E-ticketing and software development has allowed revenue accounting to become automated. This not only saves labour and operating costs, but also minimises revenue leakages. Revenue reporting time is reduced to as little as one hour, and detailed analysis of yields can be made.

Recent advances in revenue accounting

Revenue accounting has become automated in recent years. Together with the increased use of e-ticketing, airlines now have higher visibility and more detailed analysis of revenues they are generating, at higher speed. Airlines can also sub-contract revenue accounting, avoiding the investment in new systems and hardware. The accuracy of new systems is also blocking the many revenue leakages that were experienced with the traditional manual processes and older systems.

Accounting issues

The basics of the revenue accounting process have not changed. Passenger and cargo sales are regarded as the airline's liability until the service is flown, and these sales data have to be matched and reconciled with uplifted coupons from passengers and freight flown. Interlining passengers using one or more carriers creates the need to reconcile and share revenues between airlines. The formation of alliances between large numbers of airlines means that interlining now accounts for a larger percentage of the data to be analysed and processed.

The revenue accounting process is complicated because airports, airlines and countries all have their own tariffs, surcharges and taxes. Fluctuating rates of exchange between different currencies, passenger refunds and various types of revenue leakage all add to the difficulty.

The increased use of e-tickets has contributed to the automation of the revenue management and reconciliation process. The International Air Transport Association (IATA) had set a target for 100% e-ticketing from all bank settlement plans (BSPs) and other settlement channels by the end of 2007. This has been extended to May 2008.

There are, of course, still areas that do not have a BSP, like Russia, Vietnam and parts of Africa. Paper tickets still have to be used because airlines do not have a connection or access to the network, or they lack the specific skills required. Even within an area with a BSP, airlines can still issue paper tickets for their own services. Airlines that agree to have interline tickets with other carriers from a part of the world that does not have e-tickets, will have to reach agreement on using paper tickets, and will therefore still have to perform revenue accounting with paper coupons.

System requirements

The manual process of accounting with paper coupons was laborious and open to errors and revenue leakages. Each coupon collected from a passenger had to be sent to the airline's revenue accounting department. Claims were then made manually from other airlines and travel agents. Some had to be made via the IATA clearing house, through its interline data exchange centre (IDEC).

"The manual process was prone to many errors," says Philip Fernandes, senior vice president of passenger practice at KALE Consultants. "Mistakes were made entering paper coupons into systems manually, and there was also duplication of data. Sometimes coupons even got lost so that revenue could not be claimed. The process was also expensive, and it took several months to get an accurate picture of the revenue generated. The number of claims was so large as to make manual checking of every coupon uneconomic. Airlines therefore had to estimate revenues owed from other carriers using statistical methods.

"E-tickets have allowed a high portion of the basic recorded sales to be reconciled with 'uplifted' records of passengers boarding flights automatically because all the information is electronic," continues Fernandes.

When a passenger boards a flight there is an electronic ticket line record (ETLR) with a variety of information about them, including their name, their origin and destination, the fare, and the booking class of the fare. This ETLR is sent to the revenue accounting department to be reconciled with the information in the recorded sales.

This electronic data exchange is a welcome development for a complex process. Airlines collect sales information from a variety of sources, including: travel agents, which can be located all over the world and send their sales records to airlines via BSPs and other channels; directly via their own computer reservation systems (CRSs), accounting for several direct sales channels that include their website and reservations centres, as well as some sales made by travel agents; and manual sales.

Sales fall into three basic categories. The first is where the airline marketing the ticket also flies the passenger, in which case the airline's revenue accounting system has to reconcile passenger-flown data from its departure control system (DCS) to its sales records. This part of revenue accounting is managed by the system's online module.

The second category is where the airline flies the passenger and has collected a coupon, but the ticket was sold by another, 'marketing', carrier. This can arise in the case of an interlining passenger, or the marketing airline's CRS simply being used to sell a ticket. Here the airline that has flown the passenger has a debt to claim from the marketing airline. This has to be collected, and the process is handled by the system's interline module within its revenue accounting system.

The third category is where the airline

The increased use of e-tickets and continued development of software now means passenger number and fare information can be transferred automatically by an airline's DCS to its revenue accounting system within minutes of flight closure. This allows revenue reporting to be made within as little as one hour of departure.

sells the ticket, which may have several coupons. The passenger uses one or more of the coupons to fly on another carrier, which then is entitled to make a claim from the marketing carrier. In this case the offline module of the marketing carrier's revenue accounting system has to record the liability and authorise payment to the airline that has flown the passenger.

Complications

These are the basic requirements of a revenue accounting system, but there are several complications to the process as well as many ways an airline can leak revenue. There is also the issue of how fast the system can provide an accurate assessment of the revenue generated.

One major calculation a revenue accounting system has to make is pro-ration of interline tickets. Systems will have a fare calculation line which starts by analysing which company sold the ticket and which airlines flew the passenger, and whether these are the same or not. If the ticket is an interline the system will use its pro-ration model to see how the fare should be split between the carriers used. The split can either be determined by the IATA standard pro-rate formula, or by previously established special pro-rate agreements (SPAs) made between airlines.

The system must also establish which taxes and tariffs are relevant. "For example, departure taxes vary for each country," says Fernandes. "The relevant tax therefore has to be applied depending on which country the DCS system says the flight left from. Sales taxes apply when the ticket is sold, and the rates of these also vary by country. Flown taxes, such as airport taxes, are only collected when the passenger flies. Once the coupon has been used the related tax is considered as used. The flown tax can therefore be converted from a liability to one that can be paid. A good system is required to allocate all the different taxes due on a ticket, so it needs to feature the different rules for all countries. Another complication is the different taxes for interline and point-to-point passengers."

Calculating refunds requested by passengers is complex, since a refund can apply on all or some of the coupons in a ticket. Rules on refunds differ according to fare class, while only some taxes are

refundable.

Revenue leakage also occurs at various stages of the sales-to-boarding process. An example is where passengers are sold the incorrect fare class, whether deliberately or by mistake. Revenue accounting systems identify these cases and can raise agency debit memos (ADMs) to invoice travel agents for the difference between the sold fare class and the fare class that should have been used. The chance of recovering leaked revenue is therefore improved with the use of automated revenue accounting systems.

An automated revenue accounting system therefore first has to establish which airline flew the passenger on which coupon. Once it has done this, it uses its pro-rate model to see which carrier gets which share of the ticket. The system also establishes the taxes and tariffs due for each of the coupons, and these have to be deducted to provide a net fare for each coupon. The system also has to apply the sales commission due to the travel agent and the global distribution system (GDS) at some stage. The total of all these elements should be equal to the fare sold by the travel agent or marketing carrier. If the total reconciles with all the elements the system accepts it. If the elements and total fare do not match, then the system's audit and pricing module investigates the discrepancy. It is important that the fare rules for each coupon are also followed. This checks if the airline has suffered revenue leakage.

Automation

The advent and widespread acceptance of e-ticketing has allowed the revenue accounting process to become more automated. "This allows more

matches to be made fast, and systems now have data at the end of each day," says Fernandes. "The e-ticket system, which is in parallel to the CRS, feeds information into the revenue accounting on a daily basis. When a passenger checks in, the system sees that they have a valid ticket. The sector is annotated to say the passenger has flown and the revenue is sent to the revenue accounting system.

"The advantage of this technology is that information can now be sent every 24 hours for passenger uploads to be matched with sales records from BSPs and other clearing channels," continues Fernandes.

SITA's passenger revenue accounting system provides automated revenue accounting in a real-time environment. "A more recent development is a robotic transfer of ETLRs from the DCS to the revenue accounting system," says Allen Casey, product manager passenger revenue accounting at SITA. "The robotic transfer of ETLRs requires no human input, and can be done within only an hour of flight closure. This transfer removes human errors and allows 100% matching with the sales data, thereby contributing to reduction of revenue leakage."

The objectives of automated revenue accounting are to: maintain a tight control on revenue; automatically detect overbillings; reduce the number of lost coupons; correctly audit taxes and tariffs; issue travel agent debit notes (ADNs) when incorrect fare classes are used; have multi-currency and tax capabilities; pro-rate interlined tickets; reconcile e-tickets; and provide real-time information on revenue generated, yields achieved per passenger, load factors and other useful data.

Interlining

Interlining has become more numerous with airline alliances. The accounting process for interlining has become more accurate with the use of e-tickets. Systems are now programmed with pro-ratings for different airline combinations and city-pairs. "Our RAPID system is fully compliant with revenue accounting manual rules, which are governed by IATA," says Aslam. "RAPID also has an in-built profit system to bill other airlines and exchange data electronically through IDEX in the case of interline tickets. RAPID has rules for the IATA clearing house (ICH) or the ACM for all the American countries. These rules even apply to airlines that are not IATA members. RAPID can exchange the data of invoices via the IATA website, which aids the speed of billing and clearance of invoices, and minimises disputes between airlines.

"Airlines are now moving towards other pro-ration models, especially where they are alliance partners," continues Aslam. "Most pro-rated tickets are now between airlines that have signed some sort of multi-lateral agreement, and billing information is shared between them, so that they do not have to pay for ICH services."

KALE Consultants' REVERA system has a pro-ration engine called APEX. "The two segments of an interline ticket are allocated and weighted, usually by mileage, to the two airlines according to the pro-ration rules," explains Fernandes. "SPAs are automatically applied by APEX, which sends the revenue generated to the two airlines.

"We deal remotely with both cargo and passenger revenues with our REVERA system," continues Fernandes. "APEX powers the IATA 'first and final' billing and settlement process for interline tickets, so that disputes between airlines often get resolved at the first attempt."

Taxes & tariffs

As described, several taxes and tariffs are applied to a ticket, some of which are non-refundable, some of which can be refunded if the passenger does not fly. "Taxes are one of the most complex areas in revenue accounting, because of the different rates and systems used by each country," explains Aslam. "Verifying payment and collection of taxes is hard, but RAPID has a comprehensive tax engine that produces three sets of daily figures for the airline: the tax collected on tickets sold during the day; the tax collectable from travel agents or internet booking sites that have sold tickets for airlines which have flown the passengers; and the tax payable on collected revenue to all the different governments. An example is a passenger buying a ticket in India for return from Mumbai to London. There is a tax to pay at Mumbai, a tax to pay at London for the return leg, and surcharges to pay to the airline. An airline is still liable for paying a tax to a government, even if the travel agent or internet booking site does not pay the tax. The taxes that are calculated and collected depend on the knowledge of the person issuing the ticket, and mistakes are often made and the incorrect taxes are applied.

"There is also a degree of fraud by travel agents, which is a source of leakage for the airline," continues Aslam. "RAPID uses a complex tax engine to ensure the correct taxes are collected by an airline. This includes ensuring the right amount and rates of taxes are collected. The first problem that can arise is that the tax collected is less than the tax due or collectable, in which case RAPID forces a debit note on the travel agent, internet site or ticket seller. The second problem is that the tax collectable should equal the tax payable, since taxes have to be passed on. Governments give some flexibility on deadlines for paying these taxes, but the rules for each government have to be known by the system. It is also easier if airlines pay taxes locally.

"Another problem with airlines' revenue accounting systems is that they sometimes use basic methods, such as Excel sheets, to programme different taxes into their systems. This can cause revenue leakage if they undercalculate taxes, since they still have to be paid."

At one time airlines only had to deal with four to six types of taxes, which was relatively simple to deal with in terms of revenue accounting. "The number of taxes and tariffs have increased, which has led to the need for improved capability from revenue accounting systems," says Casey. "We have introduced a capability to deal with up to 99 taxes in our revenue accounting system. This will be available from the second quarter of 2008."

Refunds

Refunds are relatively straightforward when just one airline is used to fly the passenger. Airlines have different rules regarding refunds, and the level of refund depends partially on the fare class of the ticket. Some taxes, travel agents' fees and commissions are not refundable so passengers will not get a full refund. "It is more complex with interline tickets," says Fernandes. "Only some coupons may have been used. Revenue accounting has to use the pro-rate module to calculate which portion of the fare and taxes is refundable."

Refunds start with an approval process that analyses utilised and non-utilised coupons. "Airlines are contacted for refunds, and when they approve and the amount is identified the message is sent to the revenue accounting system. RAPID interfaces with the approval process, and takes the information to the accounting department," explains Aslam. "There are refunds for various

Revenue accounting systems have developed to the point where detailed information on passenger numbers and load factors, total revenues, fares and net yields can be presented and used within a short time of flight departure. This provides intelligence that can be used by an airline's commercial and yield management departments.

eventualities, including a passenger not using their ticket, or even being downgraded. RAPID has a refund module to identify the correct fare, and ensure that tax refunds are made and there is no revenue leakage."

Revenue leakage

Revenue accounting is just one area of the revenue generating process where an airline can experience revenue leakage. "The first way this can occur is if travel agents sell tickets at fare classes that are lower than should be permitted, because they have not adhered to the fare rules," says Fernandes. "Leakage due to these reservation booking designator (RBD) violations causes a mis-match between the sale or liability and the reservation," says Fernandes. "An automated revenue accounting system helps prevent this leakage by discovering these differences. Once these RBD violations have been discovered the revenue accounting system can issue ADMs to charge the agency for the differences in fares. "

"A lot of services are now sold in addition to tickets, including car hire and hotels. The airline adds miscellaneous charges to each of these, and revenue accounting systems should therefore issue miscellaneous charge orders. There can be mistakes in these charges, and airlines can leak revenue as a result," explains Aslam. RAPID tracks these miscellaneous charges and additional services to minimise leakages.

"Other examples of ancillary revenues are seat assignment, early boarding and special meals," adds Aslam. "Cash is often collected for these, and RAPID can analyse these services to see if they are profitable."

Reporting time

The use of e-tickets and electronic interchange between systems has greatly increased the speed at which revenue generated can be ascertained. With paper tickets it took several days after a month's end to get a revenue figure for the airline's whole operation, but it is now possible for systems to report revenue generated for each flight at the end of the day, or even within a few hours of the flight departing. "Airlines would like to have the 'wheels up' revenue as a flight departs," comments Fernandes. "It is possible for a system to send the revenue generated for each flight after it departs or when it reaches its destination. This is matched with the revenue sales data within a few hours. This will become reality when 100% e-ticketing is achieved. This information can then be quickly used to provide yield and load factor data, as well as being passed to the revenue management and commercial departments so that decisions about changes to capacity, scheduling and yield management can be made. This is particularly useful when airlines are taking their competitors into consideration."

This information is clearly important for business intelligence data. "We have a new system called 'web query', which is an IBM tool integrated on the server. This new functionality harvests data from the revenue accounting system and tells it to present it in a specific way. For example, an airline may want net yield in each cabin class to be compared with load factor, or time of week," explains Casey. "The data is also presented according to the airline's revenue accounting rules so that the information reconciles."

Third-party accounting

The exchange of electronic information and the automation of the revenue accounting process allows the function to be performed remotely. This means that airlines can sub-contract revenue accounting to specialist providers.

There is a trend by airlines towards using an application service provider (ASP) via a secure internet connection. An ASP means that airlines can have pay-as-you-go revenue accounting systems. The advantages of these to airlines are that they do not have to update their own systems, pay licence fees, invest in hardware, or have a team of dedicated technicians. Another advantage of an ASP system is that it significantly reduces an airline's start-up investment.

SITA has so far not offered third-party services to airlines, but will start to offer these before the end of 2008. It already has one or two launch customers for this product.

KALE Consultants has been offering revenue accounting services for 17 years, and does a lot of business process outsourcing. Their product manages the complete revenue accounting process.

Mercator's RAPID system is used by more than 40 airlines worldwide for revenue accounting. "RAPID provides various services, and airlines such as South African Airways and TACA use it because it has an open architecture that means it can interface with CRSs, such as SITA and Amadeus," says Aslam. "It also interfaces with the Air Tariff Publishing Company (ATPCO), which provides airline tariff data to the various GDS systems. During the night ATPCO sends information to an airline's CRS and yield management system, informing it of the sales it made that day. RAPID follows business rules to validate the quality of the data it receives, and data that is good is processed for revenue accounting. With e-tickets the objective is to have 100% automatic processing and zero manual intervention. The revenue accounting process is carried out overnight, and the revenue generated can be reported to the airline at the end of the day. **AC**