Investigating the latest solutions and possibilities airlines can adopt to streamline its ancillary revenue streams. Plus the capability of these solutions to increase airlines profits and yields are analysed.

Ancillary revenue solutions for the cabin

The aircraft cabin offers the potential to generate passive and active streams of ancillary revenue. These are important to airlines because their yields can now make the difference between making a profit or a loss.

Passive ancillary revenue streams are typically yielded by advertising, which is traditionally done through the inflight magazine, which is revenue-neutral or revenue-positive for most airlines.

This is because the magazine's content, distribution and publication costs have to be covered and paid for. If the revenue yielded by advertising is greater than the magazine's total production costs, then it is revenue-positive; if it is just enough to cover production costs, then the magazine is revenue-neutral.

According ICF Aviation principal, Carlos R Ozores: "Many low-cost carriers (LCCs) are advertising on their cabin tray tables and overhead lockers. Increasingly many legacy carriers and LCCs are generating advertising revenue by painting the exterior of their aircraft in special liveries that promote sporting events, movies and holiday resorts."

If an aircraft is fitted with a wireless or seatback inflight entertainment system (IFE), then digital advertising is a possible ancillary revenue stream.

In the past airlines commonly relied on duty-free sales as their primary source of active ancillary revenue. Now airlines are introducing many different dining options and upgrades, as well as offering digital retail and destination experiences.

"Airlines are offering a much wider selection of meals to better cater to diverse tastes and diets," says Ozores. "Carriers are collaborating with high street and many recognised brands. This gives passengers the feeling that the airline is offering a superior product. Furthermore, collaborating with individual brand names can differentiate a carrier from other airlines."

Zoe's Kitchen is a fast-casual food chain with headquarters in Texas. It serves dishes such as chicken salad, pasta salad, pittas and sandwiches. The chain has grown to include 203 locations across 17 states, with further plans to expand.

American Airlines has recently signed a deal with Zoe's Kitchen, giving the carrier a unique branded product. "The idea is that if it is a brand that passengers associate with, it will incentivise purchase and leverage higher yields," says Ozores.

Unique brand collaborations mean airline customer ratings are naturally improving. Passengers can order meals in advance, while booking and on the airline's app. Using digital technology to pre-order food and beverages increases sales and leverages ancillary revenue.

Seat auction

Seating upgrades have always been a rich source of airline ancillary revenue. Many airlines have, however, been selling late upgrades to first- and business-class seats well below their market value.

Plusgrade hosts a backend solution that interfaces with the airline's online booking and reservation pages. The airline sets the criteria and minimum reserve price for unsold first- and business-class seats. Passengers that have purchased economy or premium seats can bid on the auction for the chance to buy an upgrade.

"Empty seats in business or first class translate to spoilt inventory. Auctioning makes it is possible for the airline to monetise these empty seats without diluting their worth," says Ozores. "If there is a flight with a lot of availability in first or business class, then the airline will set a base price that they are willing to accept for those seats."

In the past consumers' buying behaviour was influenced because they knew it was always possible to buy a heavily discounted business-class ticket at the last minute. Therefore, instead of booking in advance and paying market value for an upgrade, many passengers will wait until prices are lowered.

"If carriers reduce the price of an upgrade before departure, it trains the market to wait and get the best deal. Ideally airlines want customers to think they will get the best deal the earlier they book," Ozores explains.

The auction of an upgrade encourages passenger expenditure. Introducing a low threshold upgrade price prompts consumers to want to take part in the auction.

AeroMexico has reported it has generated twice as much upgrade revenue in a year since using the Plusgrade solution. SAS has reported a 22% increase, while Royal Brunei Airlines has noticed a 18% increase in business-class load factors during a five-month period.

Economy sky couch

Air New Zealand has created a seat upgrade called Economy Skycouch. Installed on selected Air New Zealand 777s and 787s, Economy Skycouch is a row of three economy seats that can be transformed into a couch or bed for two passengers.

Economy Skycouch gives passengers extra space and provides significant gains in comfort over a standard economy seat. "This generates additional revenue, because there is a premium to book the seat. Most Air New Zealand long-haul flights are more than 16 hours, which

Many airlines are working with advertisers and partners to create unique aircraft paint schemes. These special designs are typically sponsored by movies, sporting events or holiday resorts.

translates to high demand for a sleeper-style seat in economy class," says Ozores.

The airline has to make an assessment against the revenue generated by selling two Economy Skycouch tickets rather than three standard economy tickets. Ultimately the airline must yield a higher revenue selling Economy Skycouch tickets than it does at the standard fare.

According to Ozores, if a flight is at capacity, the price of Economy Skycouch is expected to increase at a higher rate to cover the costs. Low demand flights mean that the fare for Economy Skycouch can be dropped, yet still generate a higher yield.

Deepseater

All airlines must make a significant amount of money from ticket revenue because it is their core business. A rising number of airlines is unbundling fares, so there is now a higher impetus on carriers to maximise ancillary revenue yields.

Ancillary revenue is worth $93 billion per year; $12 billion of this is derived from passengers paying for seating allocation.

Carriers spend a lot of time and resources optimising ticket revenue, yet do little to augment ancillary revenue. Typically, carriers will amend ticket prices regularly to ensure they are selling them for the optimal rate. Dynamic pricing is the reason air fares change at short notice.

Dynamic pricing

American Airlines changes about 500,000 ticket prices daily. Sometimes prices for the same service class will rise or fall multiple times over several days. Carriers have to sell the highest number of seats for all flights at the highest possible price to improve yield mix. It is inefficient if an aircraft operates with only a small number of expensive tickets sold, or with a high number of cheap tickets sold. It is a balancing act to sell the maximum amount of tickets for the highest price possible.

Dynamic pricing reacts to demand and the speed at which tickets sell, as well as operational factors such as fuel prices. If prices constantly rise nearer the day of departure, many price-sensitive consumers will not buy tickets. This is not the case for business travellers, whose schedules mean they must travel at specific dates and times.

Typically, ancillary revenue items use a static pricing structure; meaning their prices are fixed and change infrequently.

Christian Spann, senior analyst, zeroG says: "If you look at a typical legacy hub carrier, about 10% of the total airline revenue will be generated from non-ticket ancillary sales. This is a significant yield for legacy airlines. Ancillary revenue can be higher for non-legacy airlines." Ancillaries are a fundamental revenue stream for airlines. By combining them with a flexible pricing model, they will get even more important in the future.

Therefore, zeroG, a data science subsidiary of the leading airline IT provider Lufthansa Systems, is working on approaches to tap into that potential and provide airlines with intelligent solutions.

It is forecast that Spirit Airlines will generate 50% of its total revenue through the sale of non-ticket items in 2019. This means 50 cents in every dollar yielded comes from selling additional goods and services.

One of the biggest generators for ancillary revenue onboard is from baggage initiatives. US frequent flyer credit card commissions have the highest ancillary revenue yield across the sector.

This is because light or basic airfare tickets commonly do not include check-in luggage within their price. Airlines set individual terms and conditions on their baggage fees and allowances for passengers that want to stow luggage in the aircraft's hold, or travel with extra cabin carry-on cases.

The second biggest source of ancillary revenue is seat selection, where passengers can pre-book their seat on the aircraft.

Advance seat selection can be disseminated in many ways. Different seat pricing points can apply to standard seats, economy-plus seats and window seats. For example, seats with extra legroom are priced higher than an economy seat to reflect the limited supply and higher demand. The airline specifies the price points and how they classify and value individual seats or rows of seats. LCCs can have as many as nine seating price points in a single-class cabin.

"We have developed DeepSeater based on our assumption that an airline's business model will be more willing to go into dynamic pricing for seats first before pricing bags," says Spann. "This is because choosing a seat may not be essential to a passenger, while travelling with luggage is often a necessity."

When consumers shop for a ticket, they will often compare prices with luggage. In some regions, the internet pricing tool Google Flights will factor baggage fees in its comparison results.

Many airlines aggregate the baggage prices into the ticket price for longer routes or include a luggage upgrade option. Carriers produce marketing material with ticket and baggage price points months in advance, so dynamically pricing baggage can be more challenging to implement than seat allocation.

Carriers are less transparent with the prices of individual seat selection. Yet some already implement a basic time-based pricing structure. Time-based pricing structures increase or decrease pricing points at set intervals between the ticket release date and the date of the flight. Normally the earlier a passenger

Seat bookings are among one of the highest yielding ancillary revenue streams. Dynamic pricing optimises seat pricing to create the maximum yield.

books their seat, the cheaper it will cost.

"DeepSeater adopts a three-step approach when implementing dynamic pricing to seat allocation," says Spann. "Initially data is needed to analyse the performance of an airline's seating options and the demand for pre-booking seating on individual routes during different days and months of the year."

The data provides insights as to how different markets react to advance seating bookings, and make it possible to dynamically adjust prices for different types of seats according to demand. If seats with extra legroom, or on the first row or aisle become appealing, then DeepSeater will adjust the pricing points for these seats to optimise the seat selection revenue at departure.

Next it is possible to monitor how passengers react by changing the price point parameters. Obtaining more data will add certainty to the best price that passengers are willing to spend on seat selection across the network.

Introducing an artificial intelligence (AI) agent means DeepSeater learns by itself through trial, error and correction. The price can be updated frequently, translating to the maximum allocated seating revenue across that flight.

"If travellers are not pre-allocating seats at current prices, the system will lower the price points to generate demand," says Spann. "The AI system can constantly adjust prices in real time."

It is conceivable for DeepSeater to update its price points many times during an hour. Yet how frequently price points are updated depends on the airline's strategy. "It is recommended that airlines periodically assess the price points, but do not change them so frequently that it degrades the passenger booking experience," says Spann.

Once a seat booking has been made the price will remain fixed, and will not change for that passenger.

"The price points will be more stable months before a flight's departure date because of low demand for ticket and seat allocation. It is recommended that DeepSeater reviews the price points nearer the departure date every six to eight hours," says Spann.

It is possible for the airline to set a minimum and maximum seat allocation price with the AI agent. Furthermore, it is possible to configure the system to ensure that premium-seat price points do not drop below those of economy. The AI agent will learn an airline's pricing policies over time, and intuitively know the seat pricing ladder.

Subjective combinations could be that all the standard economy seats are available, but the exit row only has a middle seat available. This seat becomes less attractive, because people would rather sit in a standard seat than a middle exit seat.

It is possible to create a sophisticated aircraft-seating pricing matrix. Least popular seats, such as the ones located close to the galley or toilet, could be priced at a reduced rate. DeepSeater can provide an individual price point for each seat on an aircraft. However, the greater the number of price-points, the more complexity is needed within the system.

DeepSeater will interface with an airline's digital commerce website and booking app. It can also disseminate special prices for passenger segmentations, such as discounted price points for families or business travellers.

Using a simple rule-based seat pricing structure that adjust prices incrementally nearer a departure date by can increase revenue by %10.

It is expected yields will be much greater using DeepSeater with AI and wider price segmentation.

Connectivity

The biggest opportunity for leveraging ancillary revenue is by inflight connectivity. Many flights across mainland Europe and the US now have access to onboard internet connections. Moreover, ever increasing bandwidth and reliability mean more passengers can successfully connect to the internet on long-haul flights.

Some US cellphone network providers are offering free unlimited inflight internet within their talk plans. This is not about selling onboard connectivity to passengers, but about airlines creating partnerships with travel experience and destination retailers and media outlets, such as Netflix.

Connectivity means that airlines can see the content passengers are viewing during the flight. This data can be used to assist the airline in hyper-personalising the inflight digital sales experience to optimise revenue. By hosting an inflight digital storefront, the airline can make a commission on each sale made.

In-flight map

According to research, onboard inflight duty-free sales have fallen by 11%. Inflight maps are popular with passengers, and can provide an original and engaging platform that can influence travellers' destination spending.

FlightPath3D leverages ancillary revenue by providing passengers with an immersive onboard 3D map experience with the functionality to let airlines sell and advertise products.

Travellers often do not have fixed plans for what they want to do at their destination, and are looking for inspiration.

FlightPath3D vice president for marketing, Jon Norris says: "Today it is not about passengers' paying for connectivity, it is about the passengers' destination spend wallet. Access to this market increases dramatically once you have connectivity."

Passenger onboard spending is moving away from the traditional duty free product and gravitating towards destination spending. Interactive onboard provides a creative way to influence passengers to book holiday attractions and excursions.

Destination shopping, experiences and services are a segment of passenger spending that is on the rise. Typical destination services can be excursions, restaurants, hotels and transportation.

The airline can embed as many destination services as it wants within the map's architecture. When the passenger is engaged in the map experience it will highlight partnered services that are available in any geographical location.

"Many airlines offer travel packages as part of their service. British Airways and American Airlines frequently advertise travel bundles that include hotels and hire cars. It is possible to integrate any permutations of these offers into the map," says Norris. "It is possible to add any product that can be linked by a geolocation to the map."

Therefore, if a passenger is using the map to browse around the London area, they will be informed of numerous attractions within the city. Furthermore, the map will enable the traveller to book and pay for the experience they choose.

"If I am looking at Big Red Bus tours around San Francisco, then I just click on the secure link to the Big Red Bus booking engine for information on tours, availability and pricing," says Norris.

Flightpath3D uses data in the public domain, so it can suggest relevant destination services based on what the passenger is viewing during the flight. "If you have been browsing the San Francisco area, the map will use this data to recommend destination services for the passengers," says Norris.

FlightPath3D map can add context to the customer retail experience. By knowing where the customer is flying to or from, and analysing what the passengers are looking at on the map, it is possible to serve ideas and the airline's routes and services to the passenger.

"Instead of just randomly suggesting destinations, when they are of little relevance, FlightPath3D takes a personalised approach," says Norris. "The passenger can browse the seatback screen for a long time. This enables the airline to gather data and make the best-informed proposals to that traveller."

By analysing billions of traveller reviews, photos and other social interactions, Flightmap3D can inform passengers which destinations and activities are trending. It is possible to identify more than 400,000 attractions worldwide and see how they rank by popularity.

Routes

Most inflight magazines feature a map that shows airline routes and destinations. These can be very static and do not include much detail. FlightPath3D map will highlight destinations, as well as information about the flight and make it possible to examine the flight schedules. If the aircraft is connected, it is possible for passengers to book a future flight while onboard.

"If a traveller is on a flight from JFK to LAX, and viewing points of interests in San Francisco on the moving map, it will offer suggestions, such as the flight schedule, routes and costs. The map will suggest other attractions in San Francisco. It can be tailored as little or as much as the airline chooses," says Norris.

Passengers want their IFE experience to be immersive; they do not want to stop what they are watching to view something else. It is possible that a portion of the seatback screen may be allocated to showing the map.

If passengers are watching a film, the map can highlight information about where a particular movie scene was filmed and give background information. Alternatively, a tickertape banner at the top or bottom of the display can highlight information such as the flight time to a destination and the aircraft altitude.

Many carriers have surficial adverts in between the map display screens, or add placements on different parts of the map. These will be displayed while passengers cycle between screens or browse the map.

FlightPath3D produces an onboard map solution that can interface with the IFE seatback system and passengers' portable electronic devices (PED).

AD power

The widespread introduction of wireless IFE systems means that its centricity is gravitating away from seatback display systems to PEDs. It has been forecast that by 2028 there will be 14,000 aircraft installed with wireless IFE systems. Of this number it is expected that 11,500 will be narrowbody aircraft.

Travellers rely on their PEDs for a multitude of tasks such as arranging airport transfers, obtaining directions and contacting friends and relatives. Travellers will therefore seek to recharge their PEDs when they are onboard.

Most wireless IFE systems include a USB port installed in each seat to enable the passenger to recharge their PEDs inflight. This means that passengers can have continued access to the IFE system, without their PED running out of power.

Dave Phillips, head of business development IFPL, says: "Most passengers like to use and charge their PED onboard the aircraft. IFPL has a solution that triggers an advert of the airline's choice on the passenger's PED when they plug it into in-seat USB socket."

The in-seat USB outlet is managed by the airline App. When the passenger connects their PED, the App messages the USB outlet an encrypted payment token. Once the advert has been watched, the token will activate and in-seat USB power will be enabled.

For short flights it is recommended

Economy Skycouch is a row of three economy seats that can be transformed into a couch or bed for two passengers. Airlines must make pricing assessments between selling two seats against three.

that the system circulates one advert. For longer flights it is recommended that an advert is activated every time a passenger plugs into the USB outlet.

Ad Power can make it possible for the airline to levy passenger access to in-seat USB power. Passengers can buy in-seat power when they book their ticket online. Once purchased, metadata will be sent from the digital booking platform to the passenger's app. When the passenger connects their device to the USB, in-seat power will activate immediately.

"If a carrier charges two dollars per passenger, a 20% uptake on a 180-seat aircraft will yield $74.40," says Phillips. "An aircraft that flies six sectors a day will yield $446.40 per day. If the aircraft is operating for 330 days per year, the total yield will be $147,000."

Payment can be made by airmiles or vouchers. The ability to levy for in-seat power means that airlines can diversify their service class. For instance, in-seat power could be provided free as part of a business-class and premium-economy package. Furthermore, it is possible to run promotions and incentives with partnered brands.

Ad Power is compatible with Apple and Android devices, and will integrate with current airline IFE equipment.

Fethr

One of the key issues is how airlines can improve ancillary yields seamlessly without endangering the passenger's core experience by offering products they do not want.

It is always possible to increase prices or to market and monetise a multitude of items, such as baggage and beverages to boost revenue. But commoditising can have a negative impact on customer experience and brand loyalty.

Fethr works with the aviation and travel sector to convert raw data into profit. By using a data-positive approach, it is possible to reduce wastage and increase customer satisfaction, which has a direct impact on ancillary revenue.

Social data is a new channel that can be used to get a better understanding, without having some of the negatives associated with Net Promoter Scores (NPS). Many airlines use NPS to gauge the loyalty of their passengers and how well they are. NPS scores are based on a customer satisfaction survey that is calculated against customer responses to single questions.

Fethr uses social data to increase ancillary revenue by highlighting the passenger's voice for many different parts of the overall passenger experience. The data is used to predict what passengers want so that airlines can tailor their products to them, hence increasing ancillary revenue while increasing the customer satisfaction score.

Social data is information that social media users publicly share. Platforms rich with social data are Facebook, Twitter and Instagram. Other sources can be internet forums, chats and video blogging sites such as Youtube and Vimeo.

Analysing social data allows airlines to get closer to the moment, and get some predictive points of view about the customer experience and how it is resonating with airlines.

According to Fethr insights director, Will Cooper: "It is about informing airlines and getting them to be more proactive in their approach, so that they can better decide which services and products to provide, based on a thorough understanding of what is important to its passengers and how to better cater for their needs."

Advantages in using social data is that it is accessible in the public domain. Therefore, there is nothing preventing Fethr from performing analytics on it and informing operators how they are performing.

Subsequently, Fethr can perform analytics on competitor's social data, so it is possible to learn the performance of a competitor. These insights are useful; by using them it is possible to gain a commercial advantage and know what a competitor is doing well.

"We let the data dictate what we talk to our airlines about, so we do not apply any pre-existing hypothesis at the first stage," says Cooper. "We spend time calculating what is important to passengers. If it is important, passengers will be talking about it online."

It is important to understand the context of the social data. Influences that drive customer satisfaction for a European LCC are different to a long-haul legacy airline passenger. Therefore when the context changes, the passenger needs change.

The system will not compare airlines against each other. "For example, it would not make sense to compare easyJet against Emirates, because each has very different missions," says Cooper. "We relate bespoke social data insights to each individual case. We do not apply any bias into the data; we let the data speak for itself. The sample size of the data can vary between airlines, but all the data sets are of a significant size to analyse, which means that airlines with smaller data sets are not penalised."

There are processes in place to ensure that when the data is imported it is enriched and cleaned to guarantee that the relevant conversations are being identified. One of the major investments Fethr put into building the dataset is to ensure that the solution is accurate and effective at isolating conversations pertaining to the airline.

Cleansing the data increases its validity and its robustness, so if passengers are talking about an airline purchase it is possible to identify where and how that purchase was made.

Fethr implements both social listening

Wireless connectivity solutions transmit content to passenger mobile devices without the need of a seatback screen. Ad Power makes it possible to levy passenger usage of the in-seat USB power supply.

and social prediction, which uses comprehensive algorithms to enable the solution to model and predict customer requirements, expectations and wants.

Social listening is very-in-the-moment, so it is more about what is trending and what users' sentiments are. Social listening applies pre-defined search terms to see what conversation exists around those search terms.

Social prediction requires looking at trends that are occurring now on the ground and how they will manifest in the aviation and travel sector in the future.

Duc Huy Tran, Fethr head of strategy, says: "Social prediction is much more actionable for airlines so they can prioritise. One of the biggest problems airlines have is that they have so many decisions, and it is difficult for them to know the impact of a product on NPS. In the end, they want a tool to be able to prioritise their offerings."

There are many areas where the solution can leverage ancillary revenue. One of these is around looking at what the future of inflight retailing should be from a passenger experience perspective. Insights to passenger expectations mean it is possible to predict how passengers want to shop and what products they would like to consume. It is possible to gain insights from a wide range of topics from passenger paying preferences, to what the ideal airline user interface should look like.

There are many areas the solution can look at, One of these areas is what the future of inflight retailing should be from a passenger experience perspective. How do passengers want to shop, how do they want to pay, and what do they want passenger user interfaces to look like?

"Broadly speaking, we are noticing a tangible shift in what passengers would like to buy onboard," says Cooper. "Passengers are buying traditional duty-free items in the airport, such as perfume, alcohol and cigarettes. On the aircraft passengers are increasingly buying destination services and experiences."

Airlines now have the opportunity to drive these types of services, and to invest in destination services. Insights to what products passengers will want to buy mean airlines can pick the products and services passengers want.

It is possible to predict what ancillary products and services passengers will want in the future. Fethr has conducted research, such as which movie titles should be uploaded onto the aircraft.

For food and beverage, Fethr is working with airlines to determine what passengers are enjoying eating today, and how tastes will evolve. By analysing growing dietary and wellness trends, the solution will predict what passengers will want to eat and drink in the future.

Detailed insights into passenger requirements mean it is advantageous when negotiating tenders with suppliers and retailers for future product selections.

"Airlines will be optimising their ancillary inventory because they will know what products passengers want to purchase and consume," says Cooper. "Knowing the optimum inflight inventory inherently improves operational economics by not throwing away food that passengers did not consume."

When analysing trends, it is important to determine how the online conversation is working in relation to the aviation set. For instance, if trends were only taking place from insights happening on the ground, then it is likely airlines will stock the wrong food items.

"Because passenger needs can be unique, sometimes items that are trending on the ground do not trend in the air," says Cooper. "While on the ground passengers may want to eat very healthily, but within the inflight experience they may want to indulge a bit. Viewed as a time to relax, many normally health-conscious passengers will reward themselves with less healthy foods."

When it comes to analysing conversation, context is key. Short- and long-haul flights will have different passenger needs.

Some passengers would like an authentic dining experience that reflects the destination that they are travelling to, while others would prefer more variety in the children's food menu. Passengers may simply want a coffee for short regional flights.

Passengers will spend more money if they are presented with items that they want to consume. By concentrating on this, it is possible to improve passenger experience, loyalty and revenue.

Convenience

Opportunities to create ancillary revenue can be attractive to passengers because of their ability to benefit the passenger in terms of time saving and convenience.

Passenger convenience significantly more important now that it was three years ago. Research suggest that consumers who are stimulated to order ahead of their flight are the passengers who spend wallet is the highest.

Furthermore, the ability to shop from an App to be able to collect the purchase from the destination airport on hotel is increasingly becoming a higher priority for these passengers.

Therefore, to drive ancillary revenue in the future airlines need to focus on passenger solution offer passengers tangible time saving and convenience.

Because of the time and convenience saving, passengers are more willing to pay a higher price for these products and services. This means that products need not be heavily discounted in order to incentivise buyers.