

Developments in information technology have allowed airlines to alter their methods of distribution and achieve savings related to pricing and revenue management, issuing tickets and revenue accounting. Yong Qiu examines how these savings have been made possible.

The savings in distribution, pricing, marketing & revenue accounting

A quiet revolution, triggered by sophisticated information technology, has been radically changing the world's airlines. This has reduced airlines' costs associated with inventory control, distribution, marketing, pricing, sales commissions, ticket issuing, and revenue accounting. These reductions have allowed airlines to keep up with the drop in gross yields that have followed increased levels of competition. The way in which each of these reductions has been achieved, and their effects, is analysed here.

Inventory control

So far many airlines, most of which are small operators, have relied on inventory control systems (ICSs) provided by specialised information providers. With the service outsourced, airlines only have to pay a transaction fee, rather than building their own ICS.

Among the various ICSs worldwide, SITA Reservations is the world's largest international, neutral multi-host system. It provides vital passenger reservations, inventory control and management information for over 105 million passengers per year. More than 150 airlines are using this service, but some airlines have joined together to build their own ICS.

There is a trend towards building ICSs that work with airlines' websites rather than using traditional systems. The open system with the assistance of Microsoft software, only needs an investment of no more than \$0.12 million. Despite the attraction of the savings from building an internal website, airlines have two concerns that make them hesitant: the security of the open system; and the past investment in their joint ICS.

Distribution channels

Four major global distribution system (GDS) providers, Amadeus, Worldspan, Galileo and Sabre, were the airlines' main distribution channels a decade ago. Amadeus and Sabre now dominate the European and North American markets.

Besides GDSs, airlines also used their own call centres to distribute and sell tickets. "In the past decade, the majority of KLM's sales was through travel agents, via GDSs, and a limited percentage was through direct channels, including our own reservation call centre," says Bart Vos, senior vice president distribution and e-commerce at KLM.

"In Flybe's case, the vast majority of bookings, prior to the introduction of our website in 2001, were made through travel agencies and our own telephone sales; probably 75% through travel agents and 25% via telephone sales," says Fred Kochak, director of revenue management at Flybe Airlines.

For many airlines, the percentage of tickets sold through GDSs has fallen as an increasing proportion are sold through the internet. The picture of the distribution channels was entirely different in developing countries. Chinese airlines in the late 1980s and early 1990s mainly relied on the computer reservation system (CRS) built by the CAAC to sell domestic tickets. The CRS is now owned by Travelsky, and Chinese airlines are charged for every sales transaction. In 2004 Travelsky handled reservations for 132.2 million passengers, 36.6% more than in 2003. Its revenue generated from ICS, CRS and airport passenger services (APP) reached \$0.12 billion.

Measuring this by Chinese airlines' individual market shares, every major Chinese carrier had to pay in the region of \$30 million for sales transactions. Chinese airlines' international tickets are

sold through GDSs, which charge them about \$4 per transaction, including per booked segment fee and support fee. On this basis, fees for international transactions will reach more than \$12.5 million per year for a major Chinese carrier. A minimal proportion of bookings for Chinese airlines are sold through websites.

Airlines have worked to reduce their distribution fees. "There is a per booked segment fee, AVS messaging fees, support fees, and one-off set-up fees involved with most of our GDSs," says Kochak. "Since some of our GDS distributors have realised the growing presence of internet distribution and the proliferation of the low-cost airline model, they have worked out pricing arrangements to meet airlines' needs," says Kochak.

The Internet makes airlines' efforts viable and allows them to sell their tickets through their own websites. "KLM introduced a website a few years ago, and the bookings started at a limited level. Now 8% of bookings are via our website," says Vos. "KLM has set a target that by March 2008 about 40% of sales will be through our website or third party websites."

Third party websites are another important way to distribute tickets. "The cheapest way for all is on-line distribution. It is complicated, however, if a passenger wants to book a tour, since they will need to use several airlines, whose websites will not interact with each other," says Vos. "On-line systems therefore need to be more sophisticated. Large corporations have specific deals with airlines, or organise their travel through a travel organiser. This will stimulate companies to go through on-line travel agents, rather than airlines' own websites."

"Flybe has made tremendous strides in reducing its cost of distribution by

Low-cost airlines have led the way in using the internet as a main distribution channel. This has not only reduced distribution costs, but the simplified revenue management philosophies that have followed have also led to reductions in staff associated with pricing and revenue management.

leveraging the scalability of the internet and simplifying its fare rules. The reduction in distribution fees and agency commissions is more than 75% over the past five years. This is mainly because of reduced commissions and a shift from GDS bookings to our own reservations system through our website," says Kochak.

Airlines, however, are facing technology and cost barriers to establishing their own reservation systems that take bookings and sales from all types of distribution channels. "This typically requires a hosting solution to support the complete airline reservation system requirements, like providing state-of-the-art inventory management features to maximise airline revenue," says Rajnish Kapur, executive vice president, travel technology solutions at Kale Consultants. "Extensive integrated functionality includes flight reservations and booking management, schedules and seat inventory control, and fares and automated ticketing. Creating and maintaining a system of this magnitude requires huge infrastructure and high investment. This is why the airlines are shelving their existing CRSs and moving to hosting solutions offered by either GDSs or the companies in the focused business area of hosting solutions."

Kale Consultants' internet booking engine, 'eBookEngine', connects to a GDS or CRS for accessing information on schedules, inventory, published or private fares, and making sales. This system offers a multi-connect solution to distribute inventories from GDSs, CRSs, third party engines, private databases, and direct supplier websites (low-cost airline websites) through a single user interface.

SITA's E-Commerce Platform, powered by iTravelDirect technology, enables airlines to build travel planning and booking solutions to match their business objectives. Because it is not a 'shrink-wrapped' product, it can be configured to suit an airline's unique needs. It has been used for large-scale online solutions for companies such as Air New Zealand, Amtrak and Sears Travel.ca.

Lufthansa Systems is going to introduce a modern technology hosting solution called Future Airline Core



Environment (FACE) to the market. One core element of FACE is the Distribution Handler that can provide airlines with the required flexibility to implement distribution strategies.

The Lufthansa Systems Distribution Handler allows the user to control and monitor distribution, including availability, fares, fees and charges via the various distribution channels. Consequently it makes it possible for airlines to react quickly and in real time to changing product strategies and market environments. "A differentiated sales strategy, depending on the channel, can easily be implemented. Call centres and other channels, for example, can be treated differently to the airline's own website or third party websites, or offer special conditions for certain markets or regions. This solution, which offers the usage and integration of today's full range of distribution channels as well as its modern architecture and design, allows easy enhancement to any future channel type," explains Christoph Lang, programme manager of FACE at Lufthansa Systems.

Ticket issuance & e-tickets

With on-line sales thriving, e-tickets have been replacing traditional paper tickets. In 2004, 41.4% of North American airlines' sales, 20.7% of European airlines' sales and 16.5% of Asia Pacific airlines' sales were issued as e-tickets.

IATA revealed in 2004 that a priority set by most airline chief executives was to deliver 100% e-ticketing, and has set the end of 2007 as the deadline for the end of paper ticketing for all its members. IATA

estimates that e-tickets save airlines \$9 per transaction when all related costs are considered. This translates into an industry saving of about \$4 billion per year, partly offsetting higher fuel costs.

British Airways (BA) is trying to achieve 100% e-ticketing, 50% self-service check-in, and 80% of BA Executive Club transactions being conducted on-line. The target is to achieve a £100 million (\$190 million) saving within two years.

Another example is KLM, which issues 60% of its sales as e-tickets. "The cost of issuing an e-ticket is 6 Euros less than a paper ticket, because no paper is required and there is a saving in administration costs," says Vos.

The landscape of e-ticketing in China is entirely different. China Southern Airlines began to issue e-tickets just three years ago, and was the first major Chinese carrier to do so. Apart from CAAC's pricing regulation, another constraint is the limited use of credit cards in China. The savings generated from e-tickets, however, are attractive. Printing a paper ticket costs Chinese airlines about \$0.8, and the additional administration cost is considerable, although with Chinese labour costs being much lower than those in Europe and North America, the operational cost saving that Chinese airlines can gain from issuing e-tickets is still lower than their European and North American counterparts.

China Eastern Airlines estimates that an e-ticket saves it about \$1.2, compared with a paper ticket. E-tickets save mailing and administration costs.

With the use of credit cards increasing, e-ticketing is prevailing in



China. China Eastern started issuing e-tickets in January 2004, with about 2,000 passengers per day using them. E-ticket users have reached a high of 600,000 over the first 10 months, accounting for 3% of domestic passengers. China Eastern's savings from e-ticketing have thus reached about \$720,000. Assuming 100% of tickets are e-tickets, savings could reach \$24 million. Another incentive for China Eastern to issue e-tickets is that American Airlines, its codeshare partner, will remove paper tickets and only use e-tickets in 2005.

Travelsky provides an e-ticket solution for Air China. China Eastern uses weblogic 8.1 software and IBM Mainframe to issue its e-tickets, while China Southern has established a joint venture with a local IT provider.

Although e-tickets can reduce airlines' costs, their utilisation is constrained by two bottlenecks. The first is that, if the technology standards adopted by airlines are different, then the airlines' passengers cannot use each other's service. This happens to airlines within the same alliances, and prevents e-tickets being widely used. Airlines are making efforts to break through the bottleneck. In April 2005, Oneworld, an airline alliance including American Airlines, BA, Aer Lingus, Finnair and four other members, became the first major airline alliance to achieve complete cross-member electronic-ticket interlining. This is forecast to save the alliance about \$65 million a year.

The other barrier to e-tickets is the lack of necessary equipment at airlines' stations. KLM and Chinese major carriers are some of the airlines facing this problem. China Eastern, for example, had only 21 domestic stations capable of accepting e-tickets, besides its Shanghai base, when it started using e-tickets.

"Interline tickets, the ticket connecting to/from a Flybe flight onto another airline, and some GDSs, are proving a little more problematic for us to achieve 100% e-ticketing, but that is our medium-term goal," says Kochak.

Lufthansa Systems has created a state-of-the-art solution that is integrated in its comprehensive Hosting solution and handles the e-ticketing processes which deviate from conventional ticketing and check-in processes. For example, all of the data relevant to e-ticketing are stored in a separate database. Worldwide access to these data is ensured, since this is the only way to make e-ticketing available within an airline's entire route network.

"The latest development into e-ticketing is SITA's offering of industry standard e-ticketing, meaning its customers now have the tools at their disposal to participate in GDS sales and interline electronic ticketing agreements. This solution is currently in production," says Rob Drotar, product manager at SITA E-Ticketing. "What are changing, however, are the elements in the databases and messages. This year a number of new elements, mostly to structure the fare calculation, which

China's airlines have only started using e-tickets in recent years, having previously held back by the low utilisation of credit cards in China. The major airlines are already realising large savings with a minimal volume of sales transactions being issued as e-tickets, while the long-term benefits could run into hundreds of millions of dollars.

support functions like automated refunds and exchange, have been added to the e-ticket standards (database and message). This demonstrates that the industry is rapidly moving beyond the limits of paper documents and is preparing systems for efficiencies that will benefit both passengers and airlines."

Sales transactions

With the use of electronic distribution channels and e-tickets increasing, the use of credit cards, that is American Express, Diners Club International, Visa and MasterCard, for the purchase of airline tickets has also risen. "The majority of tickets sold on the internet are credit card bookings. We are trying to encourage travellers to use bank transfers on our website as well as credit cards," says Vos.

Passengers' intensive use of credit cards to book tickets has not necessarily helped airlines to reduce costs, since many have little bargaining power with major credit card companies. With its global business and strong bargaining power, IATA is collaborating with its member airlines to negotiate substantial benefits with the major credit card companies. According to IATA's Card Service solution, based on its global card business, an airline can negotiate with credit card companies and reduce its credit card fees by an average of 25% in transactions with Visa and MasterCard.

Agent commissions

One decade ago airlines sold the majority of tickets through travel agents, which charged airlines commission rates of 9%. Now that airlines have the internet as a more attractive method of distribution, a smaller percentage of sales are made through travel agents. Airlines have also reduced the commission rate paid to travel agents to 1% or even zero, thereby reducing costs substantially.

Travel agents have partially responded to this by launching their own websites, of which Expedia is the most prominent. Even though agents receive negligible commissions, they now charge fees for their services to corporate customers, which continue to use travel agencies to obtain volume discounts.

Flybe is one carrier that has used specialised software to monitor competitors' web-based fares and then use this information to optimise fares and fare availability. Several pricing software products are now available to airlines and these can not only improve yield mixes, but also save overheads related to pricing and revenue management.

Pricing

The surge in diversified distribution channels and e-tickets makes airlines' fares more transparent than ever. IT providers thus produce various pricing-decision assistance systems to track airlines' fares and change the method used by airlines to reach pricing decisions. For example, in July, 2004 BA's Edinburgh-Birmingham flight was priced at around £56 (\$106) (sector pricing), compared to a very similar flight operated by Flybe priced at £20 (\$37). How could BA still charge twice the fare as Flybe when operating between the same airports and offering a similar service? This is mainly because Flybe could not directly track and respond to BA's fares.

In late 2004, Flybe chose Igentica Flightmonitor, a price optimisation software, to enhance its pricing processes. Igentica's Flightmonitor platform is a system that allows airlines to check fares from other airlines' websites using non-loading and non-blocking techniques. Flightmonitor can be programmed to retrieve data in a customer-defined format. For example, competitors' prices, routes and schedule information can be monitored on a daily basis for multiple airlines across Europe. In addition, a value-added application can be used to analyse this information and output a set of prices by each route which can be fed into the airline user's pricing and revenue management (RM) system. Airlines thus can conduct real-time searches on particular competitors, routes or cities.

There are various other systems available to manage pricing. Sabre AirMax Revenue Manager uses a customer choice-based forecasting module, coupled with an optimisation module, to generate inventory controls at the market's origin and destination level. This module takes the host airline schedule and pricing into account, along with the competitor's schedule and pricing, to quantify demand behaviour. This is optimised based on the host airline's capacity in the market.

SITA offers 'iRobot', a tool with which an airline can monitor what its competitors are doing in key markets for specific time periods. It can respond in real time and in an informed way based



upon analysis of all pricing factors.

Lufthansa Systems's ProfitLine/Price is one of the most comprehensive pricing softwares available today. It covers all core processes in reactive and proactive pricing for published and market fares. Based on a fare database, ProfitLine/Price provides a quick fare data collection from various data sources, a large number of tools for analysing the user's and competitors' fares, and easy-to-use fare editing and distribution functionalities.

ProfitLine/Price supports the full pricing workflow including collection of fare information such as competitor fares, fare analysis, managing fare requests from sales, fare and rule editing, approval of price changes and distribution of fares supporting a variety of distribution channels, for example ATPCO, SITA, internet booking engines, paper bookings by use of fax, and email.

The various sophisticated softwares, however, not only contribute to airlines' upper line, but also substantially reduce their costs. "The cost of pricing includes the price distribution component, as well as the operational cost of maintaining a pricing group. There are systems available in the market place that provide pricing distribution automation (for example, the Sabre AirPrice fares management system) at a lower cost," says Murray Smyth, vice president at Sabre Airline Solutions. "On the broader perspective of airline pricing, with the emergence and growth of low-cost carriers, pricing structures have become more simplified, resulting in lower maintenance costs. With combined decision support between pricing and

revenue management, responding to market place pricing changes has become more automated, thus reducing overall costs."

"Staff costs can be reduced by making use of SITA's Fare Insight. Distribution costs can be reduced by filing fares directly to (certain) GDSs, into the airline's own website and to travel agency groupings," says Laurence Oliver, director of fare management at SITA.

With the assistance of automated pricing tools, airlines have saved significant labour costs previously incurred from the traditional pricing process.

"Igentica's software has enabled us to obtain information that would otherwise have been cost-prohibitive to procure. Since we receive daily data feeds of literally thousands of fares on the internet, my only substitute would have been to employ several people simply to check fares on the internet, a job which is too tedious and time-consuming to be done manually," says Kochak.

The use of automated pricing software is of limited use in China due to remaining fare regulations and the market monopoly formed by the three major airlines. Hence, the pricing software provided by Travelsky still has to be used widely.

The development of pricing assistant software also reduces the operational cost of RM. "Revenue management, in the current environment, cannot be seen in isolation from the pricing group. The two areas have become much more integrated from a business process perspective. With Sabre's existing systems (for example,



Revenue Manager and the AirPrice system) and an aligned business process, the operational cost of integrated pricing and RM can be far lower than before," says Smyth. "With the current systems, the monitoring of competitors' fares and an airline's reaction to the changing environment have been automated, and airline analysts have all the data and computed information available to them immediately. It is possible to achieve a better yield mix with RM systems that quickly respond to market conditions."

SITA's RM system has auto-control functionality, which allows user-defined parameters to be set permitting automation of a large number of the recommendations every night. This system aims to optimise the yield mix to deliver the optimum revenue, while also reducing the level of no-shows. This system uses a hybrid version of the EMSR optimisation algorithm, which is widely used in traditional RM. SITA also has a new algorithm, which is developed to specifically combat the threat from the new business processes and pricing of low-cost carriers.

Revenue accounting

Among the whole distribution and marketing process, more prominent savings derived from the wide use of information technology come from revenue accounting. The first saving comes from the acceleration of cashflow.

In August 2004, China Southern began to use its Airline Stock Ticket System. The application of the system generates a cashflow of about \$20 million every week for China Southern.

Stimulated by the outcome, China Southern plans to extend the system to its overseas offices this year.

The second saving is time. "Generally, it takes about 10 days after month end to complete the revenue accounting process, but our medium-term goal is to accomplish it within three days of month end. Having all e-tickets with no refundability, mostly booked on our own website, will help us achieve this goal. We know how much revenue we have sooner than we did before, and this helps forecasting, business decision-making, reporting, and financial stability," says Kochak.

The third benefit is the saving of labour costs. "We have seen a steady decrease in the number of revenue accounting staff over the last two years, while Flybe's passenger base has grown by 25-40% over the same period," says Kochak. Thanks to the wide use of its financial system, China Southern has not significantly increased its accounting staff, even though its passenger numbers have risen by 31.6% in 2004.

Cathay Pacific goes further than its peers in mainland China. Due to its wide use of e-tickets and the elimination of the need to transport paper records, several years ago it moved its finance settlement centre from Hong Kong to Guangzhou, and employed local people to complete revenue accounting. Since a Guangzhou local's average salary level is 50% of a Hong Kong local's, the relocation has significantly reduced Cathay Pacific's labour costs.

The software to enhance airlines' revenue accounting ability has been available in the market. The SIRAX

Low-cost management philosophies have allowed many airlines to reduce costs related to distribution, pricing and revenue management, sales commissions and ticket issuance, and revenue accounting. These have overall allowed many carriers to keep up with some of the drop in gross yields by achieving net yields that are a higher percentage of gross yields.

revenue accounting solution from Lufthansa Systems handles all aspects of the billing process in detail. Airlines can reduce the amount of effort they put into revenue accounting by up to 70%.

General savings

"Flybe radically changed its business model only three years ago. In addition to actual cost savings, the efficiencies introduced by the new business model have allowed simpler processes, stable or reduced headcount during 25-40% traffic growth, and better economies of scale which will support our ambitious growth going forward," says Kochak. "Flybe will announce a major operating profit for 2004/05, its first for the past three years. Our yields have declined by over 20% during that period, and our route network has changed dramatically. Clearly, to achieve the profit our overall costs have declined faster than that. We have 91 routes today, but we had only 40 three years ago. It is a major turnaround of the entire business, and the cost savings described above are an important part of that success."

Air France and KLM have created an IT Synergy Programme to rationalise the IT infrastructure of both airlines. The target is to achieve synergies worth 70 million euros annually after 2009.

For Chinese carriers, the potential savings from the utilisation of IT are massive. Assuming these carriers reach the goal set by the CAAC that 50% of sales are e-ticketed by 2007 when passenger numbers are expected to reach about 0.16 billion, the total savings from e-tickets would be about \$100 million per year. Each of the three major carriers can save about \$28 million based on their market shares. On the other hand, the greater the use of e-ticketing and on-line sales, the less the Chinese carriers rely on GDSs and CRSs. If the expenses for these services can be lowered by 50%, a major airline can save another \$21 million per year. Hence, each Chinese major could achieve a total reduction of about \$49 million. In 2004, the three majors recorded a profit of \$630 million. When the optimisation of RM is included, which the airlines have still to implement, the benefits from these systems will boost their profit margins still further. **AC**