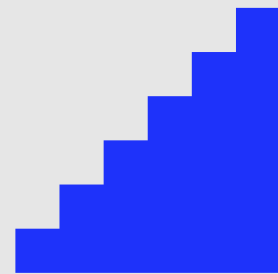
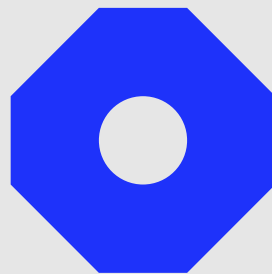
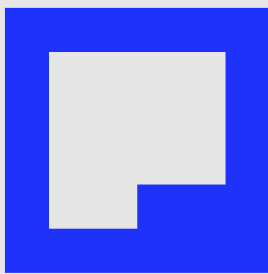


March 2019

Addressing NDC scalability challenges in the leisure market



Introduction

Implementation of NDC-based solutions is gaining momentum. The industry is now focusing on growing toward a critical mass of transactions. The group of NDC Leaderboard airlines have agreed to target making 20% or more of their indirect bookings to be processed using solutions based on the NDC standard, by the end of 2020.

Since the inception of the NDC standard, the industry has questioned the ability of all the players - airlines, airline IT vendors, aggregators, Meta Search Engines (MSEs) and Online Travel Agents (OTAs) - to handle the high volumes of transaction queries for leisure traffic and the impact this could have on the customer experience. Feedback so far has been that "look-to-book" ratios are constantly rising, requiring enhanced computing capacities, and which could result in unacceptable costs and response times.

As a result, IATA commissioned a study to assess the industry's readiness to address these challenges both from a technical and economic perspective. This study was performed by Jean Philippe Mesure, independent consultant from ITS4T, who conducted more than 25 interviews with leading industry actors. The aim was to provide observations in the following areas:

- Current and future look-to-book ratios
- The key challenges faced by the industry to scale up the capability of NDC channels
- What may help to contain very high look-to-book ratios in an NDC environment
- What techniques could make NDC distribution more efficient for the leisure travel segment, so the consumer can benefit from an improved value proposition.

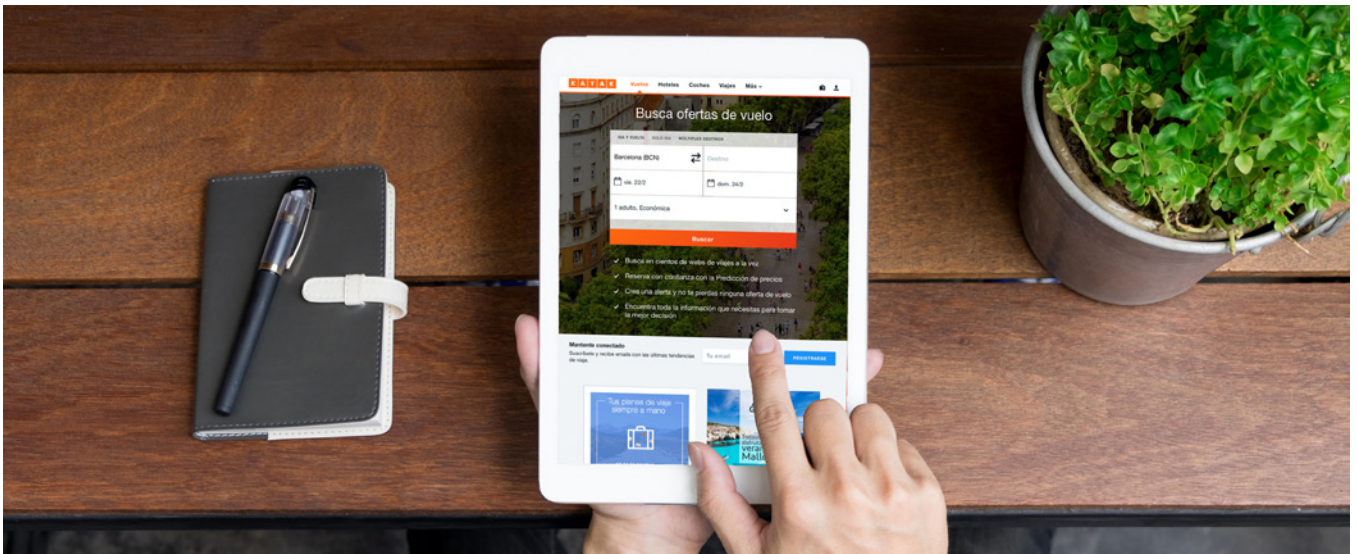
As a conclusion, this report shares possible actions expressed by interviewees that could help deliver the customer benefits of NDC-based channels, in an environment of high volumes, while mitigating the potential technical and commercial challenges.

As always, IATA welcomes industry feedback and looks forward to further discussions with the main players.

Best regards,



Olivier Hours
Head, Industry Distribution Programs Adoption



Look-to-book ratios: where are we today?

We are still at the beginning of the learning curve. Most airlines only started using NDC-based distribution solutions in 2018, either direct to Online Travel Agent (OTAs) and Metasearch Engines (MSEs) or via Aggregators. Out of the 7 airlines interviewed, only 2 have experience with a meaningful volume of bookings. However, by the end of 2019 all airlines interviewed said they would have an active NDC-based distribution channel available. The GDSs and some aggregators have implemented live connections to a limited set of airlines' NDC-based channels. Taking advantage of the momentum NDC has gained, more aggregators plan to launch NDC-based services in 2019.

Most of the actors interviewed believe that the Leaderboard target (20% of indirect sales powered by an NDC API by end of 2020) is realistic and achievable.

Current distribution trends show that look-to-book ratios in the leisure segment (through OTAs or MSEs) are extremely high. Far from the 100- to 300-to-1 observed with airlines' own websites, the look-to-book ratios for OTAs or MSEs are in the best case 1,000-to-1 but more commonly above 10,000-to-1. Look-to-book ratios vary by country, the type of itineraries distributed and the experience of the NDC players involved.

A consensus seemed to appear amongst the interviewees that an average look-to-book ratio in the range of 5,000- to 10,000-to-1 should be achievable with experience and adequate monitoring and containment measures. It seems that 1,000 to 1 is achievable for simple domestic itineraries.

All players acknowledge that keeping the look-to-book ratio down requires continuous attention and actions. Look-to-book ratios tend to be multiplied by a factor of 3 to 5 when

the airline enables MSEs to poll its Offer Management solution from the initial search. So, can the technology cope at a large scale with such look-to-book ratios and can this be made economically viable for the travel distribution value chain?

What are the challenges resulting from high look-to-book ratios?

The main challenges identified by the interviewees are around cost, scalability of the IT infrastructure and response time for NDC-enabled solutions.

a. **Cost**

This is by far the most significant challenge. All players across the value chain are impacted to some degree by the costs resulting from high look-to-book ratios. While this is the case with traditional distribution based on fare classes availability, the costs fall differently with NDC based solutions.

Airlines potentially bear the most risk here, as they need to provide responses to a significant number of shopping queries.

This risk is manageable if costs remain in line with the opportunities created by technology improvements.

b. **Scalability of IT solutions**

The very large majority of industry players are comfortable with the scalability potential of their IT solutions, even at a high volume of transactions. The IT solutions that support NDC-based distribution solutions are for the most part already implemented in the Cloud. Currently, only a few of the providers of such solutions have experience in processing transactions with very high throughput, so scalability for many solutions is yet to be tested.

c. Response times

The Offer/Shopping transactions response time can be longer (particularly when interline content is processed) than other PSS/GDS transactions, due the amount of data processing it involves.

This may become an issue for GDSs, aggregators, OTAs and MSEs, as the time to produce an offer to a traveler or travel agent would be driven by the slowest responding airline. It is up to each airline to negotiate with their IT providers for SLAs on the shopping transaction response time to enable it to perform its business.

To mitigate these challenges, some players have implemented or intend to implement solutions to manage the volume of shopping transactions, to reduce the volume of data exchanged during the shopping/booking process and to keep the overall cost of ownership per booking in the NDC channel acceptable. We will discuss these solutions in the next two sections.

What can be done to manage the look-to-book ratios?

To manage the look-to-book ratios, different players across the value chain need to work together to ensure that customers are not misled or burdened with unreasonable offers. A typical example is a 10-hour overlay for a short haul trip while the customer intends to do a one- or two-day return trip. Computing relevant offers is more demanding than simply requesting availability through EDIFACT messages and therefore should be processed when relevant.

The following strategies either have been successfully implemented by some industry players or are seen as helpful in managing shopping transactions, the payload of data transferred and the response time.

a. Providing relevant and consistent information to the traveler at the right time

Swamping aggregators/OTAs/MSEs with hundreds of offers which include very long elapsed or connecting times, unlikely itineraries, etc. is unproductive.

Similarly, presenting add-ons while the traveler still is in his/her inspiration phase of the shopping process creates confusion and slows down their decision-making. Understanding where travelers are in their travel planning process is key. Airlines should follow retailing techniques from other industries where add-ons are not necessarily presented at the start of the process (hotels, cars etc).

Travelers tend to search for the same content using many sources (MSEs, OTAs etc.). Airlines should

give them the confidence that they are receiving the relevant offers through all channels, so that travelers no longer feel the need to search through multiple channels.

These methods are being successfully tested by some of the industry players that participated in the study. These efforts to date are certainly not exhaustive, and require monitoring and fine-tuning.

Some industry players believe that the wider use of voice-based search may change traveler behavior.

b. Working with OTAs/MSEs to optimize the look-to-book

To be competitive, OTAs and MSEs must present to the traveler the best offers at the best prices. In order to do so, they tend to generate many offer queries splitting itineraries and making requests from several different points of sale, etc. A constant dialog between airlines and OTAs/MSEs can help avoid unnecessary shopping requests (for example, advise OTAs that the airline's Offer management is agnostic to the point of sale).

c. Filtering out robots and limiting the deployment of result-based caches

Robots are believed to generate a significant number of current shopping transaction requests. These may be effectively filtered out by specialized software solutions. However, some of these robots do add value (competitive watch for example).

Third party travel solution-based caches tend to contradict the premise that NDC will provide personalized offers. They are implemented by players at various levels of the distribution value chain. Indeed, caches tend to generate unproductive shopping transactions just to get refreshed. In contrast, airlines could provide solution-based caches which would reduce the average cost of a shopping transaction.

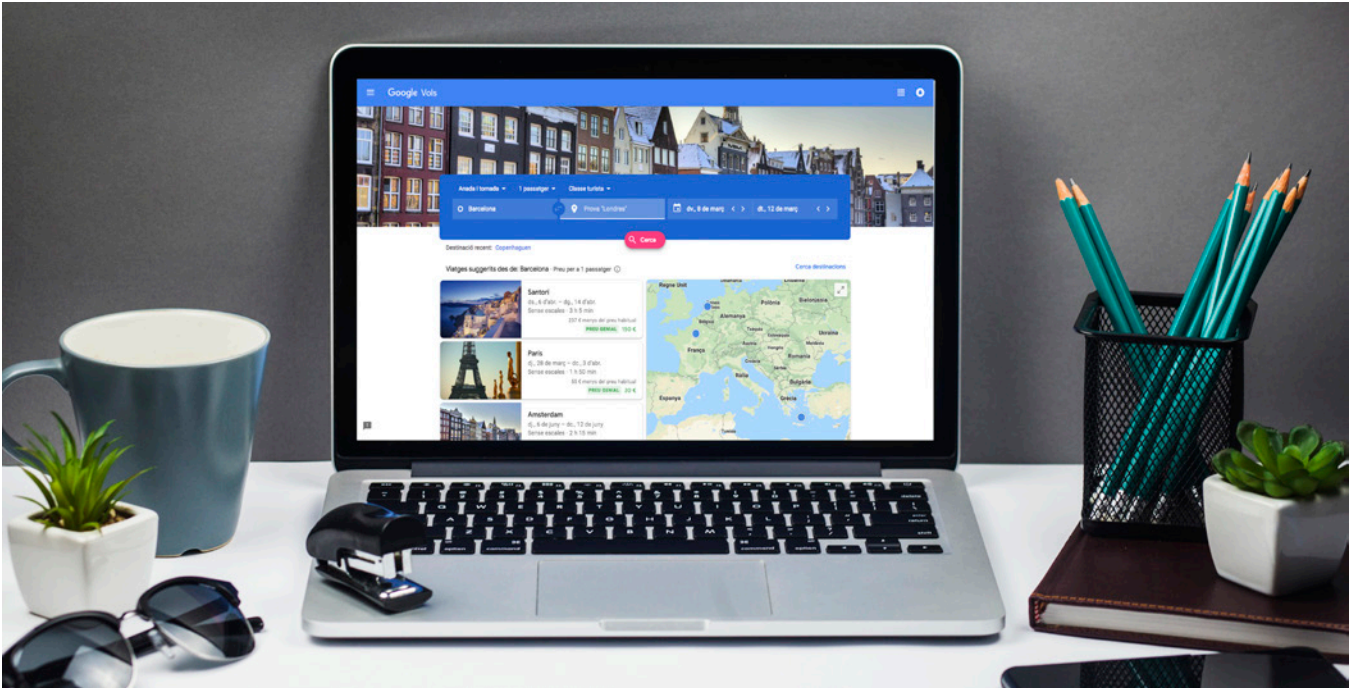
d. Implementing Airline Profiles

The Airline Profile is a repository logic for airlines to indicate the origin – destinations they are willing to provide an offer for. It should enable GDS/aggregators, OTAs and MSEs to know where to send which Shopping requests.

All industry players interviewed supports this initiative. However, while it is conceptually quite attractive to limit the look-to-book ratio, its practical implementation and its adoption by a critical mass of industry players are not expected in the short term.

How to deliver a cost-effective solution?

Despite the mechanisms that could be implemented to manage the look-to-book ratio, it is widely expected that the ratio will remain in the several thousands to 1. Therefore, the industry must find ways to make the shopping process as



cost effective as possible for the various players across the value chain (including the airlines).

There is an expectation among some of the participants in the survey that, as the industry moves from the filed fares pricing structures to more dynamic pricing, the cost of processing offer/shopping transactions should decrease. However, because dynamic pricing may lead to an increase in offer requests, there could be an effect on the look-to-book ratio. This will be an area to watch.

Through the interviews that were conducted for this study, the following three main options were identified as having the potential to assist in managing the costs of shopping transactions through an NDC-based solution:

a. Result-based Caching

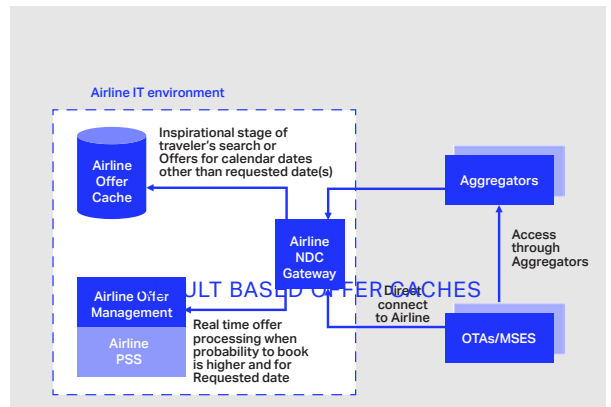
A regularly refreshed cache could store the response to shopping requests for the most frequently requested itineraries and traveler segments. Subsequent similar requests can then be answered without having to re-compute the offer response, saving IT costs and improving the response time. The offers stored in a "result-based cache" could be refreshed frequently to ensure their relevance.

To limit the number of offer requests made to populate and update result-based caches it is recommended that such caches be implemented:

- At the airline level only
- In a push model with pre-computed offers, while also providing live offers as a complement

An airline's NDC-based solution gateway could determine if the request should be routed to one of

its caches or to its Offer Management System, using Artificial Intelligence (AI) to identify the customer type and his or her location in the search funnel. For example, a request for travel taking place in 9 months and with no fixed date could be identified as inspirational, and be routed to the cache.

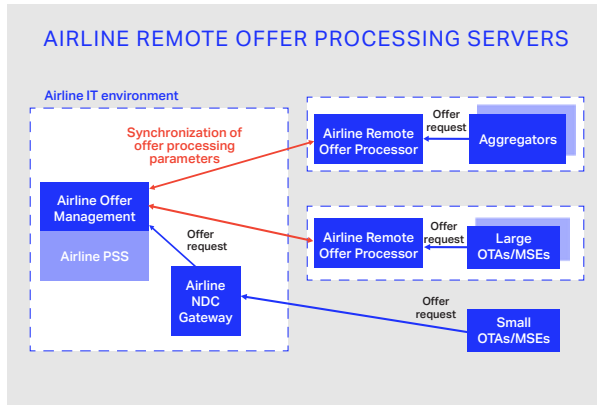


Such caching techniques however, can only help manage costs when the volumes of shopping requests are significant enough to warrant incurring the fixed cost of creating/populating/refreshing the cache

b. Distributed Offer/Shopping servers

Distributed offer/shopping processing servers replicating the airline's Offer/Shopping server can be implemented in the cloud close to where results to offer/shopping transactions are consumed (OTAs, MSEs, GDSs and aggregators). Such distributed Offer/Shopping servers would use the same logic as the airline's Offer/Shopping processing server, and would be kept synchronized, exchanging the offer calculation parameters. Such distributed Offer/Shopping Servers operated in

the Cloud are (or will soon) be available from the main airline IT providers. They provide an interesting way to manage the potentially high number of shopping queries.



c. Cost effective solutions

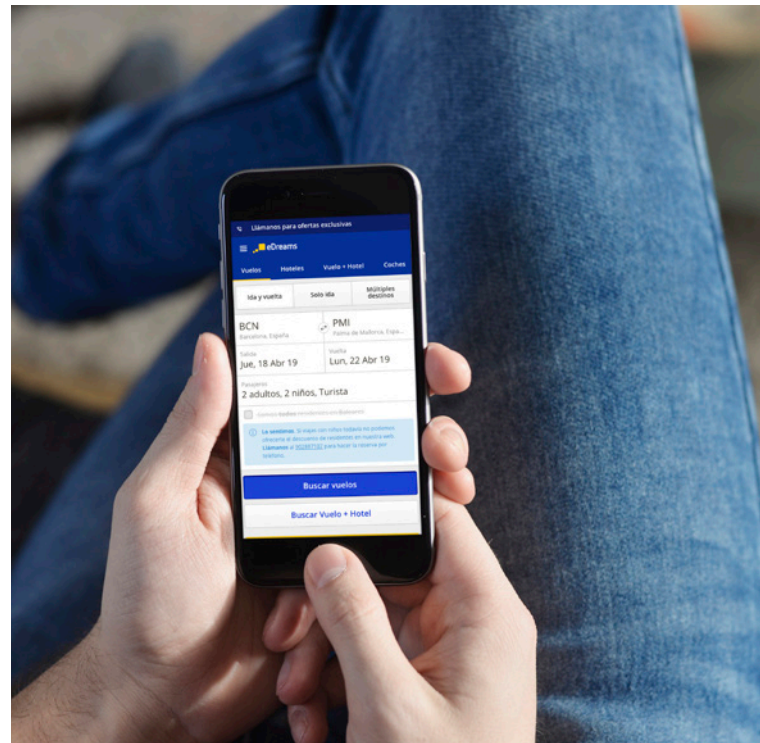
Several IT providers already propose, for their offer/shopping transaction solution, to split the cost per booking (or per passenger boarded) and the cost to respond to volumes of queries, the latter being closely aligned with actual costs to process a relevant number of transactions. This transparent pricing approach, which is made easily implementable when the offer/shopping solution is operated in the Cloud, is one potential approach. There are many other solutions that can be discussed between airlines and their IT providers.

Way forward

As NDC-based distribution solutions scale up, the number of shopping transactions will remain high in the leisure segment. The industry therefore must find ways to manage high volumes of offer/shopping transactions in a manner that is commercially viable. To make this possible, here is a set of best practices we have gathered through this study for each type of actor involved in NDC-based distribution value chains:

Airlines

- Implement the Airline Profile and a traffic filtering solution
- Respond to offer requests with solutions that are reasonable and relevant for the traveler (reasonable elapsed time, reasonable connecting time...)
- Implement retailing techniques to route shopping request to the Offer Management or to the cache
- Implement API management to monitor shopping volumes per seller
- As NDC-based distribution volumes pick up, implement a result-based cache for shopping transactions for travelers in the inspirational phase
- Implement Distributed Offer/Shopping servers



IT Providers & Aggregators

- Build highly scalable Shopping/Offer, Distributed Offer/ Shopping solutions for Airlines

Aggregators

- Study Airline Profile
- Implement retailing techniques to route shopping request to the offer management, distributed offer/shopping processing servers or to the cache
- Present to the travel agent only those solutions that are reasonable and relevant for the traveler (reasonable elapsed time, reasonable connecting time...)

OTAs and MSEs

- Implement the Airline Profile
- Monitor your look-to-book ratio with your airline partners and try to maximize efficiency.
- Present to the traveler only those solutions that are reasonable and relevant (reasonable elapsed time, reasonable connecting time...)

ITS4T focuses on advising Airlines with their IT and Distribution services sourcing strategy and supporting them in the execution of their strategy. ITS4T has been providing consultancy in the last two years to large Air line Groups as well as to smaller Airlines, primarily with regards to their Passenger Services / e-commerce solutions as well as with their NDC strategy. ITS4T also performs studies for industry bodies such as IATA.