

The passenger sales process is constantly becoming more complex. The entire sales process can be categorised in about 12 steps. The major systems & solutions available to airlines for the different elements of passenger sales are reviewed.

Systems & solutions for the passenger sales process

There are 12 or more stages in the passenger sales process. Starting from market intelligence to the relatively new element of generating ancillary revenues, there are numerous systems and solutions available to the world's airlines from several dozen suppliers. The majority of these products are surveyed and profiled here.

The industry's biggest suppliers include Amadeus, Lufthansa Systems, Mercator, Navitaire, Sabre SITA and Travelport. These are the most established and offer comprehensive range of solutions, covering virtually every aspect of passenger sales. Other solution providers are specialists that cover just one or two areas. In addition, airlines are no longer limited to purchasing system licences and running solutions in house. Paying for fully-hosted solutions on a flat-fee or per-transaction basis has become common.

Market forecasting

The first stage in passenger sales is market forecasting, which involves analysing competitors' schedules, capacities and fares to gain intelligence about a market's size. This process is then used with the airline's own proposed schedules, capacities and fares to predict what traffic volumes and revenues it will generate. The type of traffic and passengers' buying behaviour is also an important part of market forecasting.

Market forecasting data is also used in market intelligence data (MIDT) and analysis. Both use data relating to competitors' capacity and fares. Market intelligence data combines capacity and schedule information with competitors' traffic volumes, passenger numbers in each class, sales volumes via different sales channels, actual fares achieved, and

the number of direct and interlining passengers. It is not possible, however, to get all this information, which would allow a complete picture of the activity in a market. MIDT is used after flight services have occurred, to feed back to an airline's decisions in respect of its schedule, capacity, pricing and fare rules.

The same systems that provide capacity and fares data for MIDT are used in the marketing forecasting stage. The main providers of solutions in this field are Amadeus, Lufthansa Systems, Sabre, SITA and Travelport.

The International Air Transport Association (IATA) also has access to schedule and capacity data and information. Its PaxIS software analyses its own and competitors' data relating to passenger numbers, load factors, schedules, capacity, fares, yields, yield mixes and unit revenues.

Amadeus has several MIDT products for airlines to choose from according to their requirements and network size. In addition to schedule and capacity information used in market intelligence, they also provide data on bookings made via its global distribution system (GDS) product that will be used in MIDT analysis.

The most comprehensive product is World MIDT, which provides worldwide schedule, capacity and booking data. International MIDT provides data relating to all global city/airport-pairs except intra-European ones. Custom Network MIDT provides information on 100, 200 or 300 city/airport-pairs specified by the airline, while Express MIDT provides data for 50, making it suitable for start-up airlines. Network MIDT provides data relating only to routes in an airline's network.

Lufthansa Systems offers its ProfitLine/Yield product. Regional and low-cost carriers (LCCs) use the

Rembrandt model variant of this product to make segment forecasts, while network carriers use the origin and destination (O&D) variant to make O&D forecasts.

Lufthansa Systems' NetLine/Market product is a data warehouse that retrieves and analyses passenger travel data at high speed. It is apparently the only solution that is able to process and combine data from GDSs and travel agents.

Sabre is another major provider of systems. Its market forecasting product is Air Flite Profit Manager, which allows an airline to enter its own schedule and compare it with those of all other carriers in a market. The system predicts market shares for each one, and can also see how the schedule addresses the needs of customers, and breaks this down by cabin classes.

Sabre also offers its Schedule Manager and Air Flite Fleet Manager products. These combine core functions such as scheduling, fleet assignment and slot management to determine which markets to serve, and the frequency, times and capacity that should be offered.

Another Sabre solution is Wise Vision, which analyses the market data that airlines use for schedule planning and calculating the sales volume and market share delivered by each travel agent.

SITA provides one of the most comprehensive ranges of services and solutions. Although it does not actually provide a marketing forecasting solution, its network-capacity-planning consultancy service forecasts how a current network can sustain growth.

Travelport in the US offers several products for market forecasting and intelligence processes: Clarity is an MIDT product for small and regional airlines; Acuity provides market network data for all carriers; and Discover is an airline-scheduling product that provides regional

The passenger sales process involves a large number interdependent, complex steps. There is a plethora of systems available for airlines to choose from. There is a choice between complete or standalone solutions from a smaller number of major systems providers, or selecting individual modules from specialist providers.

airlines with a network planning tool.

One specialist area in market forecasting is competitors' fares, which can be published or unpublished. Competitor fare information is also used in MIDT, and revenue management (RM) and pricing. Some specialist providers offer webcrawler software products that scan competitor websites to obtain data relating to published and unpublished fares. One such provider is QL2, which searches for fares, flight numbers, schedules and other itinerary information.

DOB Systems processes MIDT data from all nine major GDSs, and analyses the booking data, providing its report via an internet page. This can be presented so that airlines can see which routes or markets need to be targeted.

Distribution

Several forms of distribution have evolved over recent years. In addition to the traditional GDSs, airlines now distribute their products directly via their websites and indirectly via on-line travel agents.

The large providers of traditional GDSs are Amadeus, Sabre and Travelport (which acquired Worldspan), while smaller GDSs include TravelSky, Abacus, Topaz, Access and Infiny.

Airlines are able to subscribe to as many GDSs as they need, so each GDS has several airline customers. The Amadeus GDS, which was the last of the 'legacy' GDSs when it was launched in 1987, is the flagship product of Amadeus, which now provides solutions for several other areas in the passenger sales process. Advertising is now a feature of the Amadeus GDS product, since it can be used to display banner adverts for airline products. Amadeus also offers several new features, such as a faring tool product, which quotes fares for an itinerary using several airlines that do not have interline agreements.

Sabre offers two distribution products: Sabre GDS for travel agents; and SabreSonicWeb for distribution over the internet. These two products connect with more than 57,000 travel agents in 113 countries, and are subscribed to by more than 400 airlines, as well as a large number of on-line travel agents, including Expedia, Travelocity and lastminute.com.



Travelport's GDS is a mix of traditional and on-line distribution channels, comprising the Galileo, Worldspan and Apollo GDSs. They are used by 60,000 travel agents and 430 airlines.

There is also a new breed of emerging GDSs, which use the internet. One provider is Farelogix, whose FLX product is used by more than 3,000 travel agents and uses an XML link so that it can be integrated into their existing systems. FLX offers customised content at a lower cost than traditional GDSs. It also offers the same capability, but charges per net ticket or transaction, rather than on a segment basis. Its customers include Air Canada, American Airlines and Emirates.

SITA provides hosted reservation systems for airlines, with a travel agency portal that avoids using traditional GDSs. It communicates directly with airline inventory systems via the internet to avoid GDS fees. SITA charges a segment fee of \$0.50 for this, which is low compared to the traditional GDS segment fees of \$2-3.

A possible drawback is that the portal only has inventory and booking capability for one airline.

HITIT of Turkey offers its Crane Pax product, which is a web-based solution that combines internet distribution, reservations and inventory, e-ticketing, and a revenue and yield management capability. It is used by some low-cost and charter airlines, but its interlining capability means that it can apparently cater for full-service airlines too. Crane Pax has been available for four years, and is used by Pegasus Airlines and Sun Express.

Navitaire similarly offers fully-integrated distribution, reservations,

check-in, and guest warehouse products called New Skies and Open Skies. Navitaire's products are most closely associated with LCCs with simple fare structures and little or no interlining, and its biggest customers include Ryanair. Navitaire's products are also aimed, however, at other airlines that are less complex than the major alliance carriers. Navitaire's customers include airlines that have complex route and fare structures, and interline agreements, and use all channels of distribution.

Besides main distribution channels, there are additional products which help airlines gain market penetration where only small sales volumes are likely. APG-GA offers its IBCS product together with IATA. This is a pay-as-you-go billing and settlement plan (BSP) system. BSPs are an integral part of distribution, and GDSs and airlines have to use them so that travel agents can issue tickets on their behalf. The high fees for joining BSPs, up to \$25,000, dissuade airlines from trying to enter markets where they are only likely to get a small sales volume. IBCS has a joining fee of just \$1,000 and charges a 3% commission of the gross ticket price, making it more economic for an airline to enter a remote market. APG-GA has 128 airline customers for IBCS, which links into BSPs.

APG-GA also offers itself as a general sales agent (GSA) for airlines trying to penetrate markets that are likely to generate only small sales volumes. It has offices where it represents several airlines in a particular region.

Reservations & Inventory

Amadeus has several products for reservations and inventory control, sub-



divided into: direct sales channels and airline websites; and off-line channels, such as travel agents, call centres and airline offices.

Its direct sales products come under its Altea Reservations products. These airline website products include the ability to quote fares, offer ancillary services and link into frequent-flyer (FF) programmes. There are three levels of internet booking engine for different airline requirements. Amadeus can add other applications to the functionality of airline websites, such as merchandising and selling ancillary products.

For off-line sales channels, Amadeus can provide: reservation desktops for airline ticket offices; call-centre solutions for airlines; services for airlines to sell their own ancillary products in addition to basic reservations; cross-selling services to sell third-party ancillary products; and loyalty applications for managing frequent-flyer points.

Amadeus also offers Altea Inventory, a module that communicates with an airline's reservation, yield management, departure control system (DCS) and FF modules, and holds information on bookings and inventory that are still available.

Lufthansa Systems' MultiHost Sales product provides all the necessary hosting functions, including inventory, e-ticketing and interlining.

Mercator has a range of passenger sales products that come under the umbrella of Jupiter I suite of products. One of these is its MARS product that has a reservations, e-ticketing and pricing capability. MARS is aimed at medium-sized and large airlines, and uses ALCS as its technology platform. Mercator also offers Tik Aero, which provides

reservations and departure control for airlines with simple business models, such as those offering island-hopping services. Tik Aero uses Microsoft as its technology platform.

Sabre's SabreSonic Customer Sales & Services (CSS) product manages reservations, ticketing, and passenger check-in, loyalty and handling. It is the only reservations product that combines RM, customer sales and service, and merchandising.

Sabre also offers SabreSonic Inventory for managing inventory. Sabre claims to offer the most comprehensive and advanced suite of products for inventory, reservations, ticketing and passenger-handling.

These are now being combined with RM solutions so that RM and pricing actions are triggered by reservations that are happening in real time. This allows an airline to optimise its seat availability. This is also integrated with ancillary revenues, since what a customer spends and books is a key part of the RM process. Sabre is even developing its RM capability to the level of dealing with the single customer.

SITA's Horizon product portfolio offers airlines an integrated passenger management and distribution solution that covers: reservations; passenger management and ticketing; self-service booking; and customer-service technologies. Its Reservations product is a fully hosted service used by more than 130 airlines, and has key functionalities in reservations, inventory control, flight and schedule maintenance, ticketing and check-in. The Reservations Booking module can be used for bookings made via airline sales offices, GDSs and online sites. SITA's Inventory Management

The largest systems providers that offer solutions for all or most steps of the passenger sales process include SITA, Sabre, Amadeus, Lufthansa Systems and Travelport.

module can operate independently or as interfaced through an RM system.

As previously mentioned, Navitaire's New Skies and Open Skies have four fully integrated levels of functionality, including reservations.

Travelport offers Travelport Meridian, a fully integrated passenger-management system. This includes reservations, inventory and departure control modules for airlines worldwide. Travelport hosts Delta and United for these three functions.

HITIT's Crane Pax product also includes reservations and inventory management capabilities.

E-ticketing

Ticketing is closely associated with reservations, the majority of which use e-tickets. Although paper tickets are avoided, ticket numbers and passenger name records (PNRs) still have to be issued where an airline has interline agreements with other carriers, so the process requires a module in an airline's system. This is particularly the case when airlines interline with others.

Amadeus offers its Ticketing Platform, and can be connected to an airline's direct distribution channels and reservations module.

Lufthansa Systems has more than 10 years' experience of e-ticketing, and offers E-Ticketing Interlining, which is used by 150 airlines in addition to Lufthansa. Airlines pay fees according to passenger numbers or bookings, or on a flat-rate monthly basis.

E-ticketing is an integral part of Mercator's MARS and Tik Aero products, and of HITIT's Crane Pax.

Navitaire does not offer a standalone e-ticketing product, but its New Skies and Open Skies products do interface with other vendors' systems.

Sabre offers SabreSonic Ticketing as a module of its SabreSonic CSS product, which can therefore be used by airlines with or without an e-ticketing capability. SabreSonic Ticketing connects airlines to a universal electronic ticketing hub.

The e-ticketing process is an integral part of SITA's Horizon product. It also offers its Ticketing product that can be used as a standalone, and is available worldwide. It is automated and has a real-time reporting capability to provide airlines with up-to-date and accurate



detailed sales reports from the airline sales departments, travel agents, and independent sales channels and offices.

Travelport's E-Ticket interchange system is known as Interchange Suite. The product serves 5,000 interline e-ticketing relationships. Travelport hosts e-ticketing databases for hosted and non-hosted carriers.

E-ticketing has been available from Farelogix's E-FLX product since January 2009, although Farelogix has been e-ticketing for two years now, starting with Emirates in 2007. Although airlines use several GDSs, they only need one host reservation system which could be provided by Navitaire, SITA or another vendor. Airlines also need to issue e-tickets, and can work with another e-ticket vendor. While virtually all legacy airlines have been issuing e-tickets for several years, many LCCs have yet to do so since they have only hitherto sold via their own websites. An e-ticket number is required for revenue accounting purposes.

The same technology is required when selling merchandising, since passengers need to have electronic receipts issued to them. This is known as electronic miscellaneous disbursement (EMD). Two airlines are testing Farelogix's system.

APG-GA now offers services for interline e-ticketing, which is related to distribution and revenue accounting. Interline e-ticketing is used when tickets are sold for airlines that have limited market penetration in a part of the world that is a long distance from their home base. A European passenger may fly from Europe to Peru on their country's flag carrier, for example, and then fly a final sector on a domestic sector in Peru. It is expensive for airlines to set up e-interline

agreements with all other airlines, so interline revenue is often not claimed. The Peruvian airline would therefore be unable to claim their share of the revenue.

APG-GA sets up e-interline hubs for a large number of airlines that do not have interline agreements, and pro-rates ticket prices according to IATA formulae. It charges a 9% interline charge for this, and issues an interline e-ticket, thereby allowing the Peruvian airline to collect its share of the revenue.

Pricing & yield management

RM and pricing is one of the most complex and specialised processes in passenger sales, so there are few vendors that provide solutions.

Lufthansa Systems offers two products: ProfitLine/Price, which is a comprehensive pricing solution in reactive and proactive pricing for published and market fares; and ProfitLine/Yield, an RM solution that caters for all types of RM. This includes segment control for regional and low-cost airlines with simple fare structures. ProfitLine/Yield O&D is used by network carriers that control their availability and fares according to passenger flows across their networks, which includes stopovers, rather than for individual segments. Dynamic Price Engine is a new RM and pricing concept that integrates legacy and low-cost airline pricing logic. These are offered as either licensed or hosted products. Lufthansa Systems is working on several new modules to enhance ProfitLine.

Sabre offers its AirMax product for RM, either as a single module or integrated with its inventory solution. It supports the entire RM function by

E-ticketing has become almost universally adopted by network carriers, and even low-cost airlines now require e-ticket capability as they evolve their business models and form interline agreements with other airlines.

including reservations data collection, off-line data collection, forecasting, overbooking, optimisation, performance measurement and reporting. It is used by more than 35 airlines. AirMax optimises revenue by using either leg-based pricing or O&D pricing at the market level. This shows prices on a large number of possible routes and serves the market through non-stop and interline flights. Sabre can therefore cater for different portions of interlining in airlines' traffic volumes. It recommends that an airline use the O&D version for RM if interline traffic is 15% or more of the total.

SITA offers an RM solution for traditional and low-cost airlines, and claims its product can increase revenue by up to 8%. It can be integrated to various reservation, pricing and revenue accounting systems from a variety of vendors. RM has optional modules of Real Time Update, which allow the latest data on capacity and seats sold to be uploaded. Low Cost Carrier module allows traditional airlines to compete in a low-cost environment, and is used for airlines using a tier-based pricing model.

Travelport offers its Fares & Pricing suite with a range of pricing options. The pricing functionality is available to all hosted airlines and subscribers. The product also includes an e-pricing platform that supports both simple itineraries and complex ones that involve multiple carriers and segments. There are five products that allow searches from between one day and a month before and after departure and return dates. It also searches for up to six specified and alternate departure and return airports.

Navitaire offers its SkyPrice solution for RM, while revenue and yield management is an integral part of HITT's CranePax product.

Revenue integrity & leakage

Revenue integrity or protection is the process of ensuring that the correct fares and pricing rules have been applied, and that fake and unticketed bookings, or double bookings that are unlikely to be ticketed, are cancelled.

Amadeus has robots that clean up inventory. These analyse all bookings to verify that correct fare rules have been used, and search for bookings with fake or suspect names, and bookings in the same name on the same or close flights.

Amadeus' Altea Departure Control is available as licensed software only, and has multiple capabilities.

There are two composites within its revenue leakage solutions: Revenue Integrity, which is used to check for fake bookings and bookings made with bad fare rules to minimise the amount of no-shows; and Ticket Changer, which automatically scans bookings to ensure that all tickets have been sold using the correct fare rules. Some errors occur when tickets are changed, but ticket rules are also deliberately broken.

Calidris is a vendor that specialises in revenue leakage and integrity products. It works in partnership with Mercator, which uses and markets the Calidris product for revenue integrity as part of Mercator's Jupiter I product.

The Calidris revenue leakage product, Calidris Integrity, analyses bookings for broken fare rules, accidental problems like duplicate bookings, and deliberate abuse. This latter group can include fake names used by travel agents that have tried to maximise their number of GDS bookings. Calidris Integrity works with a database of fake or suspect names, such as Mickey Mouse, so it can cancel bookings with these names. It also uses a database of rogue travel agents, who have made a high number of fake or duplicate bookings, so that these can be refused by the airline. The Calidris system can also analyse automatic bookings that have been manually overridden, an indication that fare rules have been violated. With this information, airlines can charge travel agents for the difference between correct and incorrect fares.

The Calidris system also keeps a database of people that have a record of stealing credit cards.

Calidris Integrity is available in five modules: Booking Integrity, Customer Integrity, Distribution Integrity, Ticket Integrity, and Passenger Integrity.

Kale Consultants is another specialist provider which has a revenue accounting solution as its core product. This comes with a revenue integrity and auditing capability that audits GDS booking fees to check their viability, and bookings to see if there are any leakage or integrity issues. It also checks for duplicate bookings made through GDSs.

Lufthansa Systems' Revenue Integrity product is designed to minimise the difference between calculated and actually achieved revenue. It provides accurate data on bookings, and allows additional revenues from seats coming

The screenshot displays the Altea Departure Control Flight Management UAT - Flight Information interface. At the top, it shows flight details: 6X889, 01SEP, LHR-SIN+, S1800 D, and ACARS. Below this, there are various tabs and buttons for flight management, including 'Deadload', 'Load Distribution', 'Fuel', 'Passenger', 'Documents', and 'Messenger'. The main area is divided into several sections:

- My Flights:** A sidebar on the left showing a list of flights with status indicators (e.g., 'OK', 'Cancel', 'No Show').
- Aircraft Information:** A central section for flight 6X-YGA, showing registration, aircraft subtype (74K), routing (LHR-SIN), departure time (01SEP 51800L), arrival, fitted interval (14F/30J/30W/26J4), and aircraft location (GTE 3).
- Basic Weight Table:** A table showing weight components and their values.

Component	Value	Weight	Value
Basic Weight	179 400	590.00	3UJ
+ Passengers	A	9 000	-44.20
+ Crew	4/12	1 560	-6.97
+ SWA		2 500	-16.67
+ Ballast/Trapped Fuel	0	0.00	3UJ
DOW	192 460	621.98	3UJ
+ Traffic Load		26 751	
ZFW	219 211	MZFW: 246 758	
+ Usable Fuel	95 000		
- Taxi Fuel	500		
TOW	273 711	MTOW: 394 628	
- Trip Fuel	46 000		
LWR	227 711	MLWR: 285 758	
Actual Underload	27 539		
- To Come Weight	0		
Predicted Underload	27 539		
- Messages:** A section at the bottom showing a list of messages with timestamps and content, such as 'Load Control Closed - Approve Distribution completed'.
- Centre Of Gravity:** A graph on the right side showing the center of gravity over time.

available due to cancellations. It claims to save airlines an average of one Euro per seat on each segment.

Sabre's SmartFlow product can be used by airlines to develop their own revenue integrity processes, but it also provides standard revenue integrity processes to find bookings not ticketed within certain time limits as allowed by fare rules, using a robotic system that searches for unticketed bookings by PNR. SmartFlow also gives a graphical snapshot of all inventory from GDSs, airline host systems, databases and web services to provide an accurate picture of available inventory closer to departure, which can then be sold to generate additional revenue. SmartFlow can also be used for wait list management, and downline segment cancellation.

SITA's Revenue Integrity product eliminates unproductive bookings as soon as they are made, thereby maximising availability while demand is still strong. By minimising revenue leakage the quality of forecasting data is also improved. This leads to reduced GDS fees by the cancellation of duplicate, fake and waitlisted bookings prior to departure. Customers have a menu of up to 12 revenue integrity processes that can be configured to meet specific requirements.

Travelport's Fares & Pricing RM product includes various revenue protection tools, including Rapid Reprice, Fare Verified and Ticket To Confirm. Rapid Reprice automatically checks that fare rules have been followed for every distribution channel, and automatically recalculates fares when itineraries are changed or cancelled. Fare Verified proactively conducts fare audits and takes preventative action to stop revenue

leakage. It claims to have the broadest fare-audit capability to prevent revenue losses before ticketing occurs. Ticket To Confirm maximises inventory utilisation, reading the airline's fare rules to ensure that unticketed bookings, and those not ticketed in the permitted time, are processed correctly, thereby maintaining accurate inventory levels.

Navitaire's revenue integrity product is its fully hosted Sales Audit Services. It is used by global airlines to ensure that travel agents have used correct fare rules and taxes, and claimed the correct commissions. The system helps airlines recover lost revenue and provides them with analytical information.

Air Logica is a specialist provider, which has several products. The first is Flash, which audits GDSs' costs, fees for fake and duplicate bookings, and payment validations. It also analyses GDS booking data to see if an airline's GDS strategies are working.

Customer loyalty

Customer loyalty involves FF programmes and customer relationship management (CRM). Solutions are provided by the large vendors, as well as specialist providers.

Amadeus offers two products for FF Programmes: Customer Loyalty for small and medium-sized airlines; and BLS for large airlines. Both products manage FF points in terms of record-keeping, allowing and monitoring usage. Amadeus does not have a CRM product, although its Altea Reservation system does use ranking from other CRM systems to adapt treatment of customers.

HITIT's flagship product is Crane FF,



which is used by 16 airlines, including Virgin Blue, Etihad and Qatar Airways. Crane FF is also used for CRM and passenger loyalty. Features include: Crane 4C, which allows airlines to track every piece of passenger correspondence so that passengers get a response to all communication with the airline; the user module, which is used by airline loyalty departments; the Admin module for ensuring rules with business partners such as hotels are adhered to; and the Reporting module for management decisions.

HITIT also offers Crane Intelligent Member Profiles (IMP). This is used in passenger loyalty to provide information on FF programme members, and can be used for targeting passengers for specific campaigns. This allows correlations in passengers' buying behaviour to be made.

Lufthansa Systems' FrequentLine has three modules for managing individual customers, corporate clients and travel agents.

Another of Mercator's products is CRIS used for CRM and FF programmes. This can be integrated with its MARS, MACS and Tik Aero products.

Sabre offers Sabre Loyalty Suite for managing FF and passenger loyalty programmes, which comprises Traveler Loyalty for individual customers, and Corporate Loyalty for corporate ones. These two products track FF accounts, manage bonuses and awards, offer promotional and direct marketing capabilities, and provide reports for marketing analysis.

SITA offers its Frequent Flyer product either as licensed software or via an application service provider (ASP) platform. It caters for mileage systems based on cabin classes travelled, and

points systems, which are based on ticket fare class and the price paid.

Travelport's Award Travel application is based on its e-pricing technology.

Navitaire offers its Navitaire Loyalty products for FF programme management and CRM and passenger loyalty.

Check-in & departure control

Check-in and the DCS are one of the core functionalities of the passenger sale and handling process, so it is offered by all the large vendors. DCS has to communicate with inventory management, FF and CRM, and revenue accounting modules.

DCS systems have been developed in recent years to include more ways of checking passengers. These include self-service kiosks and web-based check-in.

Airlines are now using check-in and departure-lounge time as opportunities to market and sell additional products and services offered by themselves and third parties to passengers. This includes ancillary revenue services, so DCS systems have to communicate with these modules as well.

Amadeus's DCS product is Altea Departure Control, but it provides licensed software only.

HITIT offers Crane DCS, a web-based check-in and DCS system, that can be included as a module in its Crane Pax product. Crane DCS can also be used in check-in kiosks.

Lufthansa Systems' GroundSolutions platform comprises the complete range of check-in modules including desk, web, kiosk and mobile check-in, as well as a passenger boarding system. Airlines can pick modules or the complete integrated suite.

DCS systems have had to adapt to include new check-in systems such as web-based check-in and self-service kiosks.

Mercator's Airport Control System (MACS) is a hosted product and provides a modern check-in and aircraft load system that integrates with its MARS product. MACS allows easy and fast check-in, allows advance aircraft-load planning to handle widebody aircraft, has a baggage reconciliation capability and an inter-airline through-check-in to other DCS systems, and can be connected to self-service machines.

Sabre provides check-in and DCS as an integral part and module of its SabreSonic reservations system. SabreSonic Check-in has passenger-handling functionalities that allow web, kiosk, mobile, curbside, roving, desk, and gate check-in. Functionalities also include automated fee collection.

SITA offers three basic products in this area. The first is Departure Control Services for conventional check-in of passengers. The second is Passenger Fastcheck which provides self-service check-in kiosks. The third is PassengerWeb Check-in, which allows passengers to check in over the internet.

Travelport has a fully integrated passenger management system called Travelport Meridian. As well as reservations and inventory modules, it has a DCS module with an enhanced graphical user interface that integrates its new weight and balance system into an internet browser. This allows users to update seats and other information by just pointing, and gives check-in agents the ability to scan passports into the DCS. Travelport Meridian can also interface with a variety of kiosks.

Navitaire offers check-in and DCS as an integral part of its New Skies and Open Skies product suites for simple and low-cost airlines. While it does not offer kiosk hardware, it has extensive web services to integrate with all types of self-service tools.

An example of a specialised check-in product is Aviiit's Avicheck. This is a handheld, portable and wireless platform that can be used by airline staff as an alternative to kiosks to remotely check in passengers. This will appeal to airlines operating at airports with limited floor space or check-in infrastructure. Avicheck is also able to integrate with an airline's upselling and merchandising so that check-in staff can offer ancillary services. Avicheck can print boarding passes with a mobile printer, but it needs a live on-line system to work. This adds the capability

While self-service kiosks are now commonplace, further developments in passenger check-in include handheld check-in devices used by airline ground staff. Not only do these increase effective check-in infrastructure, they also provide airlines with the ability to merchandise their own ancillary products.

to process live credit card transactions, thereby making upselling possible. Avicheck can also be used on the aircraft in conjunction with a mobile phone provider or a satellite link, for airlines to sell or re-issue tickets, and sell upgrades and ancillary products such as hotel reservations. Avicheck is available to airlines on a simple monthly fee, without commission charges, for the hardware, software and technical support.

Revenue accounting

Revenue accounting is a module provided by some, mainly big, vendors, but also a few specialists. Like DCS, it is a core part of the traditional passenger sales process.

Kale Consultants is a specialist provider of revenue accounting services. Its product Revera is available as a hosted service, as licensed software, or as a fully outsourced service. Revenue accounting involves several processes that include reconciling sales records, pro-rating interline fares, reconciling taxes and tariffs, issuing refunds, and reporting sales revenue. Kale Consultants also offer revenue accounting as a third-party service, and combine it with business and market intelligence services, and some revenue leakage and auditing services.

Lufthansa Systems' Sirax AirFinance Platform is the first fully integrated revenue-accounting platform for airline finance departments. It is a suite of solutions that optimises all financial processes and provides key business information in real time.

Mercator's Rapid system is one of its key products. This can be integrated with its MARS, MACS and revenue integrity solutions. It also offers third-party revenue-accounting services, which are used by more than 40 airlines.

Sabre's revenue-accounting solution is Quasar, which is offered together with its SmartFlow revenue integrity solution, and provides information and data on sales, earned revenue and passenger statistics for an airline's marketing, sales and accounting areas. It provides revenue recoveries through audits of fares, commissions and interline settlements. Sabre also offers fully outsourced revenue-accounting services.

SITA offers a Passenger Revenue



Accounting solution that can provide immediate financial and statistical analysis in an on-line and real-time environment. It is available as a hosted or licensed solution, and can interface with most reservation systems and is compatible with BSP.

Softec is another specialist provider, whose Monalisa solution's functionalities relate to revenue accounting and leakage. Softec offers client/server and internet versions, and is fully hosted. Its revenue leakage functionalities include fare, tax and sales commissions audits. It will soon release an enhanced system for simplified interline settlement. It is also developing a reporting platform on revenue-accounting data for reporting and business intelligence, which is its other area of product offering. Customers include Air Berlin, Adria Airways and Air Malta.

Navitaire offers its SkyLedger solution for revenue accounting, which can be integrated with its New Skies and Open Skies reservation, SkyPrice RM and other solutions. Navitaire also offers Sales Audit Services for analysing and auditing sales data and performance.

Business intelligence

Business intelligence refers to the process whereby an airline collects data on its own sales, revenues and passenger statistics and uses them to provide information on its performance. This can be fed back to pricing, RM and scheduling modules to achieve better performance. This is a specialised service offered by a few vendors.

Calidris, which offers specialised revenue integrity and leakage solutions, also provides its business intelligence service Calidris Intelligence. This includes

a data warehouse and a front-end analysis tool. This is fully hosted, and airlines pay a monthly fee and a value share model.

Calidris analyses bookings from the information gathered by its revenue integrity capability, and distils booking data and information for analysis. It breaks down sales into regions, and analyses which sales offices are selling at highest and poorest levels.

Calidris can analyse sales in several ways, including by yields, load factors, passenger numbers, cancelled bookings and no-shows, and booking profiles. The main issue is speed, and Calidris says it can analyse and provide these data in 24-48 hours so that airlines can make full use of it.

Moreover, Calidris provides the additional detail of point of sale, flags discrepancies between bookings and ticketing, and presents the data in the same format in all areas of an airline's passenger sales process, so that airlines can drill down to details they require.

Kale Consultants provides PRISM, a business and market intelligence service. It receives data from airlines, which supply information from their revenue accounting and GDS billing data. This allows the best travel agents and passenger yields to be identified. It is also able to analyse revenue accounting data to a deep level.

Sabre offers its Air Price product, which is a fare management solution. Using robotic collection of fares from websites, it analyses fares available from competitors, and is usable for real-time and long-term decisions, so that airlines can change their pricing in a few days. Air Price is used to define air structures in each market, and it allows airlines to



follow proactive and reactive pricing strategies.

Ancillary revenues

The ability for airlines to generate revenues from ancillary products sold by themselves and third parties is developing fast. Airline products include lounge access, particular seats in the aircraft and meals. Some airlines have simplified or 'unbundled' their services and fares, and then offer these products as chargeable additions. Third-party products include car hire, hotels and travel insurance.

The process of combining ticket and ancillary product sales is known as e-commerce, and dynamic packaging on airline websites allows all products to be sold in a single transaction. Airlines receive commissions for selling third-party products through their websites.

Third-party ancillary products have more recently expanded to provide WiFi or cellular signals in an aircraft, as well as communication outside the aircraft via satellite or broadband. This allows use of mobile phones, personal digital assistants (PDAs) and the internet in the cabin. Airlines receive roaming charges for phone use via the passengers' GSM providers. Passengers can pay log-on fees for using laptops and PDAs.

The major solutions vendors now provide airlines with websites for checking schedules, seat and fare availability, making reservations, and completing transactions. They have since developed the ability to offer e-commerce and dynamic packaging technology to airlines, as well as systems for ancillary products, which include pricing rules and product inventory and availability information and data.

Amadeus offers its Airline Ancillary Services solution for an airline's own products and other products for third-party products.

Sabre addresses the sales of ancillary products through its airline website product SabreSonic Web, and through its GDS Merchandising Manager product. It also offers its Sabre Air Merchandising product that allows airlines to offer a broad range of merchandising and ancillary fare products.

AirSavings is a specialist provider of ancillary revenue solutions. Its Airline Plus product is an aggregation platform for selling third-party products, and also provides dynamic packaging capability. AirSavings has already negotiated commission rates with a range of third-party providers, so an airline can offer ancillary services just two weeks after integration with its reservation system.

AirSavings also offers Privilege Outlet, which invites passengers to an event on the internet, typically offering goods at discounted prices for a limited period. Airlines get commissions from retailers, and conversion rates are high.

Farelogix is another specialist solutions provider, which launched its FMS2 product in January 2009. FMS2 is a web-based business-rules engine for the different products an airline offers.

Modern technology now allows airlines to generate revenue from on-board sales. This is possible via communication outside the aircraft, the most common being air-to-satellite, available at different levels of bandwidth. Iridium is limited, while Inmarsat is already standard on widebodies. Ku-band, provided by Row 44, Panasonic and T-Mobile, is cheaper and has a wider bandwidth, but aircraft need new

The field of ancillary revenues is expanding to include hotels, insurance, car hire, in-flight mobile phones, in-flight internet & shopping, and advertising.

equipment.

GoGo provides its Aircell air-to-ground, wireless broadband technology via ground transmitters, so it only works over land. It is currently only available in the US, but will become available in Canada, Mexico and the Caribbean. The use of cellular phones is prohibited in the US. Aircell provides WiFi signals in the cabin for using mobile phones, the internet, and live TV on the aircraft.

Aeromobile provides a cellular signal in the aircraft that allows phones, PDAs and laptop computers with general packet radio service (GPRS) cards. This uses Inmarsat outside the aircraft. Airlines then have a roaming service in the cabin. Each mobile phone GSM provider has a charging rate to passengers. GSM companies pay Aeromobile, which pays airlines a percentage.

OnAir provides WiFi and cellular signals in the aircraft, and also uses Satcom. This makes it possible to use mobile phones and smart phones on short-haul operations, and WiFi internet on long-haul operations. Airlines generate revenue with OnAir's system in the same way they do with AeroMobile's.

Bluebox Avionics (50% owned by AviIT) offers its bluebox portable or seatback in-flight entertainment solution, which is a combination of off-the-shelf hardware and proprietary software. The bluebox system provides passengers with audiovisual services on demand; such as movies, TV, audio, emags, games and shopping. Shopping can be on or off-line; on-line if the aircraft has satcom or other means of providing an internet connection in flight. Bluebox is working with a partner company to exploit the power of its system to provide a new shopping experience for airline customers. This will enable airlines to obtain the system at a substantially reduced cost, compared to traditional methods of procuring in flight entertainment (IFE), in exchange for hosting a high quality and relevant shopping and advertising system. Shopping and advertising will be via a highly interactive catalogue in-flight with goods delivered post-flight. Airlines will gain income from renting the portable device for traditional IFE and also from shopping sales. [AC](#)

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