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Airline Revenue Management in an Ancillary Revenue Age

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October 24, 1978, marked a watershed event for airlines. President Jimmy Carter signed the Airline Deregulation Act into law, forever altering the competitive landscape of the industry.

The years that followed were tumultuous. New carriers entered the market, beloved brands vanished and airlines felt competitive pressures more strongly than ever. Although deregulation freed carriers to compete more directly, it did nothing to lower the industry's onerous operating costs. Carriers had to adopt fresh, innovative strategies just to survive in this new deregulated world.

A strategy for survival

One of the most important innovations was the development and refinement of revenue management (RM) practices. Put simply, RM is a series of tactics that airlines use to increase and maximize revenue. It consists of several related organizational components, the two most critical being pricing and yield management (YM).

While pricing has an intuitive objective, YM serves the more esoteric function of controlling the inventory of the airline's main product: seats on a flight. Using advanced forecasting methods and optimization algorithms, airlines can differentiate their own products by reducing spoilage (through overbooking) and by tailoring the availability of lower-fare seats to the expected pattern of demand (discount-class allocations). The algorithms have been refined and expanded over time, and the impact of RM on an airline's profitability and revenue has kept growing. As long as revenue from fares was the dominant source of an airline's income, it remained a good surrogate for profitability—the better measure of performance.

Ancillary revenue: The new normal

Fast-forward to the current era of ancillary revenue. Today, the dominance of fare revenue is receding as airlines rethink their approach. Initially developed by low-cost carriers as a way to offset their deeply discounted fares, ancillary revenue has now been embraced enthusiastically by carriers of all sizes in a historically low-margin industry.

Carriers began collecting fees for checked bags, meals, preferred seats, blankets and so on. These ancillary sources of revenue came from relatively simple products that could be offered to all customers.

However, as airlines learned to adopt the concept of customer-centricity from retail and other industries, they started making targeted offers to individuals based on their personal preferences and buying habits. Improved product offerings include hotel accommodations, tour packages, rental cars, consumer products, financial services and more. These custom perks represent higher revenue potential per sale than the simpler ones described earlier, but they have a lower likelihood of acceptance and purchase.

Unlike basic ancillary products such as meals and blankets, however, these richer offerings are perceived positively by recipients as customized, high-value benefits, as opposed to irritating fees for services that used to be complimentary. As a result, even airlines with reputations for quality service have been able to increase their share of ancillary revenue collection.

A revenue management model

To illustrate how ancillary sales affect RM, take a look at this simple example of traditional RM/YM. Let's assume that a carrier sells three different economy cabin fare classes on a route:

> **Y** — Full-fare economy: **$200**
> **Y1** — Seven-day advance purchase: **$190**
> **Y2** — Fourteen-day advance purchase with Saturday stay: **$150**

The YM system sets an overbooking level for the flight and sets the fare-class sales levels in a nested fashion. For example, all seats are available for sale at the unrestricted Y fare, fewer at Y1 and fewer still at Y2.

So far, the YM system is doing its job: setting inventory levels to maximize the revenue generated on the flight based on fares, booking forecasts, cancellation forecasts, expected boarding rates and go-show rates. However, the potential to earn ancillary revenue hasn't been factored into the calculations.

We can predict the revenue generated from fares accurately, but ancillary revenue is another story. It's highly variable and influenced by a host of factors, including:

- Product or service offered
- Timing of offer
- Channel of offer
- Intensity of marketing effort
- Individual passengers' proclivity to buy

In this model, it's highly likely that the number of seats allocated for sale in discount classes based on fare revenue projection will fall short of maximizing revenue on a flight. Why? Because it ignores potentially higher ancillary sales in the more deeply discounted fare classes.

To maximize revenue, an airline may wish to offer more seats to passengers paying a lower fare if there's higher potential for selling ancillaries to those customers than to passengers in a higher fare class.

Segmenting the buyers

Let's continue with our example above, but now we'll consider the likelihood of ancillary purchases among the following buyer segments:

Business travelers	Leisure travelers (individual)	Leisure travelers (families)

These three types of travelers have their own unique buying behaviors and preferences for fares and ancillary products. Consider the following profiles:

1. Business travelers
- Usually book in Y ($200), occasionally in Y1 ($190)
- May pay to check a bag ($30) if not a premium member of the airline's loyalty program
  - Probability of not being a member of the loyalty program: 0.1
  - Probability of checking a bag if not a loyalty member: 0.2
  - Probability of earning $30 in bag-check revenue is 0.1 x 0.2 = 0.02
  - Other ancillary offerings have negligible likelihood of sale

Conclusion: The maximum revenue achievable from a business traveler is $230. However, the probability of earning the higher revenue is small (0.02).

2. Individual leisure travelers
- Equally likely to book in Y1 ($190) and Y2 ($150)
- Probability of checking a bag in either fare class: 0.5

- Probability of accepting a hotel offering from the airline ($100 revenue for airline): 0.1

Conclusion: The maximum revenue achievable from an individual leisure traveler is $320 ($190 fare, $30 bag check, $100 hotel royalty). The likelihood of earning this amount is 0.05.

3. Family leisure travelers
- Most book in Y2 ($150), the rest in Y1 ($190)
- Probability of checking a bag: 0.8
- Probability of accepting a car rental offering from the airline ($50 revenue for airline): 0.2
- Probability of accepting a theme-park ticket offering from the airline ($100 revenue for airline): 0.4

Conclusion: A leisure travel family member booked in Y2 therefore has a probability of 0.064 of generating a total revenue of $330 ($150 fare, $180 in total ancillaries).

A Y2-booked leisure passenger has a greater likelihood of delivering more revenue to the airline ($330 with a likelihood of 0.064) than a Y-booked business traveler ($230 at a likelihood of 0.02).

Although the numbers above are contrived, it's clear from our example that closing out a lower fare class while neglecting ancillary revenue-generating potential can result in suboptimal revenue performance for that flight.

Capitalizing on revenue management

Recognizing the benefits and opportunities presented by RM practices is the first step—capitalizing on that potential by refining your RM practices is a much more complex undertaking.

In reality, individual customers can't be categorized into only three monolithic segments. Many more ancillary offers can be made and promoted (or deemphasized), and buying decisions will not always be independent as assumed by the probability calculations above.

Some airlines are addressing this issue by adopting dynamic pricing strategies in which prices are permitted to fluctuate based on certain conditions. These more flexible strategies allow carriers to treat class-based fare allocation levels as fuzzy boundaries instead of rigid rules.

In addition, a great deal of research and experimentation are under way in customer choice and utility modeling. This work may lead to the ability to rank preferences more accurately and enable more intelligent decisions on pricing and availability.

These developments promise a significant change to RM practices. In the future, airlines should be able to model customer behavior better to promote revenue and growth.

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