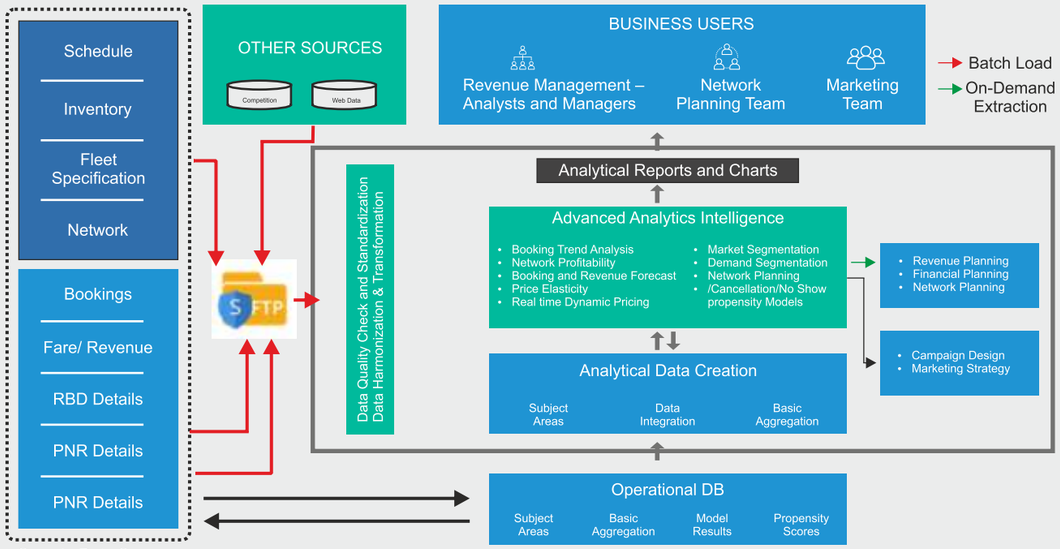
ITC INFOTECH

Business-friendly Solutions

Enabling Revenue Management with Predictive Capabilities

Illustrative stack of advanced analytics solutions for Airline RM team to address specific business challenges, in line with market dynamics

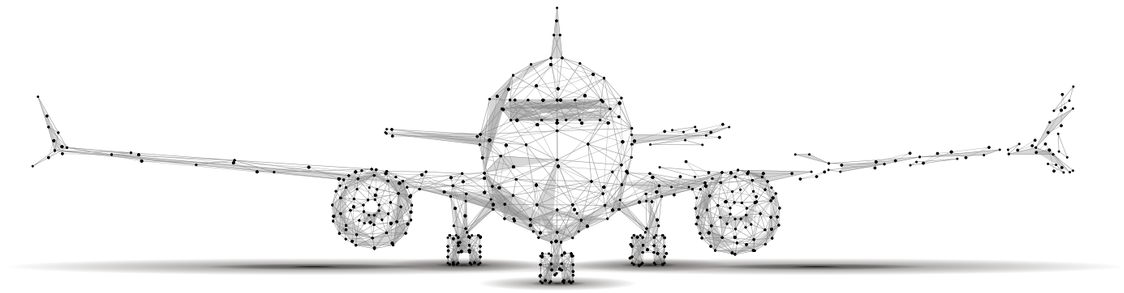


Executive Summary

An Airline Revenue Management (RM) function uses off-the-shelf product as a core application. These products offer a varying degree of advanced analytics capabilities. One common thread across most core RM applications is that they are a black box to the very teams they are supposed to help achieve results.

RM cannot work in isolation. There is ever growing inter-dependability amongst RM and Marketing, Loyalty, Sales & Distribution. To meet such expectations RM relies on multiple sources of data, over and above its core application.

As demands from RM grow, the function needs customized solutions that match the pace and intricacies of an evolving business landscape. There are limited products in the marketplace, at an affordable investment, which meet this requirement.



Introduction

The airlines industry is duly credited with the invention of the Revenue Management (RM) function. This is because airline services are perishable in nature, since with every departure, any unsold seats point to lost opportunity. The lost opportunity started RM, both as a business practice, and as a dedicated function.

Airline RM functions traditionally rely on one core application for RM. It tends to focus on the puzzle of optimizing market demand and airline pricing (or airfares). With Airline Retailing gaining foothold, RM had to align with a new commercial strategy, and to facilitate offer and order management through NDC framework.

The Low-Cost Airline business model is a mainstay of the aviation ecosystem. As a result, increasingly airlines find that seats and fare are commoditized. An invisible glass ceiling on airfares constrains the airline's ability to maximize revenues. Ancillary revenues are gaining significant importance in the commercial strategy, with airline selling from seat-related onboard services to holidays, insurance, and event tickets!

While the complexity of the airline offerings has built up, airline business remains highly susceptible to external factors such as economic downturns, war/ conflicts or epidemics. Demand cycles quickly shift gears pushing RM teams to their limits while delivering an optimized revenue to Executive Management.

Airlines' ability to invest in a next-gen, off-the-shelf RM product is shrouded with questions related to the relevance of the features and functionality vs ROI within a specific time frame (preferably on a medium term, to avoid delay in tapping demand cycles)

Trends

Over the last decade or so, the airline business has undergone significant transformation. From selling seats across Cabin Classes at a price point, airlines are now focused on selling a differentiated experience. An experience that covers seat (in a cabin class), at a price point, along with a host of other ancillary offerings.

The core of RM is turning more complex over the last decade or so. RM is managing own inventory, and also bundling or retailing partner offers! RM is expected to collaborate with Marketing/ Loyalty teams to harness customer intelligence and personalised offers.

In our experience, select leading airlines are redefining conventional pricing guidelines. Instead of always offering lowest airfares first, can one potentially offer fares basis a customer's propensity to pay!? This fundamentally different approach is rediscovering how RM can enhance its ability to charge the highest possible fares.

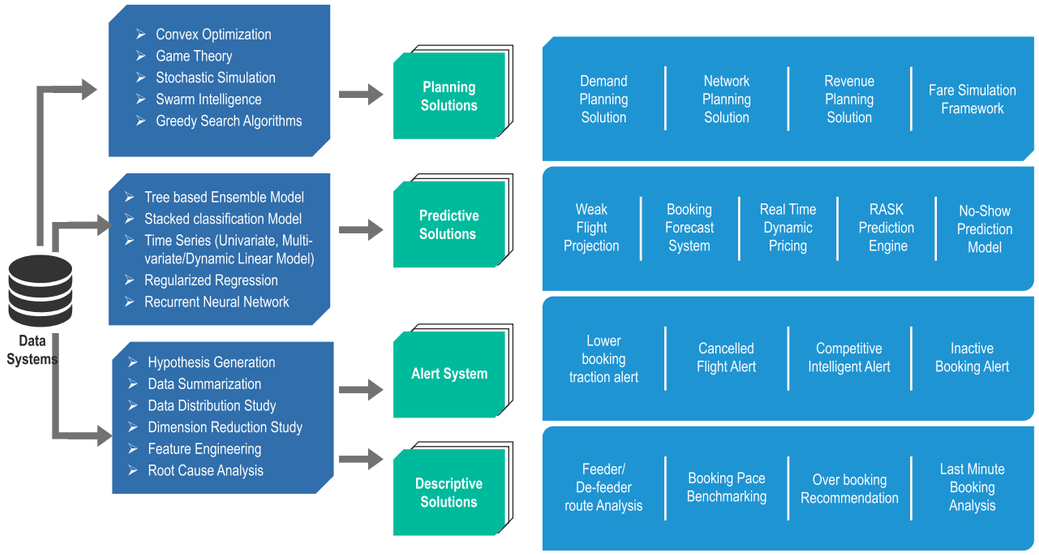
Airlines RMs are now looking beyond the optimization of inventory and pricing. Not ignoring it, but balancing it along with many other influential and relevant factors. McKinsey, in its report –How airlines can gain a competitive edge through pricing (2017), brought forth a remarkable and new paradigm in total revenue management. In essence, attribute-level customization is the best form of creating smart RM model to create potentially infinite number of pricing points. The bigger challenge to solve is that airlines are expected to develop such tools in-house, by investing in data science capabilities, after improving data visibility. Not an easy task for the RM team, who are busy tackling daily market upheavals!

Our Solution

The key to our solution lies in an old adage – "one size does not fit all". The business model, size of the business, fleet composition, services to sell, geo location, competitive landscape, and many more such factors influence RM's deliverables. Each RM team therefore deserves its own custom-stack of weaponries to grab demand.

The airline business is rediscovering itself to offer a personalized experience to its customers. In the same line and spirit, airline RM (which is fundamental to an airline commanding an optimal price) should be 'enabled' by a customized solution suit, one that helps the RM team meet the multitude of demands that the Executive Management expects it to meet.

Here is a conceptual articulation of the proposed solution



Our analytics landscape encompasses descriptive, diagnostic, predictive and prescriptive modules to assist business stakeholders in efficient decision making for better yield management and inventory utilization that contribute to improved network profitability.

This analytics layer consists of predominantly advanced analytics accelerators that propel RM capabilities in synthesizing data and creation of relevant and timely inputs. Subject to analytical maturity of the airline or RM function, we suggest one to include custom diagnostic capabilities too.

At the heart of such an analytics layer is Domain-led Data Science crafted algorithms. Data Science (DS) drives the core of this solution suit. It enables RM with Predictive/ Prescriptive capabilities. Self-adaptive machine learning algorithms are developed to capture market volatility, competition dynamics and passenger behavioural trend. These algorithms are intertwined with exploratory domain insights to improve usability for the business stakeholders. Ensemble framework leveraging the advantages of different statistical and mathematical models have made the predictive engine robust against business complexity and data variability.

However, there are no standard algorithms that the DS team has to configure for RM of any and every airline. The real challenge for DS is to assess the business landscape, data composition, sources and eventually, the business problem that needs to be solved! Pricing analytics solutions require a comprehensive market study about the competitions' fare movements and hence, a game theoretic approach - interlaced with convex optimization -has been embraced to capture the elasticity. Demand forecasting and booking projections are coupled with pricing engine to better estimate the inventory utilization patterns in the future.

To further improve the accuracy, course corrective actions from the RM team are fed into the analytics engine through different, recurrent neural network architecture. Improvements in terms of yield and load factor through such algorithmic solution suite require extensive domain knowledge. The DS team needs to be aligned with the airline domain. Only then they are able to assess what needs to be tweaked while catering to an RM in a low-cost model in a matured market, vs. RM for a legacy, full-service model in an emerging market! For example, Europe offers an entirely different aviation business landscape compared to the Indian subcontinent or SE Asia. Domain has a critical role in identifying business drivers, helping the DS team prioritize business challenges, and helping relate to possibly diverse and yet relevant data sources.

Our domain-led algorithmic RM solution stack provides strategic guidelines on how to manage inventory optimally and improve RASK for a better network profitability. Different alert systems aid the marketing and RM team in undertaking strategic decisions like differential pricing which ultimately translates to better management of booking velocities. Booking pace bench marking solution will help the team in terms of correcting lower fare classes to improve revenue and minimize CASK.

Risks

Amidst the complexity and dynamism that are intrinsic to airline industry, Airline RM teams would strive to command an optimal price for the services, and the experience, the airline intends its customers to cherish. Airline / Commercial Management should periodically review, and restructure, RM tools/ solutions stack to amplify RM team's ability to be ahead of the demand curve. Here are key considerations that one needs to ponder upon:

- **Selection of Core Product** – Options for RM core products are scouted for, not just at the launch of operations, but also when a business model undergoes significant change. We have observed that selecting one core RM product over the other is a complex exercise. The good part is that with advanced analytics, RM team is better poised to analyze and target demand. So long as core RM product comes with select minimum functionalities, RM team would be in good control of the proceedings.
- **Customization of Product** – We have observed that time taken for customizing an off-the-shelf RM product tends to vary compared to initial agreed plans (and typically on higher side). In the interest of grabbing market opportunities, RM team can rely on data science led analytics for better fitment with evolving needs. It would minimize dependence on standard reports and dashboards from the product company.
- **Core Product Roadmap** – There may be every likelihood that the roadmap for feature-functionality enhancements of a core RM product may differ to the way Airline RM intends to evolve its capabilities! It would be prudent to use custom-made technology tools to bridge the gap in functionalities.
- **An agile methodology –** Given that airline business is susceptible to various factors, such as economic cycles, or capacity consolidation such trends tend to open up opportunities, and RM team should adapt quickly to make the most of business landscape. RM team should be given tools that it can control better, and customize quicker, to meet the newer challenges.

Conclusion

RM is a primary function for airline business to command the best price for the services and experiences that an airline offers. The function has to delve deeper than examining its own inventory and pricing, and tap multiple data sources (internal or external to airline IT landscape).

In order for the RM team to succeed, it needs to be enabled with relevant and timely insights. Over dependence on core application's ability to deliver in a dynamic environment, may in fact constraint RM from tapping revenue opportunities.

Creating an advanced analytics layer around core RM application, which is domain-led, customized to the airline's business model and competitive ecosystem, is the best option for Executive Management in setting up a winning strategy!

Data Science led predictive and prescriptive capabilities are useful to be ahead of the curve in terms of demand prediction or passenger behavior.

About Authors

RAHUL CHOGLE

Rahul is a Global Practice Leader for Airlines Consulting Team at ITC Infotech. He has nearly two decades of experience in the travel industry. He has spent over 12 years at a leading 5-star, global airline, managing various aspects of aviation business. Rahul has been a part of ITC Infotech for six years and over the years, he has spearheaded the creation of domain-led capabilities and solutions. He regularly engages with the executive leadership team of ITC Infotech's airline clients to deliver business impact by partnering with them in their Data/Analytics and digital transformation journey.

DEBAYAN BOSE

Debayan leads the Advanced Analytics team for travel and hospitality at ITC Infotech. He has worked across various airline functions like network planning, revenue management, marketing, flight ops, among many others, designing algorithmic business strategies using mathematical models. Businesses come to him for his expertise in recasting business challenges into mathematical models that offer optimized and targeted solutions for growth. He has around 8 years of industry experience in solving complex business problems across various domains like retail, CPG, manufacturing, BFSI and Airlines.

Debayan holds a Master's degree in Statistics and Operations Research from Indian Statistical Institute, Kolkata.

About ITC Infotech

ITC Infotech is a specialized global technology solutions provider, led by Business and Technology Consulting. ITC Infotech's Digitaligence@work infuses technology with domain, data, design, and differentiated delivery to significantly enhance experience and efficiency, enabling our clients to differentiate and disrupt their business.

ITC Infotech is a fully-owned subsidiary of ITC Ltd, one of India's foremost private sector companies and a diversified conglomerate.

www.itcinfotech.com | Email: contact.us@itcinfotech.com