Lufthansa Systems

Why digitalize the process flow of airport and en-route charges?

The need for Airline Route Profitability calculation

01. Abstract

01

Standalone solutions for airport and en-route charges tend to be incompatible with ERP solutions such as SAP or Oracle, holding back Airline Route Profitability applications. Yet calculating Airline Route Profitability precisely is the key to market leadership, as regional markets merge into one global market where competition heats up and market share allocation follows the Rule of Three and Four.

To become one of the leaders, an airline may

- grow faster than the industry, thus taking on more risk, or
- wait for faster growing, riskier competitors to default.

For example, Goldman Sachs became No. 1 in the investment banking world because all of its older, bigger rivals went bust.

02. Global market concentration: The Rule of Three and Four or "Gibrat's Law"

When it comes to market concentration in saturated markets, the Rule of Three and Four states that three to four competitors will dominate, and that any of them will have twice the market share of the next biggest competitor. In many regional airline markets, market concentration is advancing towards that final stage, while the European market is currently more fragmented than other markets.

With regional markets merging into one global market, the Rule of Three and Four will apply to the global airline market in the decades to come. Possible government intervention may dilute the effect but not offset it.

Lufthansa Systems consultants assume that the three or four leaders will include one Gulf airline, as Etihad and Emirates are likely to merge and use lower fuel cost and fees at their home base as an advantage. A second airline will be US American, while the third airline will be Chinese, and Lufthansa will be number four.

To finance future growth, an airline may

- increase revenues through seat load factors, using big data to personalize offers,
- increase the yield (revenue passenger kilometer) through an optimized state-of-the-art Revenue Management system, since increasing the yield has a higher leverage for improving the profitability than reducing costs, or
- reduce expenses through a more accurate Airline Route Profitability calculation based on 'flight order' (a 'flight order' is an order for an aircraft to fly from airport A to airport B on a certain day).

The Rule of Three and Four

A stable competitive market never has more than three significant competitors, the largest of which has no more than four times the market share of the smallest.

The conditions which create this rule are:
1) A ratio of 2 to 1 in market share between any two competitors seems to be the equilibrium point at which it is neither practical nor advantageous for either competitor to increase or decrease share. This is an empirical observation.
2) Any competitor with less than one quarter the share of the largest competitor cannot be an effective competitor. This too is empirical but is predictable from experience curve relationships.

03. Big data maximizes seat load factors and revenue – at the expense of risk and IT cost

03

Many airlines are investing in big data to increase seat load factors via personalized offers. If one airline offers personalized discounts, it may work. If all airlines do it, it cannot work.

Historic data shows that airlines experience a ten-year industry cycle caused by delays between capacity demand and supply. Personalized prices dampen capacity swings and increase expected profit – in return for higher operating leverage, higher profit volatility, higher risk, and higher capital costs:

$$Operating\ Leverage\ =\ \frac{Revenue\ Passenger\ Kilometer\ x(Price-Variable\ Cost)}{Rev.\ Passenger\ Kilometer\ x(Price-Variable\ Cost)-Fixed\ Cost}$$

Source: accountingtools.com, 2017

In airlines, operating leverage is high due to high fixed costs per available seat kilometer and the ten-year industry cycle. If an airline adjusts prices faster to keep demand constant, it increases operational leverage even more. This changing leverage increases profit, risk – and capital costs.

If an airline offsets higher profit with higher capital costs, the airline has a lower shareholder value despite upfront investments in big data. This is the essence of an MIT simulation study on airline profit cycles, the results of which were approved in the most recent study carried out by the German Aerospace Center (DLR).

The disruptive activity in this sector can be seen in another prominent industry – banking. Investment banks ignored studies that technology was "creating value for customers and destroying profits" to their cost.

⬈ Operating Leverage

Operating leverage is a measurement of the degree to which an airline incurs a combination of fixed and variable costs. An airline that generates revenues providing a very high gross margin with fewer fixed costs and variable costs has much leverage. The higher the degree of operating leverage, the greater the potential danger from forecasting risk, where a relatively small error in forecasting sales can be magnified into large errors in cash flow projections.

Most of an airline's costs are fixed costs (about 60–70% of all cost). Considering their low profit contribution, this means that as long as airlines earn a substantial profit on each passenger and sustain adequate revenue volume, fixed costs are covered and profits are earned. It is important to note that airlines pay for flying regardless of the number of passengers on board, which means, as the number of flights increases, the total operational costs per available seatkilometer increases by a lower percentage. Airlines therefore have a high operating leverage.

04. Airline Route Profitability: reduce expenses and reorganize routes at low IT costs

Airlines' Route Profitability calculations use the opposite approach, increasing operational leverage and dissecting the contribution margin per flight order to keep variable and fixed costs under control.

The key is to identify loss-generating routes or products earlier at lower IT costs. Future Airline Route Profitability solutions may use SAP or Oracle, as about 120 airlines have implemented SAP. Integrated solutions are also required to minimize interfaces and the future cost of upgrades, thus guaranteeing seamless data flow.

According to a recent market study carried out by Lufthansa Systems consultants in Norderstedt, no more than half a dozen airlines use ERP for accurate Airline Route Profitability based on a digitized (or automated) data flow.

Many airlines refrain from using ERP for Airline Route Profitability because (e.g. in the case of SAP)

- they do not know how to use SAP CO-PA (Profitability Analysis) and
- the lack of an SAP solution for airport and en-route charges is a nuisance.

Of these 120 SAP airline customers, about ten have attempted to build an Airline Route Profitability solution, and about half of them may have succeeded – while incurring high IT costs for the SAP Industry Solution Defense (IS-DFPS) or the SAP Business Warehouse. Few of them are aware that SAP provides a component for profitability analysis (CO-PA) that can be used for Airline Route Profitability analysis and planning at low IT costs.

↗ ERP as competitive advantage

Of the 300 largest global airlines, 120 have implemented SAP, spending between EUR 25 and 65 million. While many airlines have recognized integrated information technology as a competitive factor in the industry and have thus enhanced their administration to implement ERP systems, many struggle to properly implement ERP solutions by saving on implementation costs and engaging so-called "experts" who do not have experience in the complex world of airlines. On top of this, ERP systems are made for the manufacturing industry, posing an even greater challenge to airlines' IT departments. Consequently, millions of dollars (and euros) have been wasted on improper installations. With the upcoming digital transformation of the industry ("Airline 4.0"), ERP will become an even more significant competitive factor, making its proper installation even more crucial.

05. Airline Route Profitability's bottleneck: airport and en-route charges

With Airline Route Profitability in SAP CO-PA, it is possible to assign all cost and revenue types to flight orders accurately at low IT costs – except airport and en-route charges. To write revenue into SAP, there are Revenue Accounting systems. To write fuel cost per flight order into SAP, accurate fuel management systems are on offer. For indirect operating costs, administration costs and marketing costs, there is SAP CO-OM (Overhead Management). That leaves airport and en-route charges to be assigned to flight orders in SAP.

To integrate a subledger for airport and en-route charges into SAP, the subledger must use SAP master data from the same database. Any other solution leads to two dozen interfaces out of and into SAP, incessant accounting differences, and high IT costs. SAP standard products (SAP MM, the Ariba procurement cloud, S/4 HANA) are not sufficient.

SAP MM (Materials Management) has a service management component that cannot tackle the complexity of airport and en-route charges. SAP Ariba, a procurement cloud, sits on top of SAP MM and has even fewer functions, while SAP S/4 HANA, which replaces SAP ERP, has not yet resolved the issue.

To integrate airport and en-route charges into SAP, an airline must either

- develop its own SAP application for charges, or
- extend SAP MM with Business Rule Framework plus (BRF+).

⬈ Integration of back-end processes

While the world talks about NDC and ONE order, it is important to remember that digital transformation comprises additional issues which are as important as an easy-to-use-mobile sales tool and colorful website. This touches everything from ticket purchases to the recognition of airport-related services and their (automated) reconciliation, posting and payments. The last part in particular – proper, automated invoice reconciliation – seems to be a challenge due to the complex and complicated formulae airports have created for their services. Governments are equally creative when it comes to developing complex formulae for en-route charges which are difficult to replicate in IT solutions, thus creating high efforts for automating purchase-to-pay processes.

06. Recommendations

Airlines should invite IT experts who know airline processes by heart for implementing a tailor-made route profitability based on standard (SAP) modules. Any SAP solution for Airline Route Profitability needs a subledger for airport and en-route charges on the same SAP system. To feed charges into SAP, Lufthansa Systems offers both

- the knowledge to redesign the charge legacy system for S/4 HANA, and

- the concept for a SAP MM extension with BRF+.

While SAP has been mentioned here as an example this also counts for other ERP solutions.

Timeline for ERP-Route Profitability implementation

No.	Project Steps	Duration	Months									
			1	2	3	4	5	6	7	8	9	10
1	Definition of company and IT strategy	0,5 m	★									
2	Business Process Reengineering	2 – 4 m		★	★		★					
3	Mapping of processes to ERP Standards	1 – 2 m					★					
4	Interface definition	1 – 1,5 m					★					
5	Specification or adjustment of non-mapped processes	1 m					★					
6	Customizing, Migration and Testing	2 – 4 m							★	★		
7	Transactional database, Data warehouse	2 m							★	★		
8	Management Information System	1 – 2 m								★	★	
9	Final test and cut over	1 m										★

m = Months   ★ = Milestone

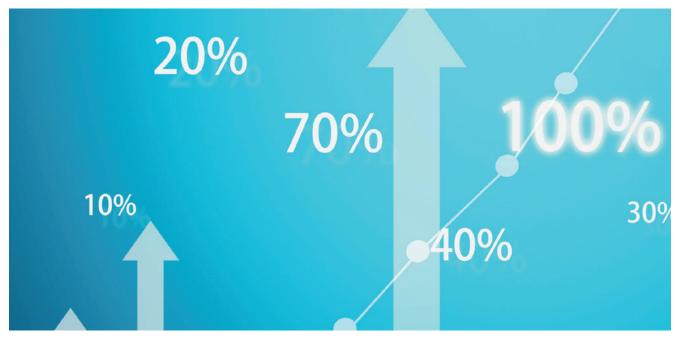*Source: Kristian Cabanis*

07. Conclusion

07

Digitalization may be the current focus of the average IT department, but even things that sound quite simple – such as cost monitoring – are complex for airlines and can be the difference between being world-class and loosing out entirely. Although the European airline market is currently quite fragmented compared to North America, the Rule of Three and Four will also apply here sooner or later, shaking out weaker market players.

Big data may help to increase revenues and profits in the short term, but a well-implemented route profitability calculation (supported by a state-of-the-art Revenue Management system) will be required in the long run to minimize losses, improve profitability and reorganize routes at low IT costs. The bottlenecks for an exact profit calculation are airport and en-route charges, which require a complex and well thought-out implementation of cost accounting solutions.

A well thought-out implementation of a cost accounting solution will have a beneficial, second effect: it supports the reconciliation of the complex airport and overflying invoices by largely automating the process.

Airlines have spent millions of euros implementing ERP systems to do exactly this, but are still struggling to create a completely automated cost reconciliation process due to their failure to employ airline process experts with sufficient IT experience.

Source: 123rf.com

08. Background

Lufthansa Systems GmbH & Co. KG is one of the world's leading providers of IT services in the airline industry. It draws its unique strengths from an ability to combine profound industry know-how with technological expertise and many years of project experience. Lufthansa Systems offers airlines a unique range of products covering all of an airline's business processes – in the cockpit, in the cabin and on the ground.

The company offers its more than 300 airline customers an extensive range of successful and in many cases market-leading products for the aviation industry. The innovative IT products and services in this portfolio offer customers a wide range of economic benefits while also contributing to improving efficiency and competitiveness. In addition, Lufthansa Systems also supports its customers both within and outside the Lufthansa Group with consulting services and the experience it has gained in projects for airlines of every size and business model.

Kristian Cabanis is active in the airline industry since 1995 – starting as group controller responsible for Cost Accounting in airline catering in Hong Kong and Bangkok for LSG SkyChefs. This was followed by several years in airline consulting, restructuring and interims management positions such as CFO under the wings of Lufthansa Consulting. Since 2015 he is responsible for a SAP based Cost Accounting solution at LH Systems which is its first product of its kind enabling airlines to digitize the whole process from budgeting to Route Profitability reporting to invoice reconciliation.

09. References

Albrecht, Thomas (2015)
"Business Rule Management mit ABAP: Geschäftsregeln mit BRFplus und SAP DSM" SAP Press

Breuer, Markus (2015)
"Strategy-Simulation: How to simulate the Corporate Value of Your Strategy with the CFROI model for market development scenarios" Lulu Press; ISBN: 9781326141769

Carrington, M.S. (1997)
"The Banking Revolution: Salvation or Slaughter ?" FT Prentice Hall

Cronrath, Eva-Maria (2017)
"The Airline Profit Cycle: A System Analysis of Airline Industry Dynamics" Taylor & Francis

Ehrlich, Lisa (2000)
"Goldman Sachs: The Culture of Success" Sphere

Henderson, Bruce D. (1976)
„The Rule of Three and Four"; Stern,C.W.;Stalk,G.jr (1998): 31–34

Lufthansa Group (2017)
"Forward Common Finance – Planning, Forecasting, Reporting. Cost object Reporting and Profitability Analysis for Hub Airlines." 16.02.2017"

Pierson, Kawika; Sterman, John D. (2013)
"Cyclical dynamics of airline industry earnings"; System Dynamics Review, Volume 29, Issue 3, pages 129–156, July/September 2013

SAP (2017)
"Business Rule Framework plus (BRFplus): Benutzerleitfaden Version 1.04.09 – 2017-01-30"

Steiner; Teixeira (1989)
"Technology in Banking: Creating Value and Destroying Profits"; Irwin Professional Publishing

Stern,C.W.; Stalk,G. (1998)
„Perspectives on Strategy from The Boston Consulting Group"; Wiley Publishing

162712