

Course Name - Operations and Revenue Analytics

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So, welcome friends as we are already discussing about how to optimize our revenue. How to dynamically set the price and we discussed in our last video that there are specific application of this particular concept, wherever we have fixed capacity and the capacity is perishable, wherever we have some kind of predefined booking classes. So, setting the capacity for different types of booking classes where we have lot of uncertainty, there also we can have this type of revenue optimization. But, we also discussed that wherever we have a situation of perfect competition, where you are not price setter, you are a price taker, this discussion of revenue optimization may not be so applicable in those fields. Now, in this particular video, we are going to discuss about labels and strategy of revenue maximization, revenue management.

Here, we are going to discuss labels of revenue management, revenue management strategy. We are going to introduce few new terms like booking control, allotment. We will be discussing some important limitations, drawbacks of allotment. Then we will also introduce a concept which is known as nesting and components of tactical revenue management will also be discussed in this particular session. So, let us first discuss what are the levels of revenue management.

Now, when we talk of levels of revenue management there are three important levels, strategic level, tactical level and booking control. These are the three important levels and as the name says the booking control is something which we have to do on real time basis. Real time may be as and when a new request come you have to accept or reject, whether you are going to offer a booking or you are not going to offer a booking that is

the real time decision making you have to do. So, whenever there is any activity this booking control is invoked and you have to take a call of accepting or rejecting that particular booking request. But, this booking control works on the basis of limits you are setting under the tactical level.

For example, if there is a customer who can pay you rupees 100 for a particular seat in your airplane. For 100 rupees you have only 10 seats. Now, 11th request come. So, as a booking control person you will simply reject, but for example, if this is 9th request you will accept this. So, deciding that 10 seats we will keep for this particular 100 rupee class this is the role of tactical level.

And this tactical level keeps changing the limits also may be over a period of time it feels that there is not much demand. So, can I increase the limits of 10 seats to let us say 15 seats for 100 rupees. So, this decision that we have increasing the quota of 10 seats to 15 seats for 100 rupee class this is also a tactical decision. And you keep changing your limits as per your requirement, generally, it is not on the daily basis, theoretically, you can say it is possible to do on daily basis, but you do SOS as per requirement. Whenever you feel that we need to update our booking limits and you continuously keep an eye on the data which you are generating and which you are getting and based on that data how the inquiries are coming? how the interest of the people is there and analyzing the various indicators of external environment you decide about the booking limits.

Levels of Revenue Management

Level	Description	Frequency
Strategic	Segment <u>Market and differentiate prices</u>	Quarterly or annually
Tactical ✓	Calculate and update booking <u>limits</u>	Daily or weekly SOS
Booking Control	Determine which bookings to accept and which to reject	Real time ✓

A
2000-2000/p.
2500-2200

B
500-1000/p.

RTE

Rs 100/-] (10 Seats)
reject ← 11th rev.
accept ← 9th rev.
15 seats → 100.

And the booking limit is also getting influenced at the decisions which we are taking under the strategic level. For example, in our schools even if you have any kind of school in India there are few seats you have to keep under RTE that is right to education. Now, you are not going to change these number of seats under RTE. Because, you feel that I have positioned my school as a premium school in the city and for that purpose one of the way of being a premium school in the city that I charge very high fee and for RTE quota I have to give admission to the children coming from economically weaker sections I think almost free of cost. So, therefore, It is a strategic decision that I am charging very high level of fees.

On the other hand, there is a school which is running under, let us say, some charitable organization. So, they want that education is a kind of service to the society. So, they will position their school at a different level. So, deciding the broad classes itself, that I have one organization, a school A, and A school B. So, A school has a fee range of let us say 2000 to 3000 per month and this school has a fee range of 500 to 1000 per month. Now, this decision whether we are having the segment A or segment B, this is decided at the strategic level.

So, segmentation of the market and differentiate pricing that is the highest level. If you remember in one of the video we discussed about difference between strategic pricing and price optimization. So, we discussed that strategic pricing is setting the broad boundary, broad class and where we want to position our self. So, that is the strategic level of revenue management that I want to be positioned at premium level or I want to be positioned at medium level etc. And these decisions that next year from 2000 to 3000 I may like to improve to 2500 to 3200.

So, these decisions may be taken on the annual basis and in some cases it may be on the quarterly basis, half yearly basis also. So, these are the three important levels of revenue management. So, as I just mentioned, so at the top level which is the strategic level, it is the identification of the customer segments and establishment of products and prices

targeted at those. So, whether I am targeting the high net worth customers, medium income group customers, low income group customers etc, etc that is the first level. Then at the tactical level as I mentioned setting and updating limits and how much a particular product can be sold at a particular fare to each segment for some period of time?

So, how many seats I will keep at 100 rupees, how many I will keep at 200 rupees and how many seats I will keep at 500 rupees, like a very good example you all can easily imagine. That whenever you are travelling in any airline, so in that airline there are business class, executive class and economic class seats. So, how many seats should be there in the economic class, how many seats should be there in the business class, how many in the executive class etcetera that all is tactical level. Then booking control is the moment to moment determination as I said that decided on the basis of tactical level you have let us say 10 seats, 20 seats in a particular category and based on individual requests which are coming to you to decide about accepting or rejecting those bookings that is the role of a booking control. So, the person who is sitting at the window to whom you are making the request, he is using a simple algorithm.

Your request is coming, he will check the capacity. If capacity is available, he will accept your booking. If capacity is not available, he will reject your booking. And thus, capacities are decided by the tactical level and the broad categories under which tactical level is going to operate that is decided by the strategic level. Now, when we are talking of revenue management strategy, to start our discussions on deeper numerical aspects, first we need to understand that the type of customers who will be there in our service systems.

We have two distinct customer sets, one is the laser customers and another are the business customers. Now, laser customers like I am going for vacations. So, business customers are going for business meeting. Generally, you will see that laser customers are paying from own pockets. While, the cost of business meeting or business customers is from company accounts and this makes a huge difference for our revenue management strategy.

Let us see how because of the business customers since the cost is coming to the company they are less price sensitive. And since in the laser customers, the cost is coming to my own pocket. Therefore, I am highly price sensitive. So, one is price sensitive customer, other is no sensitivity to the price. Whatever name you want to give, that is okay.

Revenue Management Strategy

- A fundamental of it is to make distinction between leisure customer and business customer. *Business Meeting from Company accounts. vacation from own pockets.*

Leisure	Business
Highly price sensitive	Less price sensitive ✓
Book earlier	Book later
More flexible to departure and arrival times	Less flexible
More accepting of restrictions such as Saturday night stayovers	Less accepting of restrictions

But, we are classifying the customer and on the basis of that we will have different classes of our tactical level. Laser customers, since they are price sensitive customer and generally we all know that we have this conception and reality also, that if I book early much in advance, if I want to travel in the month of July and this is the month of May if I book much in advance I will get cheaper tickets and if I book immediately if I am traveling tomorrow and book today I will get expensive tickets. So, since business customers are less sensitive to the cost, they generally book one or two days before the date of travel and these laser customers they book much in advance that is another difference between laser and business customers. Laser customers are more flexible of departure and arrival times. I will see that after two months I want to travel.

So, I will take that combination of departure arrival dates where I am getting the best deals. Best deal means the lowest charges for my ticket while business customers, it is a particular appointment on which you have to attend the meeting which you have to attend. So, you have less flexibility with respect to your travel dates, more these laser customers are more accepting of restrictions such as Saturday night stay overs etc. So, they as we already understood that since these laser customers are more flexible. So, they

are ready to accept different types of restrictions which is possible to enjoy more competitive pricing.

While these business customers they are generally not going to accept any kind of restriction again, because the money is coming from the company account not from the personal account. So, all these things are very interesting and we should understand the philosophical label differences between the laser and a business customers. So, now let us first talk of the booking control, which is simply a decision making activity based on your quota which is available for a particular class. So, it is the real time phase of revenue management, you have to take a call of accepting or rejecting. So, you can simply see that request comes it is received, then this request is checked with your quota system.

So, you have to check if seat is available yes except if it is no reject. So, whether seat is available that is a kind of question you process in this system and if the answer is yes you are going to accept the booking, otherwise you are going to reject the booking this is what booking control does. Let us see a very simple example, very very elementary example. So, there is an airline having different types of class and this particular airline receives a request for B class booking for three seats from this particular flight from Houston to Miami and current B class limit for this flight is just two seats. Now, since you have requested for three seats the quota is available for two seats.

So, there is insufficient availability therefore, the request is rejected. For example, now if the request is broken in two parts, one request initially you are making for two seats and then you are making a request for one seat. So, you will get this request accepted and then this request will be rejected. Now, it is up to you if you sequence your request in one to then request for one seat will be first accepted and the request for two seats will be rejected, because then you had only one seat available and you are requesting for two seats. So, it is the request how are you and as a customer I am not aware that how many seats are available, so that I can model or I can sequence my request, so that I can get maximum yes and since, I am making the request for 3 therefore, it is rejected because I have only 2 seats available.

So, that is what happening in the booking control. Now, interestingly you see that request came for 3 seats, I had 2 seats, I rejected the request because 3 is more than 2, but then there is no further request for B class seats. So, in fact these two seats will remain unutilized and as soon as the flight will take off it the capacity will remain unused and it will be perished. Then another interesting term we will like to introduce is allotment. So, we have to divide the bookings into available capacity into discrete chunks and allocate each chunk to a fair class.

Bookings are accepted in a class until the allotment for that class is exhausted. So, you are going to devote and this is the work of tactical level. And as we discussed that you can have dynamic allotment also. Now, let us see one example that 100 seats aircraft is using this system of allotment. Now, here we have different types of classes.

30 seats are given to B class, seats and class and fare. So, 30 seats are given to B class and the fare for each is 125 dollar. 45 seats are given to full fare rate that is M class with 200 dollar rate per seat and 25 seats are given to Y class with a fare of 560. Now, this is the original allotment and you see the total is coming 100. Now, two weeks before departure 25 B class bookings let us use a different colour and two weeks before, a 25 B class bookings, 45 M class bookings and 10 Y class bookings are accepted.

So, 80 seats are already booked two weeks in advance. Now, the remaining allotment we have to do and it is quite possible that since we see that M class has more demand, M class has more demand, I may convert some of the unused sheet of my Y class, some of the sheets from Y class to M class or I feel that should I give balance 5 sheets of B class to M class. That is where the revenue optimization will come into the picture. If I am converting B class seats to M class seat, there are chances of higher revenue. If I convert Y class seats into M class seats, it is going to reduce my revenue.

But, it is always possible that I may not have enough taker of Y class seat. Though fair per seat for Y class is maximum and but still I have 15% unused or 15 vacant seats in case of Y and therefore, you have this choice whether to convert these 5 seats from B to M or convert 15 Y to M, 15 Y to M will reduce your revenue. But, may also guarantee that no Y class seat remains vacant. Since, B class is a deep discount class, it is assumed

that there will always be taker for B class seats. But, it will be very interesting that now if a new customer comes, he will not have seats in M class which is a higher class, which is a class for 200 dollar per seat.

But, he can get a seat in the lower class seat, where he has to pay only 125 dollar. So, this is a kind of example which gives you multiple food for thought that something wrong is there. It is not a case of this allotment is not giving you maximum possible revenue. Because, if all 45 seats of M class are filled, you still have 5 seats available in the deep discount category and tomorrow if a customer comes for M class booking. So, you may ask him that I do not have any M class seat, you can take either a B class seat or a Y class seat, but in Y class seat he may have hesitancy because he has to pay almost three times

An Example

A 100-seat aircraft is being managed using allotments. Thirty seats have been allotted to deep-discount bookings (B-Class) with a \$125 fare, 45 seats to full-fare coach (M-Class) with a \$200 fare, and 25 seats to business class (Y-Class) with a \$560 fare. Two weeks before departure, 25 B-Class bookings, 45 M-Class bookings, and 10 Y-Class bookings have been accepted. The remaining allotments are 5 seats for B-Class, no seats for M-Class, and 15 seats for Y-Class.

Seats	Two weeks	Class	Fare
30	25	B	\$125
45	45	M	\$200
25	10	Y	\$560
<u>100</u>	<u>80</u>		

Handwritten notes: A blue arrow points from 25 in the 'Two weeks' column to 5 in the 'B' class row. Another blue arrow points from 10 in the 'Two weeks' column to 15 in the 'Y' class row.

of current fare 200 to 560, but he will be happily taking a seat in the lower class.

He came with this mindset of paying 200 dollars, but actually, he is getting a seat for 125 dollars. So, you can easily understand that this situation is not going to give you optimal or maximum revenue. So, this is the major drawback of the allotment system: we are still rejecting high-class, high-fare customers while lower-fare customers are being accepted, as I just explained. And therefore, in most revenue management activities where we have these applications of revenue management, we see that organizations use a concept known as nesting. By using this concept of nesting their inventory, they allow high-fare customers access to all the inventory available to lower-fare customers.

So, if you are a customer of a higher category, you need not worry only about the higher category; all the capacity available to lower categories or lower-fare categories is also available to you. So, this concept is known as nesting, and it is developed to avoid the situation where a high-fare booking is rejected in favor of a low-fare booking. So, if you are looking for this M class, the booking control will say 'rejected' because you are the 46th in the list. So, the booking control will reject the M class booking, while the B class booking, which comes after the 46th request of M class—let's say the 20th customer—will be accepted. So, this is not easily understood, and you will not be able to digest this concept: how a high-class fare booking is rejected and a low-fare booking is accepted.

So, this concept of nesting will say that if capacity is available in B class and this 46th customer is coming in M class, this will not be rejected; it will be accepted. That is where the concept of nesting comes into the picture: for all high-fare situations, the low-fare bookings are always acceptable. So, in our subsequent videos, we will discuss in detail this concept of nesting. We will see how organizations are implementing nesting in a real environment. And therefore, when we talk about nesting, tactical revenue management is all about setting the capacities for different types of classes.

So, we have to determine which fare classes should be open, which should be closed for all products, in order to maximize return from a fixed set of resources. So, that is the important thing. One is whether you have B, M, Y, or more classes—that is one important decision you have to take. The second important decision is how many seats or how much resource you are utilizing in a particular class. So, these are the two important components of our tactical revenue management. So, one is capacity allocation, the second is network management, and the third is overbooking. So, when I say capacity allocation, that is how many—

How many customers from different fare classes should be allowed to book? That is one important decision component. The second is network management. How should bookings be managed across a network of resources, such as an airline hub-and-spoke system or multiple-night hotel stays, etc.? Because all these modern-day organizations are not standalone organizations; they are operating in a network system.

So, you need to see that, for example, most international airlines operate in such a way that—from India, let us say you talk of Emirates— Flights are departing from Delhi, Mumbai, Hyderabad, Chennai, Bangalore, etc. And all these flights are going to Dubai, where cross-docking is happening, and after the cross-docking, these flights are going to London, New York, Frankfurt, São Paulo, and so on. So, in this way, you are not only managing the capacity of this particular sector—Delhi to Dubai or Mumbai to Dubai—you have to see that you are managing the capacity of the entire network: Delhi to Dubai and Dubai to Frankfurt, or Dubai to São Paulo, or Dubai to London. So, in this way, this is another very important thing: you cannot discuss capacity allotment only for limited sectors or for a limited standalone organization, because then it would be much easier.

But you have to see this capacity allocation in light of this entire network management. And the third important component is overbooking, because if I am booking for this particular sector, there will always be some cases of no-shows. Some of the customers who book ahead of time may not be able to turn up at the time of actual service. There may also be some last-minute cancellations. So, most systems do some kind of overbooking as well.

For example, if we are doing admissions for any course and there are 100 seats, we offer admission to, let us say, 120 candidates because we know there will be some cancellations even after they take the admissions. So, to fill the seats completely, we do some overbooking. But how much overbooking should we accept? Otherwise, if there are only 100 seats on a flight, I do overbooking anticipating that this many cancellations will occur. I have past data on cancellation trends as well.

But it may happen that I overbooked 10 customers. But there are not enough cancellations; 10 cancellations did not occur, or there were no cases of no-shows. So, let us say all 110 passengers came for boarding; then there will be a challenge for the airline on how to accommodate those 10 overbooked customers, and nobody knows who those overbooked customers are. Therefore, you should carefully decide how much overbooking to do; otherwise, it will incur additional costs, as the airline will have to compensate customers who could not travel due to overbooking. So, these are the three

very important components: capacity, network, and overbooking for your tactical revenue management.

So, with this, we saw some of the important terminologies you can say, like booking control, allotments, nesting, etc. And using these things, we will see some practical cases of revenue optimization in our next video. With this, we conclude this particular video. Thank you very much.