



Airlines Yield management System

Airlines Use case



Introduction

Yield Management System is the process through which an Airlines company tries to get the most revenue out of each ticket booking; in a highly competitive industry like Airlines it is imperative to know that sweet spot where company can get most with least probability of losing out on the customer; The objective is to build an AI system which leverages different kind of data and machine learning models to come up with that price which is attractive to customer and profitable to airline.

Factors affecting tickets pricing

Inflation, employment rate, interest rate, crude oil price

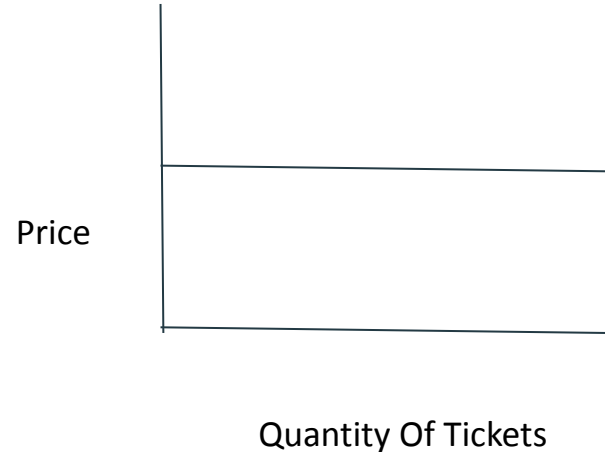
New offers from competition, new players, tie-ups, technology change

Events(Holidays, weather)

Customer(demographic, flying patterns, payment ways)

Customer's demographic, flying patterns, payment ways

Airlines has to sell as seat as possible and at the same time for the maximum price. It's inefficient if an aircraft takes off almost empty with a couple of expensive tickets sold. And it's also inefficient to occupy the entire aircraft , but for the lowest cost per seat. That's why airline revenue management requires a balancing act between finding the highest price and filling as many as seats possible.



Types of customers: Generally, Airlines divide customers into two major groups: leisure and business travelers.

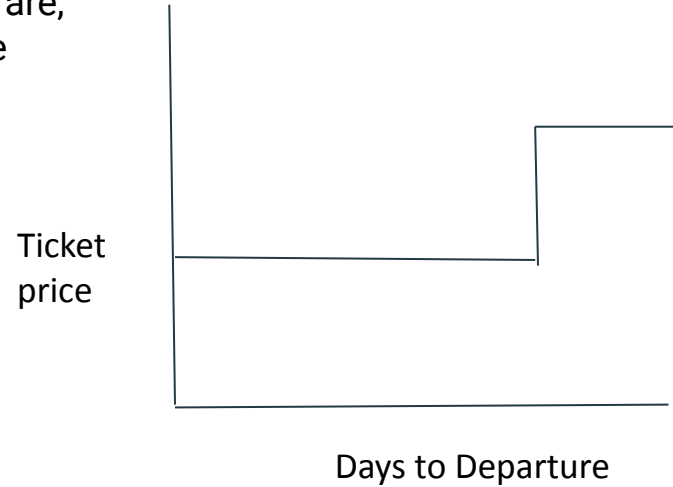
Leisure traveler are sensitive to prices and plan their trips in advance sometimes months before departure. So you have to sell cheaper tickets to leisure travelers and do it earlier. And, this will help to fill more tickets.

Business traveler, on the other hand, need more flexibility and usually book days before departure.

We can increase the prices as the departure date approaches to efficiently capture the business segment of the customers. As the fare is employer-funded, business travelers don't care as much about the cost.

if we look at general, smoothed-out trend of any air fare, you will see this logic in action. The fare remains the same for months before a departure and then it starts moving in multiple, distinct steps. These purchase discount requirements.

If you fail to purchase a flight at least, say, two weeks in advance, the minimum fare remaining will get considerably higher for the same service class, whether it's economy, business, or first class. Usually a flight has multiple step increases as fare rise towards the departure date. This difference between fare help divide leisure travelers who spend less and business travelers, ready to pay more.



This strategy has a problems because everyone will try to buy the tickets as soon as possible but once they miss the dates to book tickets they will not buy tickets.

What we can do is we can utilizes another strategy that adds more peaks and valley to the tickets booking graph.

Imagine there are fifty economy class seats on the aircraft for a given flight. Even though these seats belongs to the same class, an airline doesn't want sell all of them at the lowest cost, nor at the highest cost.

Airlines can divide all those fifty seats int multiple fare groups or buckets. For instance there will only be five seats at the lowest fare with minimum services and smallest bag allowances.

Once these five seats are sold out, the fare buckets should be closed. You can no longer purchase a seat at the bargain base price.

But forty five seats with more services and bag allowances are still available at a higher cost in other buckets. They start filling up and then gradually close. So the prices go up no matter what, as travelers purchase seats from higher-fare buckets until the aircraft is fully packed. If the only price direction is to up as buckets filled,

this would mean a lot of lost price sensitive customers for airlines. In this case travelers would just have to purchase flights as early as possible.

So, we should not adopt to increasing fare price strategy. Beside gradually increasing prices, airlines should track demands. How faster those buckets get filled?

**30 tickets
250\$/**

**15 tickets
150\$/**

**5 tickets
5\$/**

Demand based motion

Imagine we have sold five seats from the first buckets in a week, but only a single traveler purchased the seats from the second bucket next week. If fewer people start buying out seats after a bucket or two are closed. The lower fare buckets may be reopened again to invite more price sensitive customers. Some of the seats from the higher priced buckets would then move to the reopened lower bucket. And this works in the direction as well. If the aircraft start filling up too fast, The airline may close low-fare buckets to get more revenue or even to prevent some people from buying those seats. Because there must be some room available for business travellers who will purchase their flights at a much higher cost right before departure

Advance purchase discounts and fare bucket motion are the two main drivers that complements each other and can cause most of the price changes at airlines. And because demands dictates pricing logic, it may seem opaque to the average traveler,

Other factors that can impact dynamically changing prices The fares within buckets can also change in reaction to various external conditions. If the cost of fuel increases, this may cause the entire base fare to rise as well. In addition to this, airlines can consider seasonal trends. If there are more people who fly for summer vacation to some destinations the set of fare will be adjusted to this trend. This also happens if the demand is likely experience an internal increase at a specific destination. For example, a rock festival will trigger the ML model to manually increase fares as higher demands is anticipated for these dates. And finally if some low cost airlines or other competitors opens a new flight, the competing flights will gets cheaper, even at traditional airlines. This is how dynamic pricing should work.

The past understanding of one traveler being price sensitive, while the other is not is very limited. There are many more nuances, an airlines should realise that. But the distribution model in which travelers purchase tickets from travelers agencies puts blinders on carrier, leaving them guessing exactly what their customers looks like. They mostly judge by demand and time of purchase. On the other hand, by directly interacting with customers, airlines can get a more granular and detailed view of the actual person looking for the flight. What are the flights they are looking for? How often do they check prices? which links do they click on? If airlines managed to tap into this data, they could use more Advanced AI systems that define personalised prices.

Airlines Pricing System

