Airline Industry Retailing (AIR)
Think Tank
2021
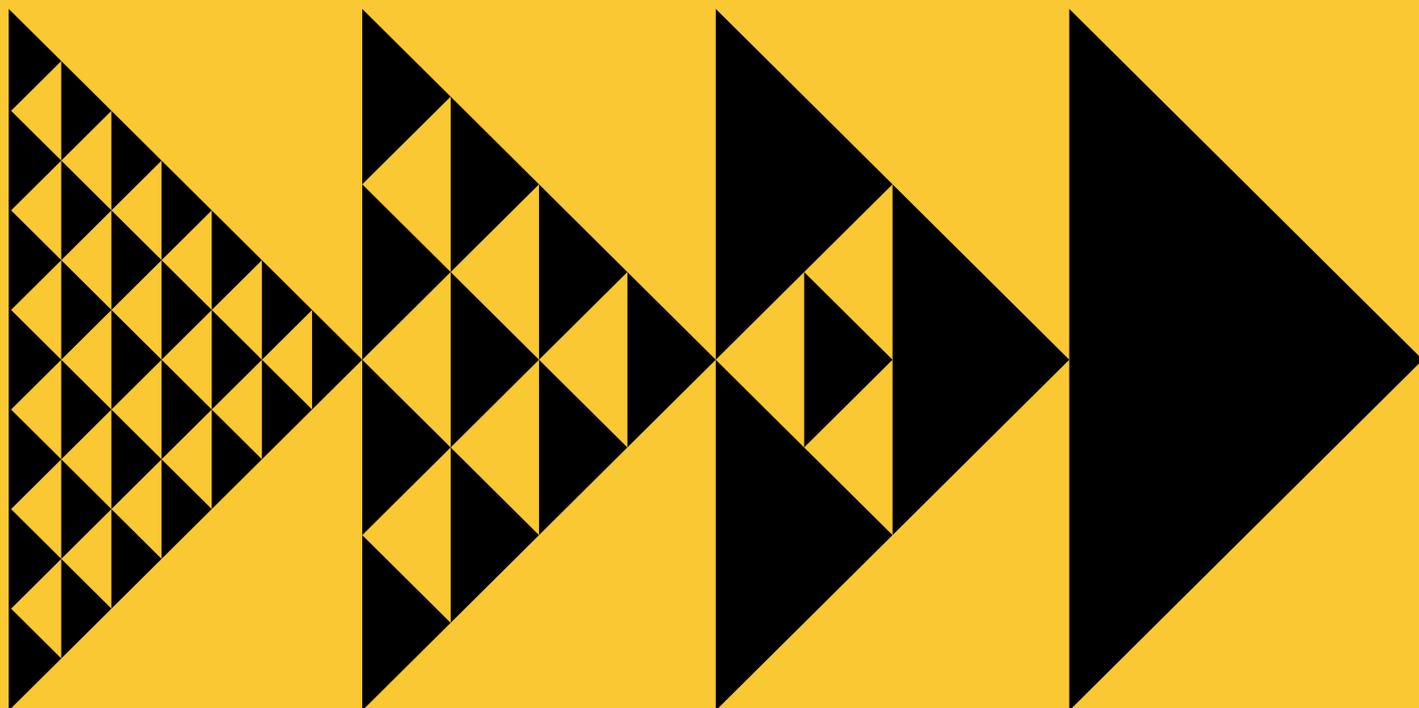
Foreword

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Several years ago, with the support of the industry, IATA embarked on a journey towards airline retailing which consisted of the modernization of airline distribution through projects such as NDC, Dynamic Offer Creation, ONE Order etc. The purpose of this journey continues to be to provide for a true customer centric industry, maximizing airline value creation.

Despite the catastrophic downturn in air travel caused by the COVID-19 pandemic, this industry drive toward airline retailing has in fact accelerated. This has been seen through the Leaderboard airlines exceeding their target (20% of indirect sales via NDC by December 2020) and for example the NDC and ONE Order certifications growing to over 220 players, which represents an increase of 20% in the last 18 months. Furthermore, all the major technology providers as well as a large number of start-ups have maintained airline retailing on their strategic roadmap. These are clear indicators that despite the crisis, airlines and their partners have maintained their focus on customer centricity enabled by digital transformation.

Adapting the airline industry to the retailing world is possibly one of the most important transformational projects of the next decade. The COVID-19 crisis has not only severely disrupted our industry, but it has also emphasized the need for much greater customer centricity.

This year the Think Tank has focused on three areas that can improve the customer experience. First, an improved overall airport experience. If we assume that people coming to the airport at different times of the day or at different times prior to flight departure have different needs, then we can improve customer experience by designing better ways to match demand and supply of goods and services at the airport. Second, by deconstructing the travel industry into "lego-style" building blocks of capabilities and constituting a decentralized ecosystem where suppliers can participate easily, and that can be accessed by any player with little to no friction, we can make it more flexible, remove barriers and provide a more resilient end-to-end experience to the customer. Finally, how about using "Retailing Intelligence" to anticipate the customer experience based on previous, current and potential future activities?

As it has been the case for many editions now, we look forward to some fruitful discussions around these ideas and, why not, some cool implementations!

Executive Summary

Airline retailing is a key topic for the industry and airlines are focusing on retail and distribution innovation more than ever. The AIR Think Tank has been running annually for the past few years. Since its launch in 2018, the team is focused on brainstorming and designing ideas with the aim to transform airlines into retailers.

This year, the team has worked on the following ideas:

1. Clairvoyant

2. Construct-o-matic

3. Window of the future

The ideas are articulated within this paper and will be presented at the 2021 IATA Digital, Data and Retailing Symposium.

Overview of content

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AIR overview

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AIR overview

In a digital world, airline customers' expectations for personalized offers, real-time information and seamless transactions are growing. Airline retailing could move airline distribution to the future through de-commoditization, selling new products in new ways, and being closer to the customers. It will enable richer customer engagement and dynamic offers to be created, ordered and fulfilled all along the journey.

Airline retailing is a critical source of value creation for airlines. According to a recent McKinsey report, airline retailing has an industry value creation potential of up to USD $7 per passenger industry average or equivalent of approximately 4% revenue.

Airline retailing is customer-centric

Airline retailing is about bringing the customer at the center of the ecosystem. It is also about personalization of content and letting travelers enjoy their choice of services throughout their journey at every single touchpoint.

Airline retailing creates value in five ways:

1 Developments of New Offers

2 Enhanced Revenue Management

3 Optimized Distribution Mix

4 Better Customer Targeting and Engagement

5 Optimized Payment and Fulfilment

Activities

Business travel summit

Over the past few years, this summit has been the unique event bringing together decision makers from across the business travel value chain to discuss airline retailing, live NDC integrations and how to drive the industry forward. This year, the event was held virtually with a shift of focus on 1) Restart and rethink travel and 2) value creation in airline retailing by the industry.

Find out more at iata.org/en/events/business-travel-summit.

Digital, Data and Retailing Symposium

This year, the Airline Industry Retailing Symposium (AIRS) and the Aviation Data Symposium (ADS) will be held at the same time and place under a brand-new name: Digital, Data and Retailing Symposium (DDR). The focus will be on the industry restart plan and how airlines can further reduce costs and plan for new revenue generation using the power of data and retailing.

Find out more at iata.org/en/events/retail-symposium-air.

Retailing implementation forums

In 2021, a few implementation forums were held virtually. IATA has also produced a series of retail implementation webinars highlighting topics on the minds of implementers who are live and who are demonstrating value on their retail journey.

See at airtechzone.iata.org/community/events/#jul_21.

Dynamic offers forums

IATA introduced the dynamic offers program at the IATA AIR Symposium in October 2019. Supported by the industry and the IATA Distribution Advisory Council (DAC), this forum aims to keep alignment towards the industry restart and the airline retailing vision, while providing an open discussions platform for airlines and their IT vendors in the context of the transformation agenda towards an air retailing world of pure offers and orders.

See at iata.org/en/programs/airline-distribution/dynamic-offers.

2021 New ideas

1. Clairvoyant

2. Construct-o-matic
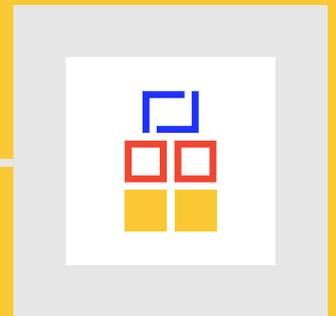
3. Window of the future
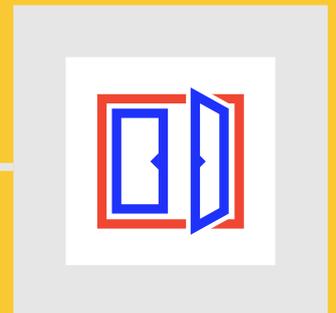
2021 New ideas

1. Clairvoyant

Vision

Foreseeing demand and supply of goods and services by considering time of day, traveler profile, routine, and preferences to better meet customer needs pre- and post-flight, resulting in an improved airport experience and overall customer journey satisfaction.

Vision description

Just as a skilled fortune teller reads and picks up signals to tell her client what that person wants to hear; good customer experience design is surprisingly similar in that it requires practical, cultural, social, emotional intelligence, in addition to a lot of good data. Data is what we need to tap into to make us good fortune tellers, or rather good product and service providers.

It was said that when a delegate from the UAE visited Japan back in 2014, they were so impressed with the Japanese convenience stores that they decided to open one in Dubai the following year. Store space of most Japanese convenience stores is usually very limited such that many stores must stock different items at different times of the day as well as different days of the week to ensure that they meet customer demand and do not run out of stock. Not only do stores use sales data to decide on what items to replenish at what time of the day, they also gather contextual information on local events. For example, a store near a school, knowing that there will be a Sports Day event at the school on the coming weekend, will stock more lunch bento boxes.

The same idea can be applied to airports. If we assume that people coming to the airport at different times of the day or at different times prior to flight departure have different needs, then given the information as to what those needs are and the extent to which they can or cannot be met, then we can improve customer experience by designing better ways to match demand and supply of goods and services at the airport. The table below illustrates an example of several hypothetical traveler segments and their unmet needs.

Segment	Behavior	Unmet needs
Early risers who wake up very early in the morning to catch a morning flight	• Prefer to arrive at the airport as late as possible and not have to worry about missing the flight. • A zero-queue coffee stand near the boarding gate would be nice!	• Airport not fully staffed because of early hour, and hence long queues at check-in and security. • No time for coffee before boarding,
Airport heavy users who plan to spend time at the airport before the flight boards	• I must buy something at the duty-free shop. • I must use the lounge as that's my privilege. • I must have sushi as this will be my last Japanese meal.	• Not certain whether the item I want is available at the airport DFS, hence, maybe better to shop in the city. • But then I will need to queue for GST refund.
Ritual observers who hate to have their routine disrupted	• I need to take a hot shower and change into comfortable clothes before getting on a red-eye flight.	• Limited facilities. Often expensive or long waiting time.
Wee hours transit doers who need to wait for 3 hours before the connecting flight starts boarding	• It is 3am and I just want to sleep until boarding starts.	• All seats at the deserted boarding gate area have arm rests, without which I could have lied down and dozed off for an hour or two.

2021 New ideas

1. Clairvoyant

Airlines have a vested interest in their customers' experiences at the airport before and after their flights. Prior to boarding a flight, a customer's interactions at the airport can affect their mood once onboard; for example, waiting in a long queue for a coffee, then running to the gate to board the flight can leave a customer tired and frustrated. These emotions can negatively affect their perception of inflight service and exacerbate their reactions to events, such as delays. Whereas a scenario in which they punctually received their coffee, returned to the gate at a normal pace, and boarded the plane with their assigned group puts the customer in a more relaxed and amenable disposition. When the airline sends a post-travel survey, customers who had a more pleasant end-to-end journey will typically respond in a more positive way.

With having better data available, we should at least be able to have passengers be better informed so that they can set the right expectations and be better prepared. We can also use data to reconfigure many facilities and services at the airport to better match traveler needs. This paper describes an idea that aims to resolve the issue of unmet customer needs in airport related services such as retail experience.

Current situation

Most airports face enormous challenges when it comes to meeting passenger needs. Reasons range from actual passenger throughput outgrowing the terminal's designed capacity, discrepancy between terminal design and actual usage, the difficulty of simulating visual representation of passenger movements and activities, insufficient information and hence awareness around unmet customer needs, and many other factors.

As a result of a large gap between design and actual usage, demand and supply, as well as a lack of information around it, passengers arriving at the airport often must settle with a second best alternative or be disappointed in not being able to have access to products and services they need. And it is not just the retail experience, but many other related pain points too such long queues and waiting time that could be reduced by having pre-clearance, dilemma of shopping in the city or at the airport because of uncertainly around product availability, not knowing how to best use waiting time, underutilised accessibility channel for disabled passengers and so forth, many of which could be improved by utilising data that we already have, or with data we can capture by installing devices such as movement tracking and digital twin.

Airports in the US, the Netherlands, Hong Kong and Singapore have started using digital twins to show what is happening in real time, as well as to replay a moment in the past to observe exactly what has happened, such as terminal passenger flow during irregular operations. This has helped airports understand both in a granular level and holistically how to improve operations and to also run simulations on design improvements without having to conduct live trials which can be both costly and risky. Although technologies such as high-resolution Laser imaging Detection and Ranging (LiDAR) image recognition sensors and IoT can be used to digitally reconstruct a representation of ongoing changes that are happening real time at an airport, they may not be suitable for resolving the issue of unmet customer needs in airport related services. Cameras can capture queue length and waiting time, and out of stock data may be extracted from retails stores' inventory systems, but that alone not would be able to identify occurrences of unmet customer needs. We therefore need a different kind of solution.

2021 New ideas

1. Clairvoyant

Case for change / recommendations

To improve the current situation, we propose considering the following six ideas as described below.

Idea 1: Use "no" as the wake word in voice IoT to identify unmet customer needs

If sensors used in IoT can pick up voice to create a voice IoT, then a simple idea would be to use that to identify situations when a service provider has uttered the word "no" in response to a customer request. This is because the word "no" is a signal that a customer might have a need which a service provider cannot currently satisfy. Insights derived this could then be used to improve the customer experience.

Using anonymized speech recognition technology, we can break down audio into individual sounds and convert them into a digital format. This is done by using an analog-to-digital converter (ADC) which translates sound waves to digital data. We can then use machine learning and algorithm models such as the Hidden Markov Model or deep neural networks to find the most probable fit in that language.

Just as Amazon's Alexa recognizes a command when a sentence begins with Alexa, where the word Alexa is set as the wake word, similarly, we can set the word "no" in multiple languages as the wake word so as to detect conversation in an airport service setting that contains the word "no". Because this will need to work in a noisy background, we will break down sentences into short time intervals and use machine learning to learn how to pick up the wake word under different background noise.

By installing using microphones and gathering voice data on unmet customer needs, we can then use the information to design improvements in customer experience. Bearing in mind that eavesdropping is illegal, it is a prerequisite therefore that the voice data that is collected must be genuinely anonymous or anonymized and cannot directly or indirectly be linked to an individual. (Note: according to ICO's Guide to GDPR, information which is truly anonymous is not covered by the GDPR.) Because the objective is to understand unmet customer needs, there is no need to link the information to any individual. However, to be compliant with privacy laws around the world, customers must be notified in some way that a voice listening device is present. Hence, despite the potential of voice recognition technology, such a system may not be feasible in an airport setting.

Idea 2: Use a shared inventory query system

Very often when a store does not have inventory for say your shoe size, the staff at the store will use a tablet to search if there is inventory available at a nearby outlet. Or if the item you are asking for is not available, the staff may direct you to a nearby department store where the item may by chance be available. It is a kind act, but there is no guarantee that your walk to the department store will pay off as you may upon arriving there discover that they too do not stock your shoe size. Using another example, you may fail to find the cough drops you need at Boots, not knowing that they are on a store shelf just 50 meters away at the airport boarding gate area. So, what if airport stores can share data of their inventory, such that users can make queries on a store locator? This could benefit both shoppers and retailers. Shoppers will have access to richer information on goods and services they can purchase, and retailers can gain from having a 360 view of airport retail that would help them optimize their supply chain and generate more revenue, the latest Coresight Research report attributes a 4% increase in sales for those retailers using shared sales and inventory data to improve performance. (Source: Measuring the Value of Retail Data Sharing and Analytics (2020) Coresight Research).

Idea 3: Use a modern suggestion box

Suggestion boxes were widely used in the past as a safe and anonymous way to communicate any message that people did not want to pass on in person. Although the physical box is an outdated thing we rarely see today, the idea of collecting feedback and insights from customers and employees is still very valid. Much cheaper and easier than installing voice recognition devices (Idea 1, simply asking travelers to submit their unmet needs (if any to the airport via a comment portal in return for free WiFi or shopping discount coupon, and asking airport staffs to share their knowledge of unmet customer needs, could unveil rich insights that can be used to improve customer experience.

If airports and airlines can share their anonymized voice of customer (VoC) data and insights on customer experience at various airport touch points, we can then have a more holistic picture of the airport experience. With sufficient data, we can understand for example customer satisfaction at peak hours versus off-peak hours, or differences based on demographics and psychographics. It could be that an airport needs more female lavatories at congested hours, or that lounge users will have more peace of mind if the luggage shelves have locks.

2021 New ideas

1. Clairvoyant

A Japanese airline may have rich information on Japanese travelers, and a British airline that of British travelers and so forth, such that by combining VoC, we get closer to knowing the customer experience at an airport at a particular point of time.

Idea 4: Use contextual demand forecasting

Unmet customer needs can also be a result of a demand spike such as when there is a large travel movement at an airport. For example, there may be several charter flights on a weekend to transport tourists to a sport event, and this could produce unexpected high demand in airport shops and restaurants. Or there may be a large Muslim travel movement, which unless detected in advance, would create a sudden huge demand for Halal food at airport restaurants beyond what the restaurants could cater for. In addition to sharing information around passenger throughput based on flight schedule, we can also develop passenger behavior and trend intelligence by data mining and machine learning social media data such as from Facebook, LinkedIn, Instagram and TikTok. (For example, Cirium's Migacore that uses machine learning to pick up contextual signals).

Idea 5: Use airline data

Airlines have rich information that can be shared to improve airport customer experience. Even basic information such as the number of business and leisure travelers on each flight can provide insights on travelers' retail demand at different time of the day. If for instance we know that Gate64 will be used by various low cost carrier airlines departing for holiday destinations, we can then assign retailers to use common retail booths or pop-up booths to sell sandwiches or snacks that passenger can buy before they board their flights. Another example would be knowing the number of business travelers arriving early in the morning who do not have hotel early check-in, arrival lounges and nearby hotels can provide morning use packages such as with breakfast and shower. Arrangements could also be made to have payments made by mileage points, giving the traveler more options and opportunities to burn their miles. In return for sharing data with retailers, airlines can upon agreement with retailers have some form of revenue sharing to align incentives.

Idea 6: Use payment data

Anonymized, aggregated customer payment data exists outside of the airline environment, enabling the various touch points within the airport space to make and execute smarter decisions with better outcomes, to drive business growth and strengthen consumer engagement. Customer behavior has been changing and evolving over the years and the pandemic has accelerated that change. The airport environment only captures customer behavior when they are at the airport. For example, customers today may preference less face-to-face interactions and more digital experiences. If we can understand payment data for customer segments for example based on card-present / card not present and different retailer transactions we can enable informed decisions to the airport environment on how customers would like to be treated in the airport space.

In summary

All the above-described ideas generate data which can be ingested into a digital twin or used to complement information that is available such that a better airport customer journey can be designed or altered with flexibility. Availability of data also means that we can then apply other digital tools to further improve user experience. For example, intelligent agents can be used to search and locate a store that offers the best fit to the passenger's search criteria, and geo-location augmented reality (AR) can be used to give location directions and provide information.
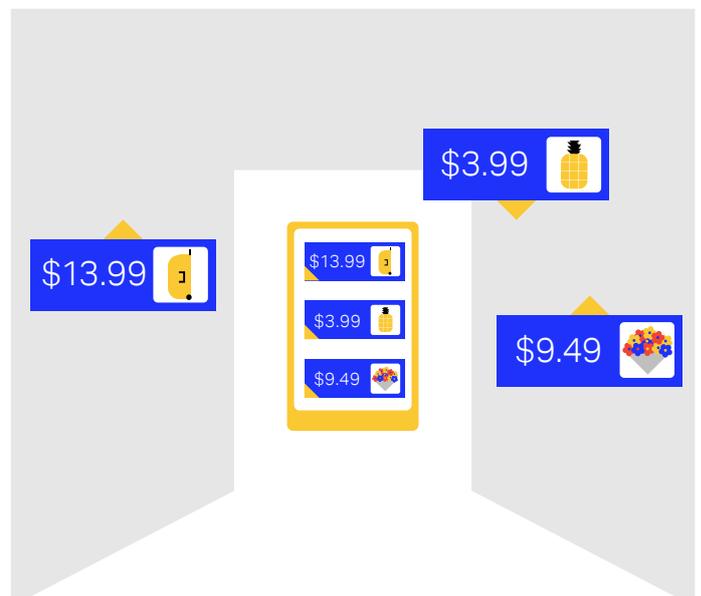
2021 New ideas

1. Clairvoyant

Benefits

With every "no" there is a chance to improve customer experience. In this paper, we have explored several methods to gain that insight with which we can use to improve customer experience at airports. As the airport environment and feasibility of the suggested methods could differ from airport to airport, and even within an airport they could differ from one location to another, a mixed approach of using a combination of methods could be an answer. Any mechanism that can uncover and meet unmet customer needs will have the potential of generating more revenue and will hence provide incentives for service providers to participate in the ecosystem.

| Voice | Inventory | Ideas | Context |

Better experience
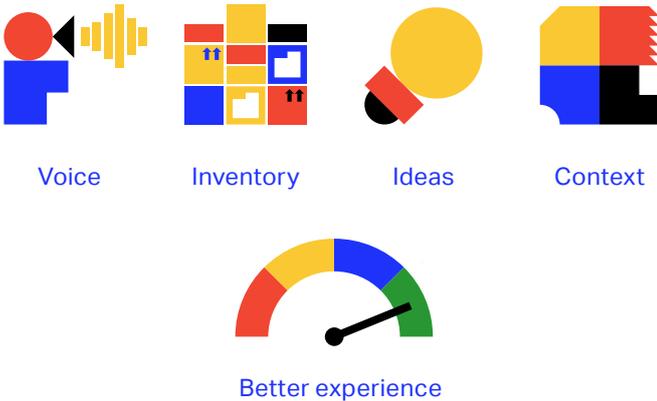
Another benefit would be to allow retail stores to de-cluster and to usher traffic to otherwise less frequented locations in an airport terminal. For example, a premium lounge could be located further away from the shortest route to the boarding gates but compensate that slight inconvenient by providing a more spacious environment and better facilities such as shower and bed.

Airlines too benefit in many ways. A passenger's happy airport experience, being part of his full customer journey, creates positive sentiments that could influence his evaluation of the overall airline experience. A bad airport experience on the other hand could carry negative emotions onboard a flight. Data sharing and collaboration with airport retailers can also generate new revenue streams and reduce operation costs. Take the example of in-flight duty-free sales. Stocking inventory on flights where limited galley space restricts the quantity that can be supplied (hence causing sold-out situations reduces sales opportunities, Unsold inventory also means that the flight has carried weight that did not serve any purpose.

A better way of doing this would be to provide a wide array of duty-free items on the IFE, but instead of stocking items on the aircraft, we have passengers collect them upon arrival before customs clearance. This creates a better demand and supply match, eliminates the crew task of sales cart inventory management, reduces weight and hence fuel consumption, and generates more revenue.

Next steps

A key critical success factor for such a scheme to work is to have stakeholders participate in the ecosystem, and one way of achieving that is to have them see the results first. We do so by creating a digital twin of the airport 360 retail space and use that to visualise and replay a typical day in a past week, month, or year. We then compare that against a projected scenario (or multiple scenarios where data is shared and observe the potential improvements in both retail revenue and customer experience. A trial period could be set up to experiment live operations, where passengers can download a mobile app or use an airport kiosk to locate goods and services they need.

Measuring success

In order to evaluate whether or not we succeed in achieving the objective of this PoC, we plan to use the following KPIs to monitor success.

1. Number of participants within the ecosystem: As a critical success factor, we will need sufficient number of airports, airlines, service providers and retailers to share and ingest data into the digital twin so that we can obtain the information we need to improve airport experience.

2. Number of improvements per time period: Based on the insights that have been derived from the digital twin, we will then plan and implement improvements such as altering services and adding flexibly depending the travelers' needs at different times of the day.

3. Net Promoter (NPS) and Customer Satisfaction Scores (CSAT) scores: We will also monitor improvements in NPS and CSAT scores.

4. Increase in revenue: Where changes (such as the forming of new business partnership between stakeholders) are expected to generate additional revenue, KPIs on revenue will also be set to measure performance.

2021 New ideas

2. Construct-o-matic
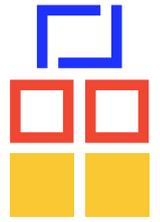
Vision

Deconstruct the travel industry into "lego-style" building blocks of capabilities, to enable more flexibility, remove barriers, and provide a resilient end-to-end experience for the customer.

Vision description

The aim is to enable a decentralized ecosystem where suppliers can participate easily, and that can be accessed by any player with little to no friction. The full journey can be offered by airlines or by third parties (even in other industries: in other words, airlines can be retailers or simply suppliers. Besides, the "assembly" of services by any entity can, in turn, become a service available to others.

The key aspect is the discoverability of these capabilities (e.g., serving food, hosting a meeting, providing a transportation from A to B. Two aspects of this discoverability will be detailed: from a distribution point of view (making services searchable and available and from an inspiration perspective. As an example, a customer can simply request to travel from their home to some destination (or "somewhere sunny in the next 2 weeks for 3 days" or for some event, and all the various services needed to provide this end-to-end experience can be found, matched to the customer's need, and combined. In addition to that, discoverable capabilities can provide a "self-repairing" feature: in case of disruption, the end-to-end journey is automatically adjusted by changing some of its blocks.

NDC is currently missing (at least partially a way to make services discoverable. How could an entity, overseeing the full journey, keep track of new / trending offers (e.g., new routes opened / trips that friends made? This builds on the original NDC concept of the airline profile, with the potential addition of decentralization. In addition to describing the services available, this "supplier profile" could set the rules regarding who can buy and / or assemble these services. The ongoing IATA initiative exploring the Future of Interline is already starting to look at the requirements to define such a product catalogue.

The catalogue of discoverable capabilities may also be exploited to provide innovation in the area of inspirational search. Facilitating this will be essential to deliver an effective future travel ecosystem. Deconstructing how shopping is

done could lead to potential opportunities of alleviating some current problems, for instance high look-to-book ratios: this should be explored too. Along with that it is critical to facilitate that appropriate granular definition of products and to ensure that products from multiple suppliers can be easily sourced & combined for the benefit of the end customer.

Current situation

Today, the travel industry is a fragmented landscape of products and services. While bundles can already be offered, there are few links between the various suppliers, leading to a limited flexibility (especially in case of disruption and significant barriers to entry for new companies or services. NDC is a step to simplify this situation but can be taken even further.

Because the travel industry is a service business, there is additional complexity involved: servicing, both voluntary and involuntary. This explains why the lack of communication between the components of a journey is particularly detrimental to the customer, be it during the shopping phase or in case of disruption. On top of it, there is no mechanism to identify and check who service providers are. In addition to that complexity, there can be combinations of hundreds, or thousands of items / capabilities related to travel, many of them very airline industry-specific (e.g., locations are all represented with airport codes, restricting possible services.

The lack of seamlessness in travel, and the difficult integration of components in the travel ecosystem both lead to extra costs that could potentially be avoided, as outlined in this white paper.
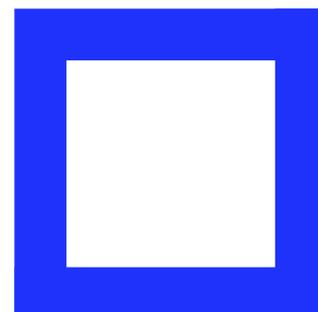
2021 New ideas

2. Construct-o-matic
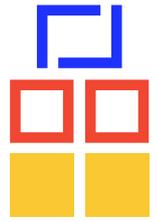
Case for change / recommendations

Concept, roles, and definitions

Discoverability is the degree to which something, especially a piece of content or information, can be found in a search of a file, database, or other information system. In the context of our future travel ecosystem the concept of discoverable capabilities is the degree to which the building blocks of capability that enable future end-to-end travel experiences can be located, connected to, and consumed.

We need to define a standardized mechanism by which the actors in the future travel ecosystem can publish what they have to offer (products and services, how to connect to them, how to interact with them and how to understand the role they can fulfil in an end-to-end customer journey. This primarily related to the distribution aspects of this future world and enabling new suppliers to participate easily in the de-centralised world.

From the customer perspective there is an additional requirement for discoverable capabilities to enable inspiration. Customers want to be able to explore and understand the world of the possible that our future travel eco-system can enable for them. The supplier capabilities need to be discoverable and explorable from not just the functional standpoint but also one of inspiration and aspiration. Where can I go? What can I experience? How can I travel?

There are many roles required to represent the actors in the future travel ecosystem and to define the part they play in providing or utilizing the underlying discoverable capabilities. Along with the end customer, two of the key roles we expect in the new ecosystem are of retailer and supplier. In this paper it is intended that these do really represent roles rather than organizations. It can clearly be demonstrated that an airline, for example, fulfils the roles of both retailer and supplier:

- An airline supplies product that will be sold both by itself, acting as a retailer, and by other retailers.

- As a retailer, an airline will sell not just products it supplies itself but also products sourced from other suppliers.

Customer means a party who purchases products and services from a retailer, either directly or through an agent of that retailer, or who subsequently consumes those products and services.

Products and services mean those items which will be delivered to a customer and consumed as part of their end-to-end travel experience. The level of granularity of products and services may vary by participant in the value chain. It should be possible to represent the potential products and services that a supplier will provide. Within this ecosystem is should be clear that payment itself can be thought of as a product. Suppliers who can offer innovative approaches to payment will be able to participate in the ecosystem and enable their offerings to transform the overall offers made by suppliers and, ultimately, the customer options available when paying for their order.

Retailer means an enterprise that sells products and services directly to customers or through agreed agents. These products and services may be obtained from the supplier and sold to the customer, either individually or as part of a bundle, at a price determined by the retailer.

Supplier means an enterprise that contributes products and services to a retailer and is responsible for the delivery of those products and services. Supplier participation in the ecosystem will be able to have numerous differentiating features – primarily in the products offered but also in the approach to commitment levels. This will define detail of the supplier responsibility when it comes to fulfilling the customer order, what happens when things change and how payment and settlement is managed. The efficient supplier onboarding process required to support this explains more about the ideas of levels of commitment.

These definitions form the basis for the overall scope of discoverable capabilities. In addition to that there are expected to be specialisms of the supplier role. Two of these have been identified so far – although there may be more. A constructor / collaborator is expected to be a specialist supplier who does not have any products and services of their own to offer but instead use other supplier offerings to build into a contiguous experience. An arranger is similar to a constructor / collaborator, but they may have their own products and services to provide and take responsibility for coordinating and managing the end-to-end customer journey. This may not be a separate company but could just be a piece of intelligence deployed in the ecosystem that provides this service. This highlights the opportunities for new entrants to play in the future travel ecosystem and reflects the logical separation of retail and supply. There will be different approaches that can be taken, such as the intelligence, in the retail role.

2021 New ideas

2. Construct-o-matic
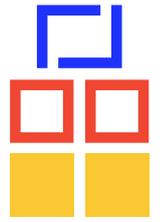
Ecosystem model

This exercise seeks to explore a future travel ecosystem that brings the travel industry and the associated participants to come together to offer a service or a product along the customer's purchase or actual journey. We are imagining an ecosystem where entities on the supply side (suppliers and consumers (customers on the demand side can come together to complete a transaction and get a lot of value from it.

Today's retail marketplaces are becoming more and more about verified commitment-based suppliers or full commitment-based suppliers (explained as part of the supplier onboarding process) becoming part of the suppliers' ecosystem. The proposed future travel ecosystem will use the Event Driven Architecture (EDA – defined by AIR Think Tank 2020) as the decision-making engine to trigger supplier participation or bringing an offering to the traveler during the purchase or during the journey. The traditional request-response API models do not support much of this interconnected communication and hence that's where an event-driven API architecture-based ecosystem would deliver value.

An event-driven architecture establishes an event that can be consumed and reacted to. An event is essentially any significant change from one state to another. Any such state can be reacted to internally, externally or can be used to generate another event.

The future travel ecosystem will enable the enrollment of 3 different sets of suppliers under different supplier categories and the event broker and decision system will trigger a call to the suppliers. Any of the 3 kinds of listed suppliers could be invoked to offer their product or service during a purchase or even during the journey.

The 3 levels of participants that are possible in the future travel ecosystem model are as below:

1. No commitment-based supplier – traveler-rating driven

2. Verified commitment supplier

3. Full commitment supplier
These will be explored in the following section on supplier onboarding.
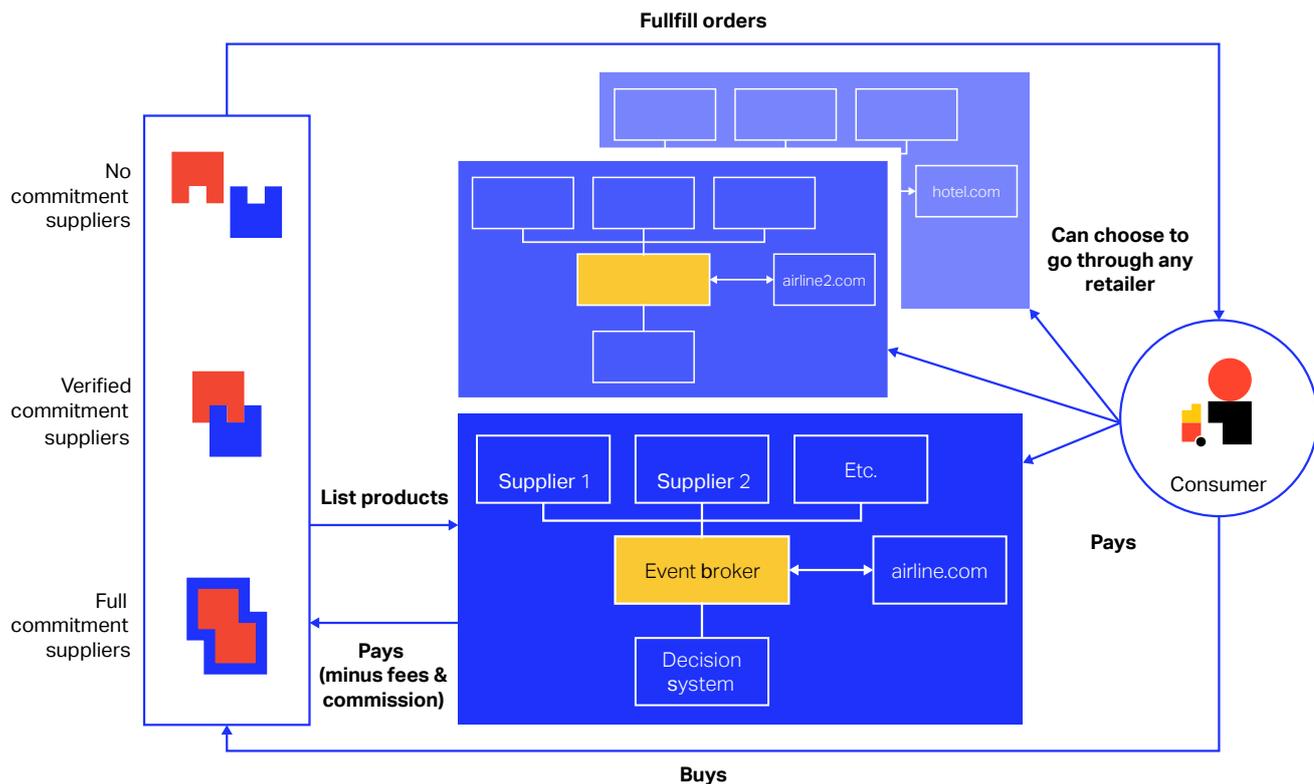
An event-driven architecture promotes the production, detection, consumption of, and reaction to events.

2021 New ideas

2. Construct-o-matic
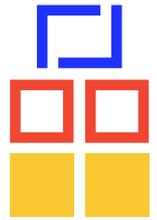
Supplier onboarding process

The success of a discoverable ecosystem relies on the huge number of possibilities, offers, inspiration content, while ensuring a safe booking and delivery of the various travel experiences.

Therefore, our discoverable ecosystem should enable to easily embark very small, independent suppliers to enrich the future possible experiences, while still proposing solid, guaranteed features at least for what is the backbone of a travel and stay experience.

We see in the rest of the current document how demanding the commitment will be for key components of the travel, especially for the suppliers, namely "verified commitment", and "full commitment" suppliers. For these suppliers, there will still be an enrollment / certification process to guarantee servicing and IT capabilities, deposits 100% safe in return of guaranteed booking for limited-inventory experiences (like hotel room, Opera show, boat trip, etc., most probably associated with certified labels for capabilities in IT, settlement, or automated invoicing processes. Enrolling a seller profile – similar in the future to what is the "airline profile" described in NDC standards today – associated with IT and safety and financial quality labeling, should cover such a need. However, this might come at the expense of a certain level of effort and work – and probably also some cost – from the seller.

What will be new is how easy we can instantly enroll micro-experiences. We all know that an unforgettable travel experience includes the interaction with a myriad of small, independent citizens and companies: the knowledgeable individual guide in a remote village of Tanzania, the smart independent chauffeur in Mauritius, the best hot-dog food truck in Manhattan, the well-introduced local English interpreter / guide which will help you for your local business, etc.

All these "no commitment-based suppliers – traveler rating driven", will be able to provide, rich, inspiring content to the ecosystem, and receive bookings and updated info based on event-driven information sharing (NB: no money deposit, all is based on mutual trust).

For this purpose, the ecosystem will provide a robotic interface to enroll these small suppliers and then manage interaction until direct contact between the supplier and the customer is established. For this white paper we would list the following key elements for the enrollment process:

- The enrolment robot is using a very common interface at the time: in 2030 it can be 100% vocal and haptic, must remain affordable, interacting with simple, cheap smartphone capabilities of the time.

- The supplier is asked to provide only the needed information at each step. Only minimal inspiration content is needed to start (a picture, a name, and a contact point). The robot will later ask the seller to provide more details, case by case and only if there is interest from at least one customer.

- Easy content sharing is possible from existing contents in other sources like social networks (who will be the Instagram or TikTok of 2030+?).

- As soon as possible, a reference / link to ratings (star based?) is added. Ideally this would be based on an independent, non-related rating system (like Google comments or TrustPilot in the 2020's).

- The inspirational "rich" content will still probably be mainly pictures and visuals, but also videos, 3D captures, sound or smell or taste samples, or whatever will be eye-catching but also affordable at the time for both the seller to provide and the customer to experience in 2030+.

- Basic data inputs needed like the menu for a food stop, the program of a show, the itinerary of a tour, the price list, will still be shared, as attachment to the rich content.

- The robot will also be the interpreter / assistant to request and confirm a booking. It communicates both ways from seller to customer and vice-versa.

- To keep the system ultra-simple, all other interactions like localization, payment etc. will be executed separately from the ecosystem directly between supplier and customer.
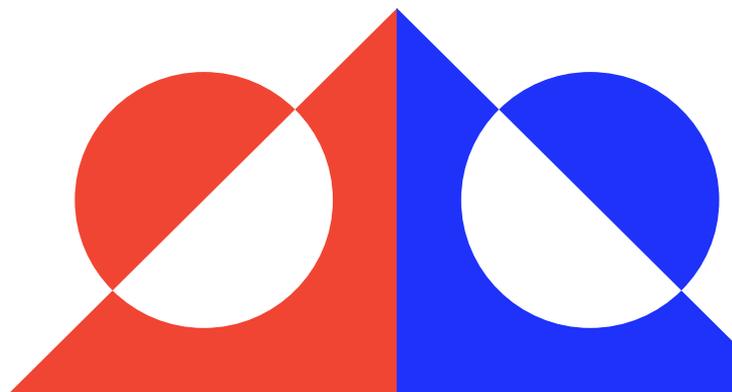
2021 New Ideas

2. Construct-o-matic
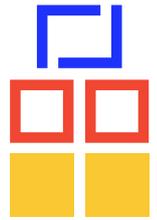
Benefits

Customer journey

To bring some color to the concept of discoverable capabilities, an elucidation on two end-to-end customer journeys will be presented. First, a business trip will be detailed, followed by a journey focused on leisure goals.

Business trip

- An American businesswoman has been invited to present at a congress in Bilbao, Spain.

- While planning her trip, she creates a set of criteria that would match her ideal journey:
  — Arrival the day before the conference.
  — Minimal CO2 impact.
  — A travel itinerary with a minimum number of connections.
  — Etc.

- She places a search on the "Future Travel Ecosystem" and listed her preferences.

- Due to set-up of discoverable capabilities, she easily retrieves multiple itineraries combining air, rail, taxi and hotels, offered by multiple providers in the role of arranger.

- She selects a combination of direct flight to Madrid, train ticket from Madrid to Bilbao and hotel in walking distance – all managed by the hotel fulfilling the role of arranger.

- She can directly pay for the total package via the "future travel ecosystem".

- She receives confirmation from the suppliers that they will ensure a smooth combined journey (including potential disruption cases).

- Her flight to Madrid is delayed meaning that she will miss her connection to her expected train.

- As arranger, her hotel receives this delay event and starts to fix her itinerary. The hotel rebooks her train connection to a later train that she will manage to make.

- The hotel also uses the discoverable capabilities to find a local taxi provider who can pick her up from the station and take her to the hotel. They provide this to her as recompense for the delay and communicate all of this to the customer through her mobile phone.

- When the customer arrives in Madrid, she proceeds to her new train, successfully arrives in Bilbao, is met by the taxi and is delivered safely to her hotel with no fuss and a high customer satisfaction.

Leisure trip

- A French couple would like to spend next week at a sunny coastal region within three hours of traveling.

- They have no preference in form of transport and also not yet a location in mind.

- While selecting the three hours travel time max, they click on the discovery functionality of the "future travel ecosystem".

- Multiple video-based offers show on screen, detailing destination, hotel and modes of transport.

- Inspired by the video stories of the city and facilities, they select a boutique hotel in Genoa.

- Multiple models of transport are offered, but eventually they select a combination of a flight and a self-driving taxi ride to get to their hotel.

- They decide to pay part of their trip by their earned loyalty points.

- During their trip they decide that they want to extend their trip by two days.

- Using the future travel ecosystem functionality, they are able to request that extension, have it picked up and actioned by their hotel and for their transportation to be rebooked as well.

2021 New Ideas

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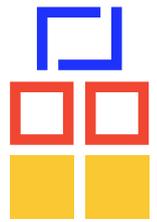
Next steps

To start our journey towards this future world of a decentralized travel ecosystem, we need to begin to create the foundations needed to help it to grow and flourish. An ideal starting point would be to create a small demonstrator of the required capabilities with a few future travel suppliers providing content to the ecosystem and a few future travel retailers discovering and using that content to construct new and interesting journeys.

We need to take the base requirements of airline profile NDC and the soon-to-be defined requirements for the future interline product catalogue and use those as the foundation for new discoverability standards. Using the IATA Open AIR initiative, we should start to define initial versions of the expected APIs and standards and encourage industry-wide testing and trialling to help us evolve to this new future. The technical implementations are yet to be defined but trying to build this will help us learn and make discoverable capabilities a reality.

2021 New ideas
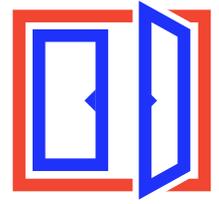
3. Window of the future

Vision

Simplify and enhance the travel shopping experience by moving away from complex shop, price, book, pay, ticket processes, towards a form of retail built around customer's needs, desires, aspirations, and dreams, using all relevant and meaningful intelligence available.

Vision description

Thanks to retail intelligence, airlines in the future will always know better who their users and customers are. They will know their stories based on their many online touch points. The customer experience will be made predictive and offer new opportunities and activities based on previous, current, and potential future activities. This will be possible when airlines understand the demographic of their customers and align their airline brand to the customers' lifestyles across multiple touch points: voice assistant, mobile, social media, or whatever the future interaction places will be. This will allow retailers to offer personalized content to the right customer at the right time at the right price.

This will be equally important when entry points for interaction will no longer be via an airline or agent being asked for a flight to a destination but instead will be built on the needs of customers, and on where the customer is. Retailers' superior knowledge of the customer will allow airlines to push their own branded smart offers. This will also be possible in a future where websites for retail are not run by airlines, where other players have the web (API) connectivity, and where parties other than airlines own the distribution reach and methods. This paper explores the new opportunities from retailing intelligence in general, highlighting what is specific to the airline industry.

Current situation

Airlines have a heavy reliance on filed fare and scheduling content and are not in control of their offers and orders. Systems, based on distribution principles from the 1960s, constrain airlines' ability to differentiate their products and to better compete. This affects airlines' ability to be customer-centric, financially resilient, respond to crises and create value, both for the airline and their customers.

In other retail industries, innovative retail intelligence capabilities have opened new horizons towards various disruptive changes: customer behavior anticipation, micro-segmentation, personalization, smart product recommendation, real-time dynamic pricing, and inventory management. Despite their legacy-based technology, most airlines had already mastered pricing and inventory management for flights and load factors within their current "revenue per seat mile" business logic. However, when they want to go to the next level, current legacy systems limit their ability to play the same customer-centric game, including inventory and dynamic pricing, for other products than tickets for air travel (e.g., ancillaries, third party offerings).

Moreover, the personalized offer is not truly there yet. The entry point is always an enquiry to a destination and proposals based on price and schedule alone. Airline interaction based on a customer's persona leaves little opportunity for personalization. NDC and One Order provides some level of personalization based on "who is asking" but true digital retailing can only be achieved by building up the brand and offering content at all levels of touch points that means something to the customer. There is limited opportunity to upsell and offer content beyond what is being requested in current 'shopping requests.
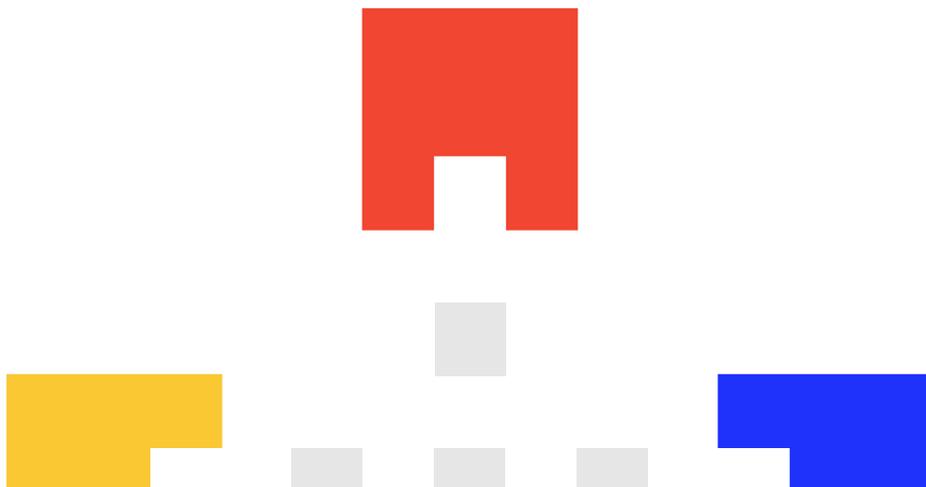
2021 New ideas

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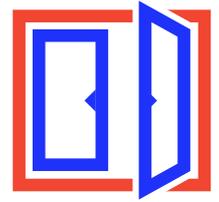
Recommendations

1. Focus on acquiring the customer knowledge and enhancing the shopping experience

NDC and One Order standards will enable the development of ancillary inventory-management and servicing capabilities that will eventually be on a par to what we do with air tickets today. The remaining work that needs to be completed (by airlines, Global Distribution Systems, agents, travel companies, settlement offices and so on) to implement these new benefits of inventory and pricing must not be underestimated. This idea focuses on the specific benefits of retail intelligence for the air travel industry in the domains of customer knowledge and personalization, and enhancements of the shopping experience. Part of these recommendations focus on the need for a collaborative framework since purchasing travel only once or twice a year is not enough for the level of personalisation described in this paper. Thus, we need also to assume a level of reliance on high interaction actors (platforms, search engines, social media) which can be identified as follows:

- Top to bottom: gateways providing profiling information to providers. Personal assistants, search engines, social media platforms can provide all these elements because they have access to all personal aspects of a person's digital persona.

- Network: all actors contributing to an itinerary agree to share their knowledge with each other (for the duration of the retail process) How can we prove that it is mutually beneficial to share data to get data?

- Traveler centric: the traveler having the data and sharing is what is always advocated. However, beyond identity and profiles, when we think about deep derived data created by business intelligence such as what a search engine knows about the customers behaviors this requires that actors should allow the customer to authorize access to the different stakeholders (airlines, travel agents, hotel etc.). How therefore can we convince these big organizations to share these calculated data?

If all contributors rely only on what they know about a customer by themselves alone, then there will be an inconsistent experience for the customer – and this aspect is a prerequisite of what is promised in this discussion. This implies a concept of 'self-declared preferences' where the customer gives permission to access their derived data held on any platform they may use.

If it is assumed that a deeper knowledge of a customer's preferences can be obtained, then it would be possible to employ artificial intelligence driven agents that are capable of shopping on behalf of the customer.

2. The customer owns their digital persona

Both from a regulatory perspective (e.g., GDPR) and to retain customer trust, the full usage of personalized data will be based on an "opt-in" model. It is up to the airline to prove that mastered sharing of data is worth it, to benefit from personalized products and services and accompanying pricing.

The ease for the customer to control and or view their profile, edit, add, and subtract data sources, and to check who can access the data is key. However, these questions are not specific to only airlines, but to all suppliers with whom a customer may be interacting. For purposes of this paper, we assume these critical and emerging privacy requirements will be further refined over time. For example, through regulation and / or business practices that define strict mutual obligations between suppliers and their customers.

3. Use customer data from every source to surprise them

In the future, customer behavior and preferences will continue to leave marks and footprints in many places. For example, a customer's preferences can be found on their device or in an application the customer has signed up to.

Artificial Intelligence is used, as example, to look at past behaviors and suggest new services or offers.

E.g., "The next game played by your team is in Rome, here are some suggestions for flights and stadium tickets".

Thanks to our knowledge, the customer's device knows how to tweak offers from behaviors, activities, spend, likes, interests, and social media profiles amongst others.

Previous behaviors and experiences based on data gathered from past trips can be leveraged to propose some new ideas beyond what they have done before (e.g., "I see you made six trips to Spain but you haven't visited Valencia, some great museums there" or "Manchester United's next big tournament game is in Rome in 4 weeks' time, as you watched them play Barcelona here's a suggestion to see them in Rome").

2021 New ideas

3. Window of the future
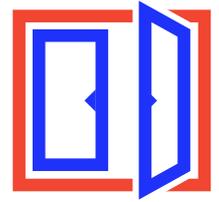
Insights gained from customers sharing their experiences, on community websites could also be used (e.g., "You like fish restaurants, I can recommend one in Rome"' or," I noticed you said the 'Captains Table' was over your budget, try this one which is a little cheaper but still offers great food" or," You seem to like island beach getaways, we have a great deal in Honolulu"). Suggestions could be made on known notable dates (e.g., "I see it's your birthday coming up, here are some suggestions for your friends to come and visit you").

However, these examples of using the retail analytics of today push offers that are close to what customers have already bought, which is not always relevant in the context of discovering new destinations. Retail intelligence and artificial intelligence are expected to push the boundaries and surprise the customer in a pleasant and relevant manner. Responses can also be aspirational, enabling upsell for example. It can help people dream bigger, to be all they can be. It can help predict and suggest opportunities (e.g., helping to meet others, 'Your LinkedIn friend is turning 25, care to visit, I have a fantastic opportunity for you"). Alternatively combine social media profiles to make suggestions based on other people's behaviors in your social networks (e.g., "Care to meet in the lounge? Two of your friends are traveling business class. You can trade up and see them there for $200 USD more?"). The role of influences around a person's network can be leveraged.

4. Personalize customer interaction and guidance

We cannot predict exactly how customers will execute their daily shopping and purchase interactions in the future nor which new "standards" of interactions will have emerged. Will it be based on voice, on haptic screens [1] or 3D holograms? Airlines will have to adopt them quickly. Thanks to Retail Intelligence, the most relevant interface will be proposed for use. For example, customers born in the 2000's will receive a number of options for the various components of their experience (swipe right / swipe left) to include or exclude a specific component. This will also help to build up the Retail Intelligence. Older customers will still perhaps prefer to interact on a tablet or a wider screen with more guidance. Students born in the 2010's will interact with a brand within the virtual environment on which they spend most hours, for example the latest massively used multiplayer video game.

In addition, retail intelligence should also include:

1. The ability to identify why sales were lost. For example, was the sale lost due to or lack of a specific marketing activity. Identify which marketing activities lead into sales?

2. Each customer's journey needs to be customised including the shopping, checkout, and payment journey. Ideally, the store experience should be unforgettable.

3. Retail intelligence should lead to something immediate, i.e. If a customer does something or fails to do something now, intelligence should lead to immediate action ("immediate present"). One cannot wait around for detailed analysis and board room decisions.

4. Additional considerations should focus on the ability to:

    — On arrival, identify where the customer is coming from and how are they finding the website (e.g., advertisements, referrals, web search).

    — Track customer spending behavior (e.g., through loyalty programs).

    — Deliver personalized shopping experiences, at least make it feel personal.

    — Give customer visibility into what they are buying. When shopping online, 'hover above' aircraft type and a picture of the aircraft is displayed, 'hover above' the travel class and gain insight into seat type and leg room and service, 'hover above' the seat and gain a 3D view of the cabin. The same will apply for the destination and other services. The objective being to provide the buyer with as much insight into the operations behind the service as possible similar to being in a restaurant with full visibility into the kitchen.

    — Identify targeted marketing campaigns based on analysis of what works and what does not for specific individuals and customer segments.

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[1] A promising interface for human–computer interaction tools that provides users with nuanced information in a virtual environment. Humans utilize tactile and haptic information to determine object properties using thousands of mechanoreceptors located in the hands.

2021 New ideas

3. Window of the future
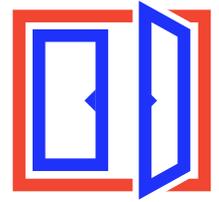
5. Pricing considerations

One core component of retailing intelligence is the price that the consumer sees.

Airline pricing today is already a complex calculus that combines a forecast of passengers expected to fly, the value and willingness-to-pay of those passengers, and the capacity available for those passengers to occupy. That complex calculation makes up the art and science of revenue management. As the industry continues to advance, the ability to deploy artificial intelligence becomes even more important. Using the same tenants as described above, the airline can make even more refined estimates of these passenger forecasts and optimize revenue management by using data that is available in real-time, at the point the passenger is entering the digital retail experience. For example, by understanding the passenger characteristics, like frequent flyer information and historical purchases, the algorithms can better understand the passenger's expectations, measure supply and demand economics and create a win-win for the airline and its customers. On top of this level of personalization, there are also real-time data elements that help the airline adjust the price for individual passengers. This could be based on scenarios like special events and weather.

These same concepts can be applied to the dynamic pricing of ancillaries. Within the digital retail experience, the airline can display what ancillaries are shown, the order they are shown, and the price offered. Each of these opportunities allow the airline to balance the objective to sell more ancillaries, but in the construct of the overall revenue management decision. The algorithms can understand the individual passenger and optimize the price based on personalized and real-time data. The algorithm can also understand the patterns within the purchases of ancillaries to know how to adjust the offering for different departure dates or days of week.

Each of these illustrates the power of pricing in the Retailing Intelligence space. With so many components to the retail experience, one of the ultimate deciding factors for a passenger choosing the airline's offer is the price. Given how important the price is, it is necessary to ensure that the offered price meets both the customer's and the airline's objectives.

6. Seek frictionless payment as it will remain a key driver for conversion

Multiple components will build the travel experience. There should be a single payment transaction for the customer with individual settlement of funds to each provider of a service. Payment options will be made noticeably clearer, including through the "integrated indirect accounts" the customer owns (e.g., an 'Apple' account). For example, thanks to retail intelligence, payment options based on customer's monthly paycheck cycle can be offered. Services are sold to be fulfilled in various countries, with various currencies, various banking systems and regulations and various levels of maturity for money transfers. One specific competitive advantage an airline can have against other retailers is to enable the customer to always be able to use their form of payment all along the travel touch points. Airlines will have to find the right balance between accepting more forms of payment at booking to maximize conversion vs. being able to accept customer payment at each touch point (e.g., buying an extra bag in a different country). In this regard, retail intelligence will help to select the most accepted form of payment among those of the customer.

7. Thanks to retail intelligence, airline offers will feel more customer-friendly, less commoditizing

Retailers which are not specialists in travel will always look to simplify and commoditize the offers of airlines. Their added value is to broaden their inventory of products, in an automated way, at the expense of details and personalization. Thanks to the ability to personalize offers, airlines can push offers which possess the small relevant extras that retain customer attention and thereby helps to ensure conversion. As example, a picture the customer has liked from a specific place as an "eye catcher," or a nice rich-media reminder of a previous trip. This added-value approach will push retailers to accept airline brands to be more present "as is" into their displays rather than generalized and anonymized into the 'store front look and feel.'

2021 New ideas

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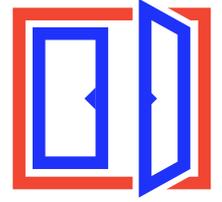
Solution / Benefits

User / Customer:

- Full and transparent control of their data and ability to share data with trustworthy companies (airlines have an aura of safety and seriousness).

- Relevant, curated suggestions for shopping and travel.

- Simple payment with a familiar form of payment accepted all along the travel journey.

- Pleasant shopping experience with various, relevant keys for entry: destination or date is just one among many others.

- Competitive pricing and discounts for known customers.

- Seamless, cohesive end to end experience delivery of consistent content and payment opportunities.

Retailer:

- Personalized offers with higher conversion ratios thanks to eye-catching content.

- Higher conversion rate thanks to smart personalized prices.

- Ability to merchandise their own products within bundles of airline products that makes sense for the customer ('end of the aisle' retail concept (i.e., anything you can bundle together, across a theme, visually, content, price attractive and synchronous).

Airlines:

- The ability to fully leverage their strong brand content on any retail platform they do not own (e.g., their own branded store within a retail platform or web space).

- Airlines have their own personal shopping space in a web mall.

- Will establish a higher level of trust with their customers.

- Airlines can merchandise their own products within bundles of other products that makes sense for the customer (airlines are true retailers).

- Each touchpoint can become an opportunity to assist or sell to a customer beyond just the air booking flow.
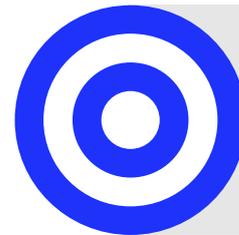
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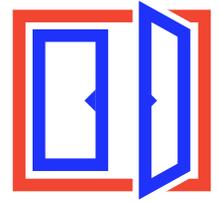
Next steps

Retail Intelligence techniques are gaining momentum in many domains outside of the travel industry. On the one hand, some steps are common to all retailers and will have to be supported by airlines and the air travel ecosystem as well:

1. Clarify data ownership and how to ensure the customer remains a happy owner of their personal data that is used.

2. Build the retail intelligence and artificial intelligence capabilities. This, it should be acknowledged is not an easy task especially when looking at the skill sets required. Many other industries have deep pockets and are struggling to recruit and retain scarce data science talents.

3. Foster air transport legacy technology players to become retail-intelligence compatible. System providers will continue to influence the technology landscape.

4. Define how to implement and control retail intelligence automation. Today very few retailers really master the whole chain of data sourcing and data cleaning.

On the other hand, while these may be considered as generic capabilities for any retail intelligence platform there are additional considerations specific for airlines:

5. Airlines have a tremendous advantage vs. "mundane" online shops because, as service providers, they have multiple touchpoints and occasions for direct interaction with the customer. However, consequently, the direct relationship with the customer is spread between airlines, agents, travel management companies, airport handlers, loyalty programs, banks and so on. Airlines will have to clarify their domain of action, and how to share customer journey (and relevant data) with the other players (pursuant to customer consent).

6. Contrary to some other domains, the airline elements of interaction are quick and inexpensive: Machine Learning processes should be possible at reasonable cost, and with a high level of automation compared to other domains such as medical diagnostic, space exploration or weapon testing for example. This should encourage airlines to use Artificial Intelligence in retail processes as soon as possible.

7. Disruption is part of our daily business: use of our customer knowledge thanks to retail, to process with relevant and smart disruption handling (meaning detect, repair, notify, apologize, compensate). Beyond sales, it is a main use case with high potential to increase customer satisfaction and repurchase behavior.

8. Define how to deal with "anonymous" customers. All our knowledge-based strategy apply when we know who is online.
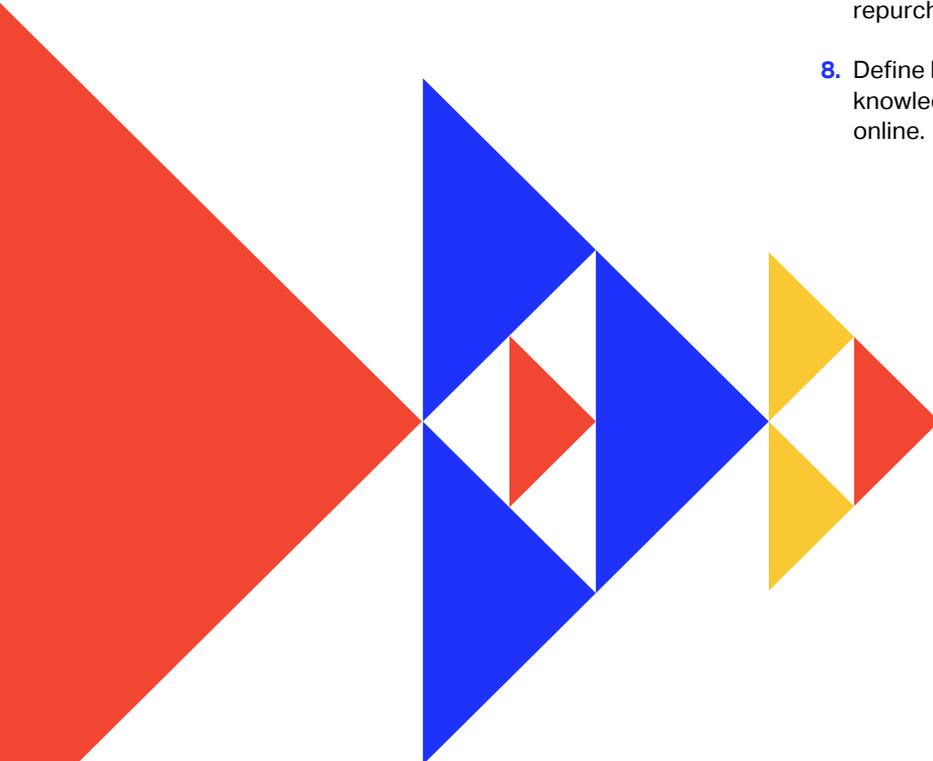
Conclusion

The IATA AIR Think Tank continues to brainstorm ideas on the retailing and how to move the industry forward. The team is committed to driving the industry forward in this area and year after year – despite major setbacks like the pandemic – the AIR Think Tank has delivered. It is truly a testimony to the dedicated members of this think tank team and the industry itself to remain resilient and continue to focus on innovation and improving.

This White Paper will be shared and distributed to the industry in the aim to spark discussion and challenge areas elaborated in the document.

In 2022, the IATA think tank will evolve beyond the current scope of the AIR think tank. Although retailing and distribution will still be a major part of the think tank, it will no longer be the sole focus.

Stay tuned for 2022!
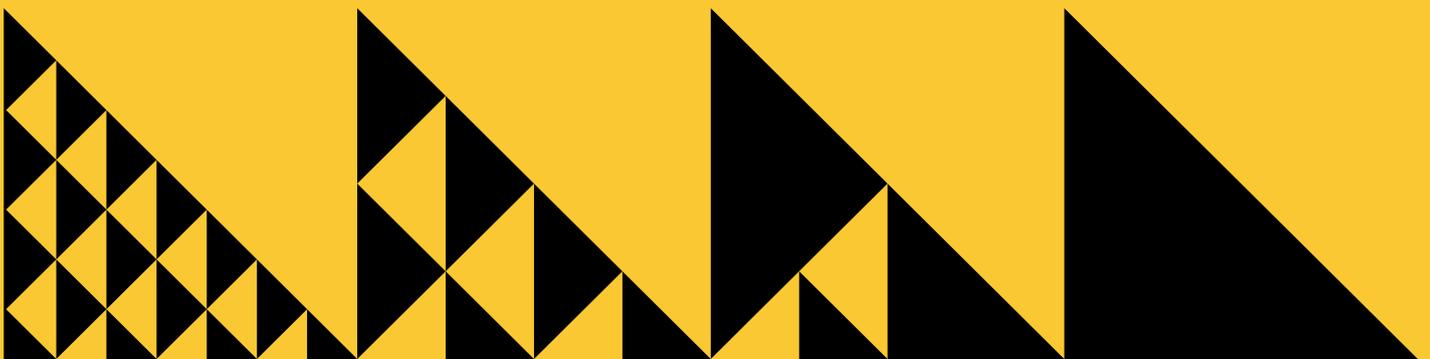
Partnering for success

A special thank you to the 2021 AIR Think Tank members for your contributions and dedication.

Airlines

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