

If demand is more, you set higher price for getting more benefit, more revenue. If demand is low, the price will also be low. So, that by keeping the low prices, you can generate extra demand for your product. So, that is what we already know in the principles of economics. But how with some different type of situations, with limited resources you can dynamically change your price or dynamically allocate the resources.

The important thing which we are going to discuss that if you have some amount of resources how to allocate those resources so that you get maximum revenue with those limited resources. So, that is where we are going to discuss in this particular session what is the meaning of Pricing and Revenue Optimization that is one very important aspect we are going to cover. Then we are going to discuss about strategic pricing and price optimization. Because as I just mentioned there are different disciplines, different functional areas which can contribute in deciding the pricing. When we talk in marketing terms, so out of four P's of marketing, one P is dedicated to pricing.

So, marketing people are also considering that pricing is their domain. In finance also when you go for cost accounting so they also feel that they have to calculate the cost and cost plus some profit that will set the price. I also discussed about economics where law of demand so we need to understand that strategic pricing and process optimization what are the difference between these two things. And when I say that operation management will contribute in price optimization or you can say revenue maximization. Our purpose of price optimization is revenue maximization.

So, we will briefly discuss the development of this particular field—how it has evolved over time, its historical background, its historical significance, its applicability in perfectly competitive markets, and some of the important applications of this area, which will also be considered in our discussions. Now, first is the introduction of pricing and revenue optimization in the context of—please remember—since we are talking about operations analytics. So, that will become our boundary line—whatever we discuss must remain within the scope of operations management. So, pricing and revenue optimization is a tactical activity, and when I say tactical activity, it immediately comes to mind that it is closely related to operations management, as the entire operations management is also

a tactical function. However, we have also studied in other courses, particularly those related to manufacturing strategy and world-class manufacturing.

Where we also discuss that it is not only a tactical function but can also provide strategic advantage. If you shift your orientation from reactive to proactive, it can help you gain strategic advantage as well. Similarly, pricing and revenue optimization, though traditionally considered a tactical function, can also be an important source of strategic activity. There are organizations that use it for their strategic advantage. This particular field recognizes that prices need to change rapidly and as often as possible, providing guidance on how they should change.

So, the overall purpose of revenue optimization is not just revenue optimization but revenue maximization. And for revenue maximization, how we adjust prices dynamically? Prices may vary on day one, day two, day three, etc. You must have seen that airlines are the most common example of how airline prices keep changing. Now, we have seen that Indian Railways also uses dynamic pricing for their ticket booking system.

There was a time when they used to have constant price of the tickets, but now in that also we have dynamic pricing. There are many other examples, where you have this kind of dynamic pricing systems and that is the purpose of revenue maximization that by keeping the dynamic pricing you are achieving two objectives. One you are keeping the resources available, you are keeping the resources available for those customers who actually require who are in dire need of those resources and for that dire need they are ready to pay you more revenue, they are ready to pay higher prices. If you recall our classes of supply chain management, there we discussed that there is a condition of responsiveness. Responsiveness means you want to have that product and in order to have that product, you are ready to pay a premium price.

So, if I am ready to offer you responsive services, I also feel that I should be able to charge appropriate that premium price which will help me in maximization of my revenue. So, it is basically dynamic pricing is somewhat related to responsive supply chains so that you are able to maximize your revenue by keeping the appropriate. Here it

is also important that if you keep higher prices in order to get more revenue Maybe no customer will like to avail your services.

So, that also need to be seen that you should be able to utilize your full capacity also and at the same time it should be helping you to maximize the revenue. You can use your entire capacity at a very low price also but then you are compromising with the revenue. On the other hand, if you keep higher prices, it is quite possible that some of the capacity is not utilized. So, there also there is a case of lower revenue. So, what should be the appropriate price on a day-to-day basis, so that ultimately your all the capacity is also used and it also helps you in getting the maximum possible revenue.

That is pricing and revenue optimization. Now, as I discussed, we also need to understand the difference between strategic pricing and price optimization. So, pricing and revenue optimization, which we are talking about, is different from strategic pricing, where strategic pricing is more from the marketing domain. Wherever the primary purpose is to position our product in the marketplace. For example, based on pricing, you can say that this is a luxury product, this is an inferior product, or this is a utility product.

It is just based on pricing itself. So, in which category of customer you want to position your product is possible because of strategic pricing. So, strategic pricing gives you a range that, okay, this product, like in the case of automobiles, most of us know that this is a mid-segment. This is the upper segment; this is the lower segment. So, for example, if I say that this is a car which is under the range of, let us say, 7 to 8 lakhs, you will say that this is a lower segment. Then, from 10 lakhs to 20 lakhs, you can say this is a mid-segment, or maybe up to 25 lakhs. Then, from 25 lakhs plus, you will say this is an upper-segment product.

Whether you are in segment A, segment B, or segment C, this is strategic pricing. While strategic pricing worries about how a product should, in general, be priced relative to the market, pricing and revenue optimization are concerned with determining the prices that will be in place tomorrow and next week. For example, when you see iPhones, iPhones are basically priced in a premium category. Whenever a new iPhone is launched, it is

considered to be one of the premium products in the field of mobile phones. But then comes the role of pricing and revenue optimization.

iPhone may change its prices on weekly basis, on quarterly basis, on half-yearly basis. That is pricing and revenue optimization. They know that when we are launching the product in first week or first month, we will keep this much price and then we will reduce the price to this level and then we will further reduce the price to this level and that price will remain for let us say at least one year. So, keeping specific price number. that number decision is pricing and revenue optimization.

So, you can say that strategic pricing is a broad thing and within that broad framework, within this broad framework what is the price on day 1, what is the price on day 2, what is the price of day 3? So, that you remain within this broad framework that is pricing and revenue optimization setting these boundary conditions that is strategic pricing. Strategic pricing sets the constraints within which pricing and revenue optimization actually operates. So, you are getting these boundary conditions and then within these boundary conditions all different type of price labels which you will like to use for your product that is coming because of pricing and revenue optimization. Now, let us after understanding the difference between strategic pricing and pricing revenue optimization, let us see some historical development of this field and how it is coming to the field of optimization and operations management.

As we know that the environment is highly complex, situations are changing very fast. The conditions which yesterday were there, today is not there. Let me give you one very recent example. We are recording this course in the month of May 2024 and this is the time in Uttarakhand we have started a very famous Char Dham Yatra. So, lot of tourists come from different parts of the country not only country but abroad also to visit these holy shrines.

Now, one of the holy shrine in Uttarakhand is Gangotri. Now, because of upper Himalayan regions the capacity of these shrines are very very limited. The location is so that not more than 2000-3000 tourists can go on a particular day. Now, all of a sudden there is a huge influx of tourists on day one when the doors were opened and as a result

of that lot of mismanagement happened. And because of that mismanagement the local administration, police administration they started applying some kind of ration system.

And unfortunately during the movement lot of traffic jam also happened. And as a result of that since last two days not even a single tourist is there in the shrine. this is requiring dynamic pricing that when you have so many tourists available there you will read the prices to increase but on other day when no tourist is there you have to reduce the prices so that whatever maximum revenue you can earn from your available capacity you should be able to charge. So, these things are happening these days in more frequent manner as compared to the past.

So, the optimization techniques to set prices are required for complex dynamic environment and these things are happening at a much faster rate in the current uncertain environment. We have discussed in various other forums also this term VUCA. And this VUCA is actually characterizing current business environment where we have lot of volatility, uncertainty, complexity, ambiguity and because of these things our this role of analytics, real time decision making is increasing. The first application of this revenue management, revenue optimization, revenue maximization happened in the airline industry in 1980s. So, you can see the in our other operation management courses we discussed that most of the seed were shown in the automobile industry that something happened in the automobile and from there we have developed the concept.

But this concept of revenue maximization and revenue optimization started in the airline industry in the 1980s. And after that, with the rapid development of e-commerce, a lot of data availability through CRM software and various other techniques used in industries like automobile, retail, telecommunication, financial services, and manufacturing, this field of revenue optimization is growing very fast. So, if I see the historical background, it started from the airline industry. And in the airline industry, you will see a few very interesting characteristics. If I ask you to think for a minute and identify some important characteristics that are peculiar to the airline industry.

Now, similarly, in many other cases, since the process started from the airline industry. So, I am taking those examples. One is limited capacity. The capacity of an airplane is

limited, and this limited capacity is also highly perishable. Once the flight has taken off, you cannot use this limited capacity; whatever unused capacity remains is lost. That unused capacity is lost if it is not utilized.

So, the airline industry has a very typical characteristic where you have limited capacity, and that capacity is also perishable. So, you need to see your system and determine how to develop a system where you maximize revenue from that particular limited capacity, and this entire system of pricing— —should make a customer feel that a fair price is offered because a fair price is very much a reflection of the intrinsic value of the product. Whatever product you are offering, it is also very much related to the price you are charging. If you charge an irrational price, people will stop realizing the value of your product.

So, a fair price is considered to be one of the very important aspects of the intrinsic value of the product. So, the concept of intrinsic value is important in understanding revenue optimization and revenue maximization through an appropriate pricing system. Now, a few things we need to understand about a perfectly competitive market also. For this, let us say for 5 minutes we will go into the class of economics and we will see what the important conditions are for a perfectly competitive market. One important condition is that there are a large number, theoretically speaking, an infinite number of firms, but it cannot be an infinite number. So, there are a fairly large number of firms, and each firm has the same type of product, and the substantial share of a particular firm in the market is almost negligible. So, no single firm can dictate the market. We all have almost an insubstantial share in the market. So, no firm has a kind of leading position.

All firms are at the same level. All the firms are producing homogeneous products with identical production processes and possess almost the same level of information. So, all the firms have an equal amount of information as their competitors regarding the market and all those things which are necessary for operating in that particular business, and the products are also similar. However, because of branding, because of marketing, etc. We cannot say that it is a completely homogeneous product.

As a customer, we see some kind of differentiation from product to product. Even if you consider a very simple FMCG product, I know that this is a Parle-G biscuit, this is a Britannia biscuit, this is a Patanjali biscuit. So, that itself is a kind of differentiation. It is not a completely homogeneous product. If I say that they are all biscuits, irrespective of the manufacturer, then I can say that it is a homogeneous product.

But it is not so in the present environment, which is led by marketing phenomena. So, some sort of differentiation exists. It is also the case that there is free entry into the industry, meaning new firms can and will enter if they observe that greater-than-normal profits are being earned. Today, I want to enter the automobile industry, the electronics industry or the FMCG industry. So, entry barriers are not present.

Whenever I feel I can enter a particular industry because I believe it can offer me a better market and higher profits unavailable in other sectors. So, I can enter and exit whenever I want. However, practically speaking, there may be some constraints, such as resource requirements. Different industries may require different levels of resources and I may not have that level of resources. So, that may be a constraint, but theoretically, there are no specific barriers—anyone can enter the industry of their choice.

Continuing further, the effect of this free entry is to push the demand curve facing each firm downward until each firm earns only normal profit. So, what happens because more and more firms are entering this particular industry? So, now the demand is there, and a new firm will also enter. So, this new firm will also take some market share. And because of the entry of more and more new companies—new firms into the market—the demand curve of existing organizations (demand curve means the demand for their products) will go down.

And each firm will make only the normal profit, at which point there is no further incentive for new entrants to come into the industry. So, when you have only normal profit, you can say that in a perfectly competitive market, firms make only the normal profit. And therefore, there is no incentive for a new entrant to think, 'Okay, I will have the opportunity of making better than normal profit.' That opportunity will not be there

because now it is only offering you the normal profits. So, therefore, you see—for a second, I take you—that when we are talking about startups and entrepreneurship,

They will not like to go into those perfectly competitive markets. They will like to enter into those market spaces where there are better opportunities. So, in the perfectly competitive market, because of the homogeneous products—as we discussed in the beginning of this particular session—the law of demand and supply operates, and therefore, no single firm can raise the price without losing all its market to its competitors. So, if you increase the price, you will be out of the market, and your market share will go to your competitors. So, in this case—in this case, finally, which is important for us to remember from this course's point of view—firms are price takers and can sell as much as they are capable of producing at the prevailing market price.

So, market sets the price as a company as a firm I do not set the price I have to operate at a particular price level which is set by the market and on that price whatever I can make as per my capabilities, my resources, my capacities I will be able to produce and sell on that prevailing market prices. So, therefore, the role of revenue maximization price optimization is not applicable in the field of perfectly competitive marketplaces. Because in that case you are simply a price taker, you are not setting the price. So, that particular field is not in the domain of our discussion. Wherever you have that influencing factor or at least by setting the price you are not going to lose your customers.

If customers are still coming to you like I gave the example of airlines, it may be a hotels also, it may be hospitals also, it may be those where you have some limited number of competitors and each competitor has a very important say in the market. So, in that case the pricing and revenue optimization will be discussed. Now, we coming to the end of this particular video, let us see quickly some of the important applications of what we are going to discuss as you already have the idea from the airline example that where the capacity is limited and the capacity can be perished on a particular time. So, once that time is passed you cannot use that unused capacity. So, that is one important area.

So, like airlines, trains, buses etcetera all these are those examples where if you have a cricket match IPL is going on and if there are some empty seats in the stadium, you

cannot use those empty seats for tomorrow. Whatever empty seats are there, your revenue is lost. In fact, in the cinema halls also, this is equally applicable. So, capacity is limited and it is immediately perishable. Customers book capacity ahead of time.

Now, in all these examples, whether it is a cinema hall, a cricket stadium, an airline, a railway, etc., there are different types of customers. Many customers book their tickets much in advance. There may be a few customers who will book tickets just before the time, but a variety of customers book tickets, booking capacity ahead of time, and prices are changed by opening and closing predefined booking classes. So, generally, you know that if you book, let us say, one month in advance, even in our conferences, we say early bird registration. After early bird, you have the regular price, and then when the conference is about to happen, you have a very different price, which is the on-the-spot price.

So, for example, if this is X, it may be 1.1X, and it can be 1.25X. So, this is just one example where you have three different predefined classes, and prices change from one class to another. So, wherever you are able to define your opening, closing, and predefined booking classes, in all those cases, this revenue management or revenue maximization is equally applicable. So, not only in airlines—if I am a conference organizer, how do I maximize my revenue? I can also use this knowledge for maximizing revenue. I am an entertainer; I hold entertainment shows. So, in that case, how to—maybe you have a few seats, a few front rows, then you have a second category of rows, and then you have a third category of rows. So, how many seats do you want to keep in the first row, how many in the second class, and how many in the general class? So, all these are important questions that we will answer in this particular discussion, and all these are application areas of revenue management. And there are a large number of results because, generally, revenue management is more possible in service organizations. And we know that services contribute because the issue of perishability is highest in the case of services, and therefore, the importance of services is increasing day by day in our overall economic development.

So, the subject of revenue optimization has also become important in the present environment. So, with this, we come to the end of this particular video. Thank you very much.