NDC
Change Readiness Guide
For Airlines
Edition 3

International Air Transport Association
Financial and Distribution Services,
FDS Transformation

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DISCLAIMER NOTICE

The information contained in this document is subject to regular review in the light of changing business needs of the industry, government requirements and regulations. The views expressed in this guide are based on the views and opinions of the IATA NDC team.
IATA takes no responsibility for the completeness of this document or the various checklists. The airline is responsible for all decisions made based on this document.

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Foreword

New Distribution Capability (NDC) is a key transformation project to modernize airline distribution. It started with the foundation standard approved in October 2012 by IATA, the US DOT approval in August 2014 and with IATA delivering the first set of official standards on 1 September 2015.

The NDC standard will allow an airline to make sales offers to travel agents without them being prepared by intermediaries and this will also permit airlines to both define and price their products in any way they wish. For customers, NDC will offer greater transparency and choice when shopping for travel as it will address the growing gap between the rich content and additional products available on airline websites and more commoditized travel options available through travel agents.

The first version of this Change Readiness Guide was published in October 2015 and received very positive feedback from airlines. It was initially targeted at small and medium sized airlines, but it has proven to be useful to all airline types, whatever their shape or size. A year later, based on feedback from readers, as well as the learnings from pilots and early adopters, we are publishing this third version which provides a more complete coverage of

the full end to end process, i.e. covering shopping (Offer Management) to booking, payment and ticketing (Order Management) , as well as payment settlement and remittance. We have also added first insights into One Order, another key project to modernize airline distribution.

The content of this guide describes how an airline can exploit the full benefit from the NDC standard. The offer is created by the airline host, allowing airline distribution (direct and indirect) to have a unique source of content. The approach for implementation is modular, exactly fitting the airline strategy. New roles appear, with changes to existing ones (GDSs) with opportunities for new entrants. Going beyond distribution opportunities, NDC can be seen as a major Transformation project. Innovative moves for offer creation are now possible: personalization, dynamic pricing. So are innovations for payment. Process flow changes for revenue accounting (with a brand new relationship with BSP) promise new positive developments. The purpose of this document is to give a high level understanding of what NDC is and how to get started. We hope you enjoy the reading and welcome your feedback and comments.

Yanik Hoyles
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1. Presenting NDC

1.1. What is this document about?

1.1.1. Objective of the document

This "Change Readiness Guide" aims to support airlines in planning their NDC enablement. From defining the vision and strategy to initiating the program.
It serves as a guideline to support key stakeholders as well as the NDC Program Manager within the airline. The goal is to reduce the amount of time required for the Program Manager to gather all information, engage and involve all relevant departments within the airline and prepare all the material required to successfully initiate the program.
The information and guidance provided within this manual will help facilitate the various discussions and identify the key steps required for a successful deployment program.
This manual is regularly updated with the latest information and best practices learned during the course of the various ongoing NDC deployments.

1.1.2. General structure

This handbook consists of two main sections:
The first section presents NDC from a general point of view, with its main principles.
The second section provides guidance on the internal organization of an airline's NDC program, and highlights the key questions and checks to address in order to start an NDC project.
The document will, in some cases, refer to examples from the 'real world' of past NDC implementations or from the NDC Pilots program.

1.1.3. How to use this handbook

This handbook is not mandating any specific way to implement the NDC standards. It merely serves as a support tool to the NDC Program Manager to help guide the way. With the help of this Change Readiness Guide, IATA aims to support the successful initiation of the airline's NDC program.
Depending on the airline maturity, its use may vary, as the general presentation of the NDC basics might already be known. In this case, this first part can be skipped and used as a reference during the course of the NDC implementation project.
This guide should be used by the airline with care and diligence, and always in light of their own situation and environment, and in accordance with any regulatory requirements that they need to take into consideration.

1.2. Industry context

NDC started in a rapidly changing industry context, as an answer to three main trends in the airline industry, and as a way to align channels and provide transparent distribution.

1.2.1. Consumer expectations

Consumers are more and more demanding, and this concerns also the way they shop, book and pay:
They want to be inspired by a rich retailing experience: through product descriptions, rich content, and customer targeting, NDC-enabled retailing can help inspire passengers by making them aware of relevant airline products and offers. NDC-enabled retailing resonates with passengers.
To support the technical implementation of NDC, IATA produced an NDC Implementation guide. See reference in Appendix.

They want speed and accuracy: travel websites have to answer within seconds, and when shown, an offer has to be available.

They want transparency: they want to know the 'all inclusive' price - no last minute hidden fees (booking fees, card fees etc.) that appear at the end of the process.

They want personalized offers: business and leisure passengers alike feel comfortable sharing their personal information with them, provided the data is kept safe and they receive relevant offers in return.

They want choice when it comes to forms or payment, i.e. be able to use their preferred method in any channel and/or any country

Overall, customers are ready to share personal details in order to get enhanced offers.

1.2.2. Airline distribution capabilities

- Airlines have heavily invested in IT, and are getting ready to better manage their own offer and its distribution:
- The capability of airline websites is improving, aiming to match standards of other retail industries, proposing both airline (seats, baggage, meals, lounge…) and third party ancillaries (hotels, cars, local entertainment…).
- PSS – Passenger Service Systems (inventory, reservation, departure control systems …), that were built by airlines in-house in the 70's, have been replaced by systems provided by 3rd party IT providers.
- The consumer is better understood as CRMs tools are spreading, with analytical capabilities around Big Data showing promising features for personalization or tailor-made solutions.

1.2.3. Travel agency landscape

Travel agencies use a diverse mix of channels to book clients' flights. Airlines have evolved what they sell, how they sell it and agents have adjusted. The travel agency community is also evolving to adapt to new consumer's needs, and thanks to opportunities brought by modern technologies:

- OTAs and metasearch have grown by focusing on user experience and by being able to process a much larger number of offers (airlines, flights, dates etc.) and data (travel solutions)
- TMCs are evolving their model, moving to more servicing (duty of care etc.) and partnering with online booking tools and mobile solution providers
- Other players (brick and mortar, consolidators, VFRs etc.) build their strength by differentiating their offer through a niche and value added approach.

Travel agents are confronted with an increasing complexity in sourcing content (from car rentals, hotels, airlines legacy carriers, low cost carriers) and have a growing need for intermediaries that fully aggregate content. Next to this, they need enhanced desktops that can display all the content in one place. They view the booking channel fragmentation as counterproductive; and as NDC-enabled processes are brought to market, NDC providers, which include airlines, GDSs, mid- and back-office software firms, and other travel technology firms, must create ways to present airline products and enable booking via both GDS native displays and through agency desktop applications, which use graphically rich user interfaces.

Corporate Buyers have several objectives:

- Traveler satisfaction: they need to be able to book in a convenient way and on multi devices, anywhere, anytime; they also need to understand what they are entitled to get (for example, in terms of ancillaries).
- Be able to control: they want to ensure that the corporate travel policy is clear and applied in the different systems.

Security and duty of care are also critical elements for the buyer.

Tools will help to service the sale of ancillary and personalized products either through Self Booking Tools or via the TMC. Also, the implementation of ancillary sales products and personalization capability means that travel programs can benefit from capturing more data and from targeting travelers with services relevant to them.

Essentially a lot of investment is beginning to occur in the fight to improve the booking experience and this is good news both for the value chain and the customer.

1.2.4. Some limitations in today's landscape

NDC is in effect the modernization of 40-year-old data exchange standards for ticket distribution developed before the Internet was invented.

IATA was created 71 years ago to set industry standards that facilitate safe and efficient air travel (e.g. e-ticketing, bar coded boarding passes, common use airport kiosks, etc.).

In the case of NDC, IATA's role will be to deliver the standards that enable such capabilities for our industry partners in order to offer the passenger the opportunity to have a consistent shopping experience, wherever they shop for travel. The approach consists of using XML (Internet) language to support the delivery of rich content in travel agency and other third party systems, such as the ability to buy additional products and services and to be recognized and receive personalized offers, or shop anonymously, as they choose.

GDSs are already working towards making it possible for airlines to merchandize their products via travel agents in a manner more consistent with airlines' own websites. IATA welcomes these developments. However, each GDS has been working on its own proprietary solution. In contrast, NDC like all IATA standards, will be an open standard available to any and all who want to use it, including GDSs. The primary driver for NDC is the revenue opportunity. NDC will unlock value through the travel agent channel by providing it with features and content that is difficult to access today.

Key revenue drivers:
- Product attributes (differentiation): ability to show competitive features that may be unique to the offer and therefore drive purchase decision
- Fare Families: displaying multiple price points, with increased value, may drive "up sells"

- Ancillaries: displaying additional products (e.g. lounge access) may drive purchase decision

Key cost drivers:
- Moving from a 40-year old legacy infrastructure to an internet environment will make change much more cost effective
- NDC should facilitate new entry, which should increase competition and drive down costs
- NDC also provides the airline with cost reduction opportunities in the areas of ticketing, payment and revenue accounting and back-office in general.

1.3. Evolution of key processes: simplification and autonomy for airlines

NDC has a direct impact on the end to end process for airline indirect distribution.
As a consequence, key stakeholders' roles evolve from today's.
This chapter focuses on those potential changes at every step of the indirect distribution process: shopping, sales, payment, ticketing and BSP reporting on the other.

1.3.1. Shopping and booking/ordering workflow evolution

In today's world, shopping and booking are mainly handled at the GDS level:
- Shopping: the GDS creates the offer, getting fares, availability, business rules from the airline or 3rd parties (ATPCO)
- Booking: the GDS creates the PNR which belongs to the TA, the airline only owning a (partial) copy.
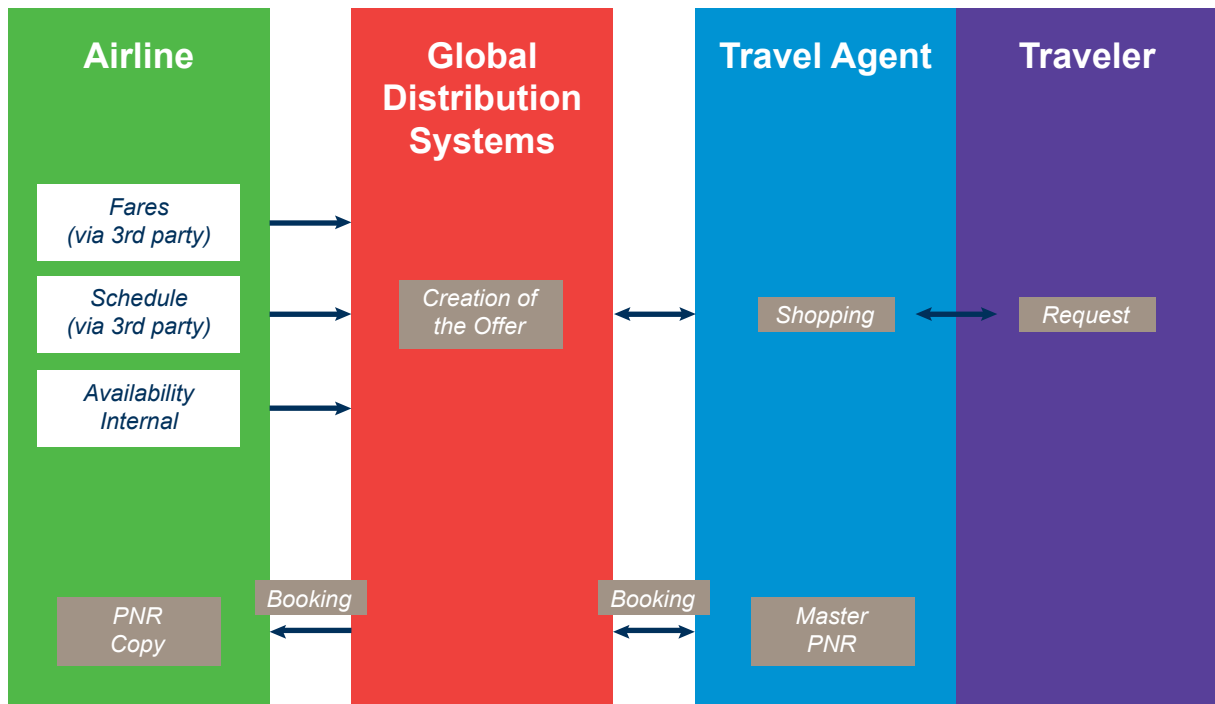
Figure 1: Indirect Flight distribution as today

With the implementation of NDC, the high level distribution and sales processes, as existing in today's world, evolve towards more autonomy for the airlines. The final business process for indirect distribution becomes close to what exists for direct sales ecommerce today, implying two major shifts:

▪ The **airline** receives the request and creates the offer.

▪ The airline is the **owner** of the master order, containing the latest information.

The intermediary, where appropriate, is called "**Aggregator**": its role is to transmit the information (request, then offer). As previously mentioned, it does not construct the offer. This role, open to new entrants, can also of course be undertaken by a GDS. This IT provider can aggregate the different offers it receives from airlines to present them to the TA.
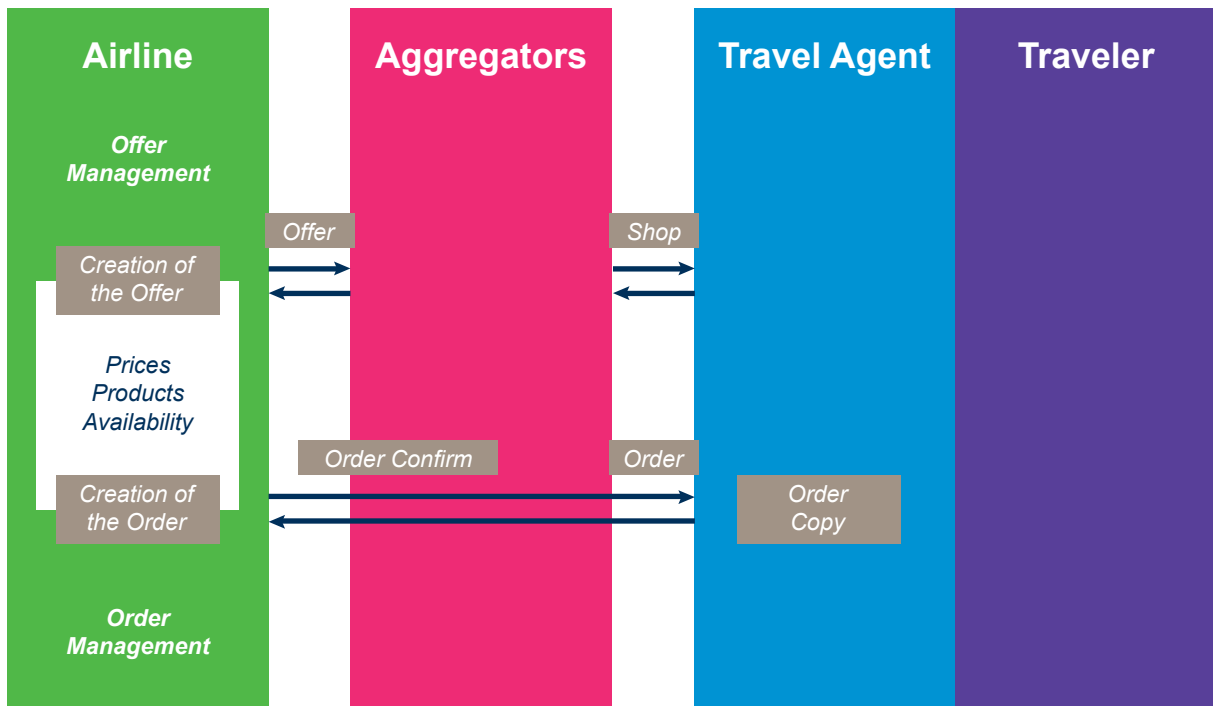
Figure 2: Indirect Flight Distribution with NDC

In the Annexe is a reference to educational videos published by IATA.

1.3.2. Payment

The Payment environment is evolving rapidly, prompted by 4 trends:

- New consumer expectations (multi-channel purchase, fast and simple experience etc.)
- Digital innovation (mobile, In-App payment, NFC etc.)
- Regulatory changes (interchange fees, ability to surcharge etc.)
- New entrants and new models (PayPal, Real online banking, instant bank to bank transfer, AliPay etc)

When managing payment, airlines have the following objectives:

- Reduce fraud
- High flexibility in terms of payment methods accepted, tailormade per country and per customer
- Lower cost of payment (both internal processing and merchant fees)
- Increase revenue by increased reach

NDC brings an opportunity for airlines to take control of payment and achieve those objectives. Ideally an airline should be in a position to create products and associate a payment instrument to them.

With regards to payment processing, there are two possibilities:

- The travel agent is merchant of record: in this case the travel agent will process the payment, accepting all sorts of payment and bearing the payment cost (customer can pay with cheque, cash, bank transfer, etc.)
- The airline is merchant of record: in this case it will bear the costs of payment, mainly credit card costs

The airline only currently identifies two forms of payment:

- Card: when credit card details are entered in the GDS (by the travel agent)
- Cash: for other forms of payment (in this case the form of payment is cash in the PNR)

When a GDS is used, card details are entered in the GDS (in the customer PNR). The GDS contacts its PSP – Payment Service Provider – that authorizes the payment. There is no extra authentication (like 3DS).
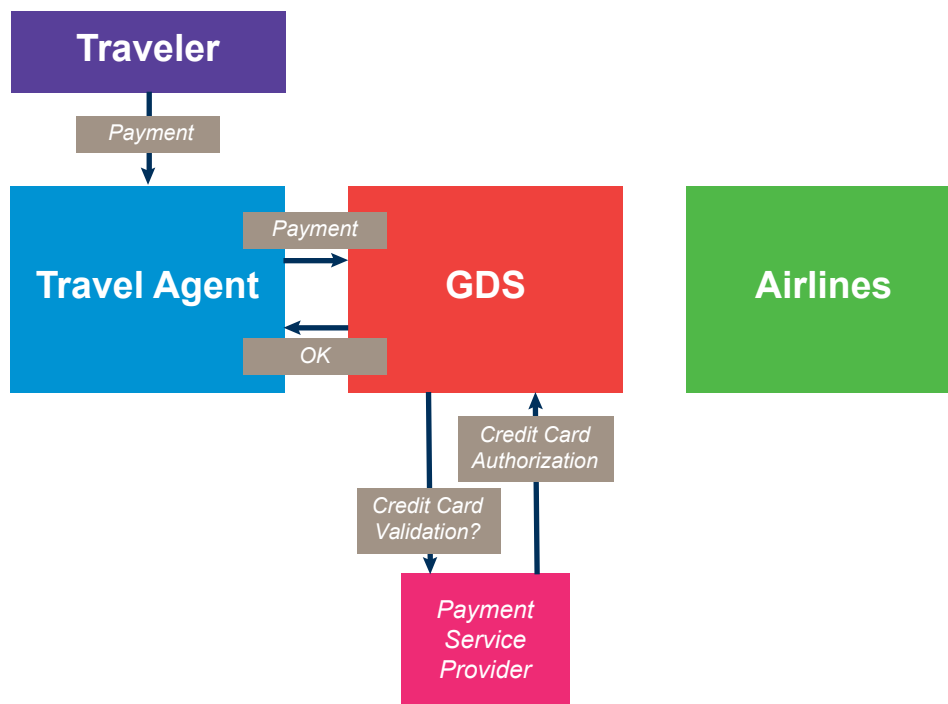
Figure 3: Payment in today's world

The NDC standard enables the airline to take back control here too. The objective is for the airline to be able to apply to its indirect distribution channel the same "state of art" payment solutions as are applied on its own website. Through standard messages, the airline will receive enough information to be able to proceed the payment itself. For a card payment it can get

- Credit card number and CCV (in case of credit card payment)
- Other relevant information to process more secured transaction (in the standard-setting process, IATA is reviewing current information and adjusting if needed at airlines' request)

The airline will contact its PSP to authorize the payment as shown on graph below.
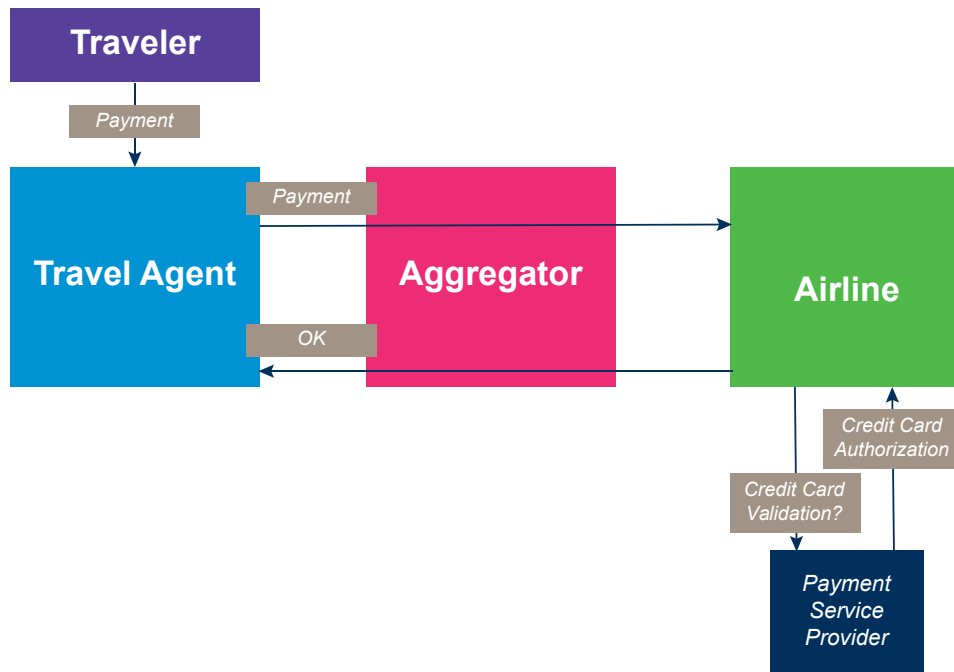
Figure 4: Payment with NDC

The most logical workflow is a simple link between travel agent and airline (either directly or via aggregator). However, other cases are possible.
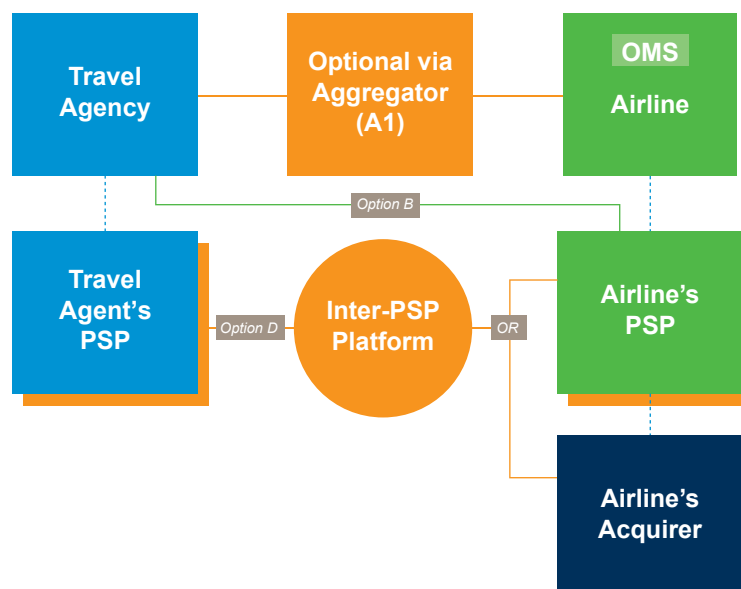
Some travel agencies (and/or some airlines) are not PCI compliant, and they could rely on third parties:

- Travel agents would process payment from their payment hosting page – managed by a PSP
- Airlines would not get payment details but outsource the function to their own PSP

In terms of payment workflows, IATA identifies two main processes:

- A base workflow where NDC order request carries enough information for the airline to process with payment
- Or a workflow whereby the airline comes back to the buyer to request extra information (this could be to process 3DS, to process other forms of payment etc.)

Detailed workflows are published by IATA in a Payment White Book which is available on the IATA website.

1.3.3. Ticketing

Today, once the payment has been accepted, the Travel Agent asks the GDS to send a ticket issuance request to the airline.
The GDS checks the airline has a current ticketing authority granted to that agent, applies a neutral ticket number according to industry rules and sends it to the ticketing airline. The airline then validates it has enough data to issue the ticket and confirms to the TA.
With NDC, the travel agent and the Airline work directly together. When the Airline is satisfied with the proposed payment, it issues the travel documents (issued on airline ticket stock) and sends the references back to the TA.

1.3.4. Revenue Accounting and BSP Reporting

Today, after the sale is completed (payment done, and ticket issued), the GDS reports the sale to the BSP that is responsible for cash collection from agents, payment of any commissions and preparation of card remittance files for the ticketing airline. The BSP confirms the transaction with a sales report to the ticketing airline that will be used for its revenue accounting processes.
Airlines conduct revenue accounting as ticket coupons become flown with revenue matched from the sales reports.

With NDC, the Airline may want to continue to benefit from the current BSP processes e.g. agent accreditation, risk management, remittance and settlement and therefore wish to report the sale to the BSP for cash collection, payment of commissions, preparation of remittance files or sales reports.
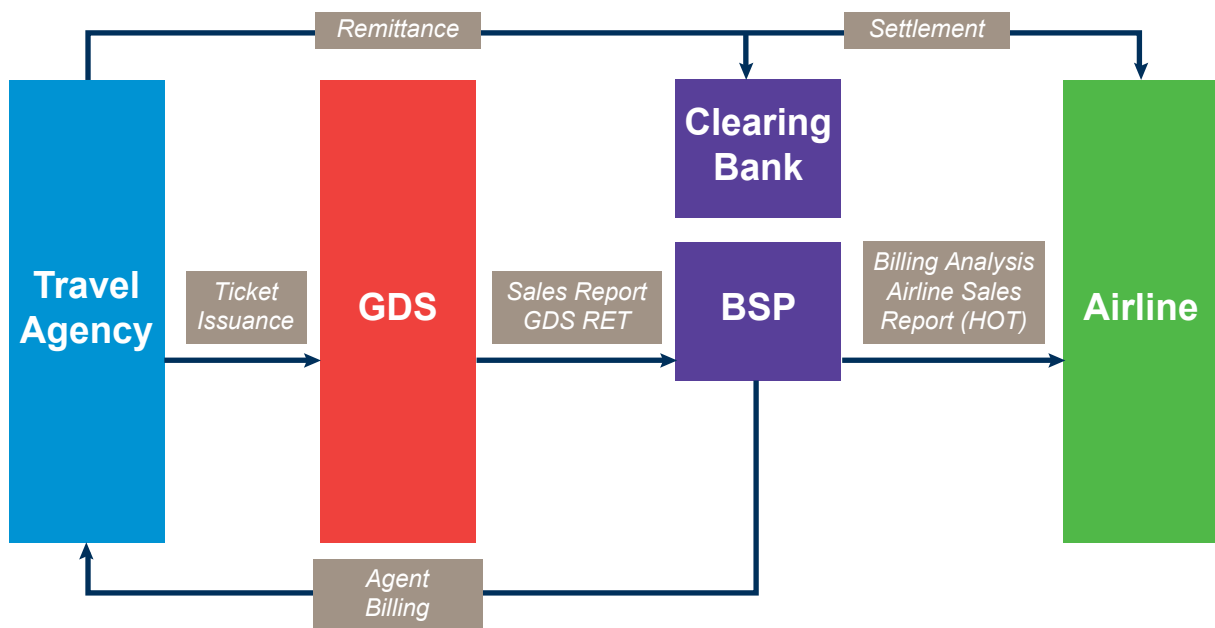
Figure 5: BSP's processes for current sales

It can do so directly in a sales report that resembles the format used by GDSs for reporting neutral tickets today – the airline would send one daily file covering global sales to the IATA NDCLink or WebLink service.
NDC airlines continue to conduct revenue accounting as ticket coupons become flown with revenue matched from the sales reports.
By reporting to BSP, airlines avoid the need

of a costly and risky parallel billing and settlement process, and can benefit from the start from a consolidated sales reporting, showing both GDS and NDC sales.
This is also beneficial for agents, as it allows a consolidated BSP remittance for all sales, seamless integration of NDC sales and improved cash flow.
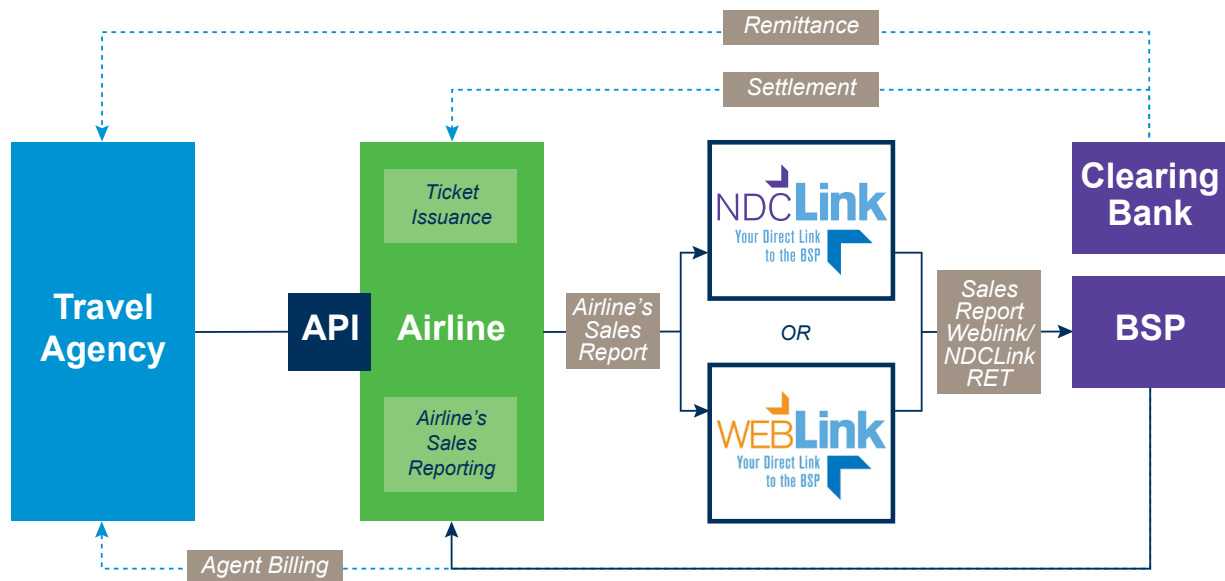
Figure 6: BSP reporting (and potential processing) for NDC sales

1.3.5. Interlining

The IATA interline system is an important foundation of industry processes, allowing passengers to buy one ticket for travel on different airlines, through-checking of baggage, and a seamless airport experience.

In today's world, in indirect distribution, the GDS constructs interline itineraries involving two or more carriers, and applies filed fares.

In this model, each participating carrier may have very little control of the revenue they expect. Each carrier is only able to calculate their share of the revenue (using industry proration

rules or bilateral agreements) when they receive the full ticketing information, which may be at the time the flight departs.

In an NDC world, while creating its offer, the airline may include the services of other airlines. The airline is responsible for obtaining content from its own interline partners.

In that case, it sends a shopping request to the partners it chooses. Those partners send back their offers. These offers will include product details, conditions, and also a settlement value which will be used for interline billing once the services have been delivered.

The airline can then create a complete offer including its own products and services, together with the services of any interline partners which it has accepted. The airline can determine the price for the complete offer, and send it back to the seller. If the offer is booked and paid, the airline issues its own accountable documents and gets the money. The interline billing with other airlines is then based on the settlement defined as part of its initial offer.

1.4. NDC Platform overview

This section describes the key elements of a possible NDC platform

1.4.1. Offer management

Offer management refers to the capability of airlines to create and return priced offers in response to shopping requests from travel agents.

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┌─────────────────────────────┐
│   ┌─────────────────────┐   │
│   │        Offer        │   │
│   │     Management      │   │
│   └─────────────────────┘   │
│                             │
│         Airline             │
│                             │
│   ┌─────────────────────┐   │
│   │        Order        │   │
│   │     Management      │   │
│   └─────────────────────┘   │
└─────────────────────────────┘
```

Offer management is included in the "NDC Shopping" request from a TA and triggers an offer creation from an airline, depending on the items contained by the request. The offer is then proposed to the requester.

The offer management platform enables airlines to distribute their full product offers and to merchandize any additional services using rich content, in an anonymized or personalized fashion.
This may include dynamic pricing.
Additional services can be those of any third party with which an airline has an agreement. They can also be an input to the platform. Offer Management will be needed to request prices directly at the airline level: it can be described in simple terms as a pricing engine.

1.4.2. Order management

Order management is the ability for the airline to create, store and manage its orders.
The Order gives an entire view of the various products and services a customer has ordered.
Order management can be as simple as ensuring the PNR, ETKTs and EMDs are referenced with a single identifier (the Order ID). An order may contain related customer information. In a second phase, order management could also be highly sophisticated as in the retail world where every aspect of the order, from product purchase, payment to delivery, is managed.

An Order is a uniquely identified record of the agreement of one party with another to receive products and services under specified terms and conditions. The NDC 'Order' supports the sale of a flexible range of airline products and services that are not necessarily journey based (e.g. subscription services). Order management enables airlines to manage NDC driven orders from booking to fulfilment.

Note: *Order Management features could naturally be extended to cover the entire lifecycle, beyond fulfillment, to delivery and accounting. This logical extension is the purpose of the ONE Order Program, please refer to section 3 of this guide for a more detailed description.*

1.4.3. Examples of features enabled by NDC

The NDC standards schemas support various features, for example:
The ability to distribute **rich content**: (pictures, videos, sound, VR experiences…): this requires that the airline can create, store, manage this content.
The ability to offer and sell **ancillaries** i.e. additional products, services or even product characteristics (this could be flexibility on a ticket where the ticket is the product, the flexibility an additional 'purchased' characteristic). In this context, own sourced products and services are in scope, as well as other 3rd parties' products (ground transportation, hotels…). Those ancillaries can be sold "**a la carte**": stand alone, to be added to a flight (or not) or **bundled** (similar to Fare Families) grouped together, as part of a global offer, with a single price.

1.4.4. Examples of functions supported by NDC:

NDC schemas allow the requester (the customer or the travel agent) to better inform the airline of who they are. In such cases, the NDC standard can support more advanced functions, which the current distribution landscape does not easily allow, such as:
Dynamic pricing: is a pricing strategy in which businesses set flexible prices for products or services based on current market demands. Businesses are able to change prices based on algorithms that take into account competitor pricing, supply and demand, and other external factors in the market.
Personalization: (or customization) consists of tailoring an offer, a service or a product to accommodate specific individuals.

1.4.5. Existing features improved/simplified by NDC:

The NDC standard not only supports Interline, but as seen in 1.3.4, it also improves the process significantly.
NDC interline goes further than the current interline process. It refers to two airlines exchanging offers dynamically: the interline partner offers the requesting airline a bid price or partner price for a flight or ancillary product or service, removing the need for proration. It allows airlines to control the revenue they expect for providing their services and simplifies settlement, eliminating proration, which is complex and can be subject to disputes.

1.4.6. Aggregation.

The concept of Aggregation is a key component to NDC-based distribution. It has three core functions, namely:
• 	Determine which airlines to ask when receiving shopping requests from travel agents
• 	Forward shopping and other requests to the relevant airlines
• 	Consolidate the offer responses from airlines and present results to travel agents

Aggregators can use the 'Airline Profile' to determine which airlines to send an offer request to. With their own airline profile, airlines are able to communicate the markets and parameters for which they are willing to respond to an NDC Shopping request for flights and / or associated services.

1.4.7. NDC general Architecture.

The chart below, widely shared by IATA, gives a global overview of all described items, and promotes modularity and standardization.
Features are organized into layers:
On the bottom, all existing applications, including PSS.
At the top the presentation layer with all possible distribution channels, direct and indirect.
In the middle, the new airline retailing layer with the two core blocks: Offer and Order Management.
The integration layer makes the links between the existing functionalities and the new ones, on a scalable and cost effective manner.
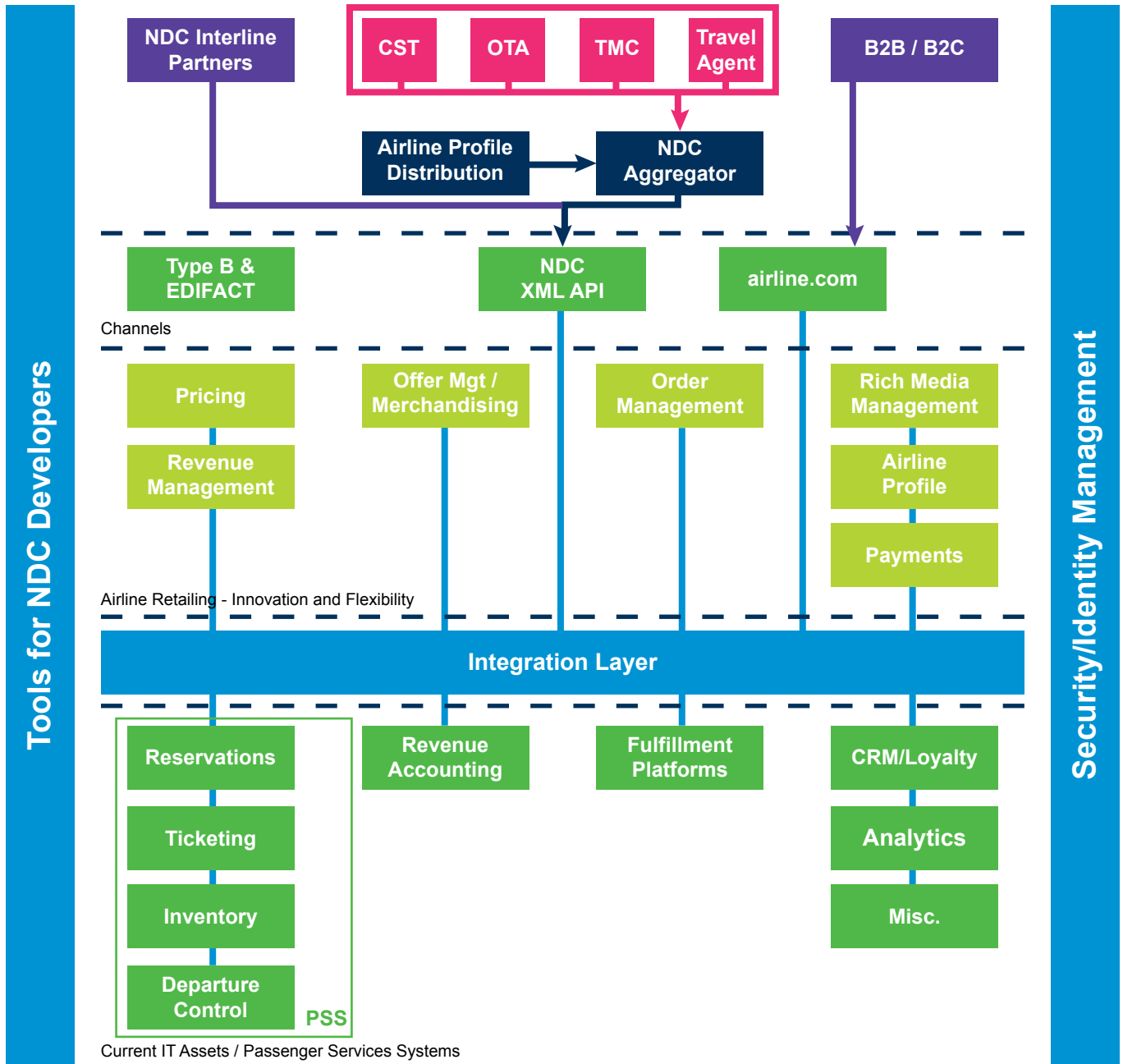Security and Identity Management module allows secure NDC end to end transactions, and well identified actors.

Figure 7: NDC reference architecture

1.5. The NDC Value Proposition:

A glance at the overall scope of NDC shows areas of both revenue and cost opportunities at every step of the general process, from shopping to payment/BSP

	Shop	Order	Pay
Revenue Benefit	▪ Rich content ▪ Ancillaries ▪ Dynamic pricing ▪ Personalization	▪ Improved bookability ▪ Reach new sales channels ▪ Manage all your customer orders	▪ Additional means of payment
Cost Benefit	▪ Simplified Interline ▪ Simplified fare filing ▪ Standard API for all indirect channels	▪ Less need for revenue integrity and ADM	▪ Simplified Interline Billing ▪ Better managed payment cost

Figure 8: NDC value proposition

1.5.1. Revenue Benefits

Revenues are a direct consequence of the additional features provided or supported by NDC, as explained above.

Rich Content allows the airline to display comprehensive content (for example: videos, pictures and description of the product), and therefore increase yield through product differentiation or gain market share.

By enabling customers to purchase relevant **ancillaries (a la carte or bundled)**, the airline generates additional revenue. The number of ancillaries sold can be increased as airlines are not dependent on implementing each ancillary with their distribution partners independently. Instead they are able to offer limitless products and services according to their marketing strategy.

In case the airline decides to implement **dynamic pricing**, it creates a potential for additional revenue through enhanced revenue management. Revenue managers get more flexibility, and better opportunities to optimize the revenue flow.

The airline might also go for **personalization**, enhance its CRM to be able to propose tailor-made offers to their customers. These offers

are therefore more likely to be accepted, and sales to increase as well as strengthening customer loyalty for future sales.

NDC Interline significantly simplifies **Interlining** and transforms this step into a new revenue opportunity. As explained above, whenever an offer needs to be completed by a partner, this can be done dynamically, with the partner making its own offer for the part it needs to cover, – for flights and/or ancillaries, hence a real enlargement/improvement of usage, especially with close partners. Typically, this can be very beneficial within an alliance.

In addition, NDC provides the opportunity for airline product to be more "sellable", by being presented to **additional channels** (direct connect to preferred travel agents, for instance, as well as via aggregators) or by offering additional means of payment. More sellable, in the sense that the airline's offer is presented in more "windows" (channels) hence more likely to be seen and sold. More sellable, in the sense that the customer has more means to pay for his purchase, and once again, is more likely to buy.

Currently, airlines are confronted – in some instances – with significant sell failures, due

to non-synchronization between availability displayed for example in an OTA (or a metasearch) and its own inventory. NDC provides also a potential opportunity to solve this, hence increasing the bookability.

1.5.2. Cost benefits

Implementation of the NDC standards can also drive cost benefits.

Airlines may choose to file fewer fares and rely on dynamic pricing. In this case, the airline's current **fare filing** processes can be simplified and therefore lead to lower costs: reduction in the cost of administration and management. Being exposed through an **additional channel**, besides creating potential revenue increase, as seen above, may also allow the airline to benefit from potential distribution savings.

In the longer term, taking advantage of the standardization proposed by NDC, a common **API** could even be sufficient for an airline to propose its products to all indirect channels. Less complexity means less structural costs.

Airlines will also save costs thanks to **simplification of the interline process**. They may not need to file the interline agreements as today. On top, interline settlement disputes could disappear as the settlement values are communicated and agreed up front, at time of shopping: interline billing is then straightforward.

As the airline produces the Offer and is responsible for the Order (booking and ticketing), it manages much more closely how its product is sold, with less risk of interference (thanks to the notion of Offer and Order ID). Therefore, a number of **revenue integrity** checks are no longer needed, and the airline (as well as its travel agent partners) can expect a significant reduction in ADMs.

Finally, in an NDC environment, the airlines retain **control of payment**: they can decide how they want to be paid, which cards to accept under what circumstance and/or implement alternative forms of payment.

1.5.3. Benefits for Travel Agents

To build NDC solutions, Airlines need to closely work with TA partners.

The NDC standard is "**channel**" agnostic. It can support a direct relationship between airlines and agents. It can also support a relationship in which an Aggregator connects to the airline to access content it will aggregate and pass on to its travel agent clients. Travel agents will find a real improvement in NDC with better access to offers and better accuracy.

A Travel agent can expect **better productivity** from its agents: they will be able to deliver more value to their customer, benefiting from richer and more consistent offers from the airlines, true comparison shopping, and transparency in pricing and content.

Better productivity for TAs could also be expected, as the current multi channels situation (several systems, for LCC and others, to sell tickets and then ancillaries, with reconciliation of data on top), should be simplified by integrated solutions, where the offer comes as a whole in one system only.

Better accuracy, and less risk of errors are also benefits to be expected. Offers as transmitted by airlines contain their conditions as a package: offer time limit, acceptable types of payment. Rules are part of the offer, therefore agents avoid interpretation mistakes (of complex fare conditions for instance) and synchronization errors which occur today with multiple entities involved in constructing an offer, and corresponding ADMs.

Travel Management companies' (TMCs) position is specific among TAs: they service both Travel Managers and Corporate Travelers. So they end up right in the middle of the debate between tightly managed travel -cost control, risk reduction- versus total freedom in business trips booking.

NDC can help TMCs propose the best of the two worlds to their customers: cost containment, reduced risk and enhanced traveler experience, as it allows personalization.

Personalization requires that each corporation deeply analyses its travelers and their needs,

hence a variety of business service opportunities for the TMC community:
- analysis of individual traveler profiles
- construction of adapted products (bundles, tailored fares)
- adjustment for SME customers
- negotiation support with the provider…

Furthermore, TMCs can provide their customers with detailed reports to validate their initial strategy choice to accept personalized offers.

They can give them the opportunity to choose whatever distribution channel is better for them (direct API, GDS?)

So NDC gives TMCs the opportunity to propose each corporate a tailored structure, and improve their current services.

IATA has produced a Change Readiness Guide for Business Travel that highlights the NDC value proposition. It covers the travel manager, the corporate booking tools, and the travel management companies. (see reference at the end of this Guide).

1.6. Current status of NDC implementation:

IATA released the first official version of the standard in September 2015. Several updates have been produced since then, the most recent version of the schema being 16.2 (fall 2016).

1.6.1.   Towards Industry Readiness:

IATA surveys about 180 airlines on an annual basis, to identify their intentions with NDC. The 2016 survey showed the following results:
-       86 of them, i.e. almost 50% have plans to adopt NDC in coming years, up from 73 a year earlier
-       23 do not have plans to adopt NDC, down from 47 a year earlier
In particular, 15 of the top 20 airline groups have adopted or are working towards adoption of the NDC standard.

Those overall figures highlight that NDC is on track to become mainstream. IATA is now forecasting that 45 carriers should be live by end 2017 (with an NDC solution). On top it expects that airlines live by end 2018 will represent more than half of all airline passengers.

Current deployments include carriers from all parts of the world. The detailed list is published and regularly updated on the IATA website.

Besides airlines, more than 30 travel technology vendors are building products and solutions based on NDC.

IATA is engaging with the industry through numerous meetings, working groups and conferences.

It organizes hackathons to get developers to build solution using the NDC standard. It has also set up an industry Business Travel Summit to gather airlines, IT providers, corporate buyers and distributors.

The next step in the NDC deployment will be to get mass market deployment and adoption, with all large travel agency networks engaged.

Airlines' views of what benefits NDC has brought or can bring in the future:

"Our NDC APIs offer customers the ability to pay for their preferred seat on British Airways flights via their preferred travel partner's website. Previously, this could only be done on ba.com. This enables more BA content to be available in more places which benefits both the airline and the customer."

Nicola Ping, Distribution Development Manager Selling & Distribution at British Airways

"Currently 1 out of 4 passengers on our website book an ancillary versus only 1 out of 100 via GDSs. We want to change this using NDC standard."

Rogier van Enk, Head of Commercial Strategy, Distribution & Data Science at Finnair

"Emirates' NDC level 2 certified API allows its travel partners to directly connect to Emirates' host reservation system, providing access to availability, pricing, shopping and ticketing, ancillary sales such as excess baggage and ground transportation services and by the end of the year Emirates will further enhance with the introduction of fare families and rich visual content."

Bill Cavendish, Vice President Distribution Strategy - Global Sales at Emirates

"With NDC, for the first time agencies can see actual products that they will be buying through the rich media content without using a GDS, and shopping experience is similar to our website."

Hugh Dunleavy, Chief Commercial Officer at Qatar Airways

"Condor implemented NDC to enrich the customer experience while booking flights and close the gap between direct and third-party sales possibilities. Access to better content beyond just the usual „price and availability" and additional rich media around ancillaries is enabling a higher quality sales presentation. Supporting live search via NDC for metasearchers, giving them 100% accurate responses, had a substantial impact on the conversion."

Maximilian Melcher Project & Account Manager Sales Systems at Condor

1.6.2. Enlarging the scope

Initially, NDC has been focused mostly on ancillaries.
Air-related ancillaries cover the areas of seats, baggage and change fees, whereas the non-air ancillaries focused on travel insurance, car services, lounge access, Wi-Fi, meals, duty free and special services such as wheel-chair and Meet and Assist. The main attributes have stayed the same since the launch of pilots in 2014, in the area of seat allocations and baggage.
However, it is very clear that carriers embracing NDC now have a much broader vision of the business benefits and embark upon a much more complete project. By building an offer and order management system, they put in place the right framework to get full NDC benefits.
The more recent NDC projects have a larger size, and impact airlines well beyond just their distribution departments. The following chapter will describe how to setup an NDC project and highlight those who will be key stakeholders.

2. Implementing NDC

2.1 Approaching the size, scope and case

The pilots have confirmed that a full NDC implementation can be a very large program and based on experience, the duration is usually not less than six months, and can go up to two years.

Nevertheless, considering the wide scope of benefits and its potential modularity, the NDC program need not necessarily be that large. NDC is not a one-size-fits-all implementation. Nor is it a plug-and-play implementation. What an airline does with NDC greatly depends on what it wants to do!

2.1.1. Size and scope of an NDC implementation

The size/shape of the program for your airline greatly depends on:
- What you plan to use it for, (what is your strategy)
- What your current status is, especially from an IT point of view.
- How you see it: as a whole or as an addition of several small projects

Airlines may choose to put the focus on Offer Management or to extend their capability to deploy an Order Management solution as well. Some might want to use NDC to deploy a more flexible ancillary platform, others may choose to go as far as dynamic pricing. Some airlines already have certain IT components, or in some cases, even some NDC capabilities (e.g. airlines that already have APIs with XML connectivity). Others will be starting from scratch with only a very basic e-commerce platform which may only partially suffice for NDC.

An airline could choose to do one large program, implementing a wide range of the NDC components. On the other hand, an airline may choose to break it into sub-projects of various smaller modules, giving priority to lower risk or higher value components, and only deciding on the next step once the first one reaches completion.

The choice of the approach may be a decision based on cost, risk, available skillsets, and other projects running in parallel. There is no 'right way' except the way that suits your airline and environment best. The most successful NDC program will be the one that you can manage in a controlled fashion.

2.1.2. Approaching the case: key questions, benefits and costs

Prior to building the business case, several considerations need to be made. They are described in chapter below.
To begin with, the airline's **contractual situation** will be a key dimension to be considered. Both the commercial contracts with distribution partners, as well as contracts with PSS and other IT system providers must be reviewed at an early stage to measure constraints, and potential costs associated with them. (See business checklist).

One more traditional early step will be to determine a **roadmap**. From a phased approach, breaking the program into small sub-projects to a big bang end-to-end implementation, the airline will need to decide what it is ready to take on. Whereas a short project with limited ambitions might take 3 to 6 months, a full transformation project is likely to last at least 2 years.

If the choice is a phased approach, then there are various options to build up the capability over time. The path an airline will choose will depend on its **immediate needs** and its NDC strategy. The steps should be defined based on the airline's priorities, not vendor availability and capability.

The **channel strategy** is also critical: which channels will your NDC strategy address, and in which order? This will have an effect on the business case, as the value derived from various channels may differ greatly. Different paths will obviously deliver different benefits, and at different points in time of each NDC journey.

The **cost** aspect of the case must be carefully reviewed as well.

There will be program-related costs as well as operational costs after the project. The program costs may include software licenses, customizations, integration efforts and implementation costs. From a business point of view, the costs for training, marketing, communication etc. must be taken into account.
The operational costs will depend on your individual choices but could include ongoing maintenance fees, support fees and yearly license costs. If your airline chooses to operate the systems, then there will be additional hardware and potentially network and storage costs to consider.

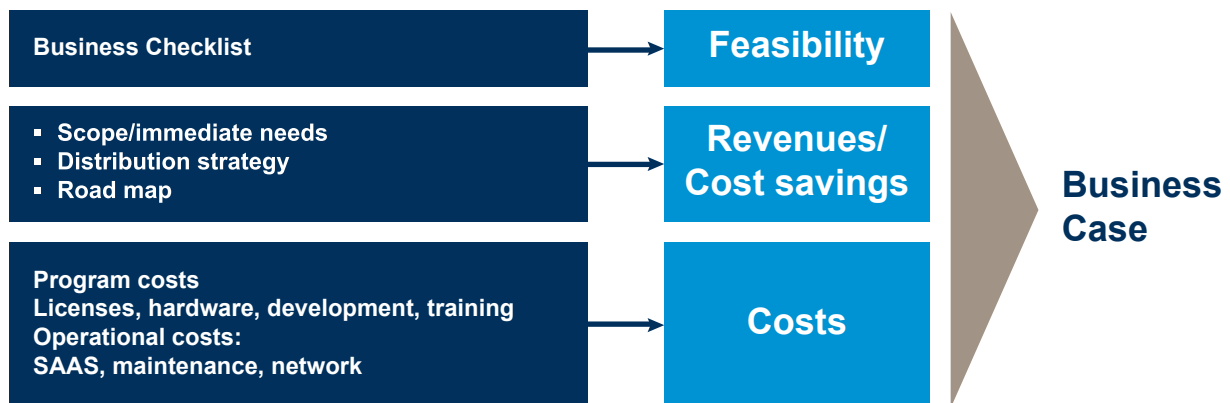| Business Checklist	→	Feasibility	
• Scope/immediate needs • Distribution strategy • Road map	→	Revenues/ Cost savings	Business Case
Program costs Licenses, hardware, development, training Operational costs: SAAS, maintenance, network	→	Costs	

Figure 9: approaching NDC business case

2.2. Program Management

2.2.1. Check the direct stakeholders

The NDC program should first set its own overarching organization. NDC is a strategic project, which involves influencing and convincing senior management. So a direct link with the executive board is mandatory. Furthermore, as with any program of this magnitude, it should have its own structure:
- Steering Committee,
- Executive Sponsor
- Program Team

But NDC also involves breaking silos, and getting departments working together. As a consequence, key departments have to be identified and actively participate from the start of the project.

The checklist in paragraph 2.3 should help the NDC program manager to identify the correct departments and their possible roles within the program.

Each airline is of course unique in how the organizational structures and responsibilities are assigned, thus this can only serve as a high level guideline. Airlines will need to adapt this for their own use.

2.2.2. Distribution, Marketing and Sales

As NDC is a distribution-focused program, this department should typically take a lead role in the overall program.

Depending on the organization of the airline, Distribution might be a stand-alone department or depend on Marketing and Sales. In any case, reflecting its key role in defining the products (for instance by creating a new ancillary), this department has a prominent role to play.

The distribution representative must ensure the NDC strategy is a key enabler to the over-all distribution strategy and will play a critical role in coordinating and communicating with the various distribution channels and partners throughout the program.
The program will affect stakeholders outside of the airline, such as travel agencies, travel retail companies and corporate buyers. Those external contacts are critical to its success.

2.2.3. Revenue Management and Pricing

Many components of an NDC program will be influenced by Revenue Management and Pricing (RMP). For many NDC features, especially dynamic pricing, RMP will be the driver behind how these mechanics will work, and will shape the business requirements for NDC usage and any NDC platform(s). They will also be heavily involved in determining the ancillary offerings and their prices.

Dynamic pricing is a highly complex component requiring substantial attention and testing. The RMP department must be represented in the core NDC Program team to ensure that items such as platform assessments also cover their requirements.

2.2.4. Information Technology

The technology or IT department will carry a large portion of the program execution efforts. While this is not a pure IT project, the (new) IT platform(s) are the key enablers to all features in the NDC standards. The involvement of the IT department in the platform assessment and overall program setup will contribute greatly to its success.
In order to fulfil the **complex business requirements** of the various business departments, the IT department must be clear about their requirements, as early as possible. A wrong platform assessment early in the process due to a lack of understanding will cost time and have negative consequences throughout the program, and even after the program is completed.

In their assessment, the IT department should consider factors such as overall architecture as well as scalability and integration. The ability of these systems to grow with the

volume and transactions over time will be paramount to providing a sustainable IT environment.

A strong and consolidated vision will be mandatory to build the architecture the airline needs to implement its business strategy.

The IT department will also have to focus **on integration**. Various system components will need to interact and interface with each other for the components to work seamlessly, for example PSS, ecommerce systems, merchandising components, new NDC components, payment systems, etc. It is recommended that the IT Architect puts a strong focus on integration and modularizing processes at a very early stage of the evaluation of the platform(s).

2.2.5. Finance and Revenue Accounting

Another key stakeholder in the NDC program is the Finance department. Within the realm of Order Management, and in that area specifically payment processing as well as financial accounting (settlement and billing), there is a large potential for efficiencies.

For instance, if the NDC strategy involves additional distribution channels, additional payment methods via the new sales channels will be an additional challenge. It will likely include a wider variety of payment options in multiple countries.

2.2.6. Program Management

While Program Management isn't a department per se, it is worth mentioning this role specifically. Prior to the start of the program, ideally during the assessment phase, a program manager will need to be assigned.

There are differing policies within airlines as to where programs report. In some cases, program management is done in IT, in others, it sits in the business departments. In the case of NDC, IATA recommends that the selection

of the role and the respective reporting lines be carefully considered. In any case, the NDC program is a business program, with a business goal. The program manager will need to be close enough to business departments to share their language and clearly understand the business purpose of his program, both initially and as the program develops. The size of the program may have an influence in the reporting position. A smaller NDC program which may require a few updates within various IT systems but less overall coordination with business units and external entities, may well be driven by the IT department.

However, a larger NDC program with strong dependencies on pricing, on channels distribution and other business related topics may benefit from having key stakeholders such as the distribution team take over the program management responsibility, to ensure the outcomes meet the expectations of the business.

In even larger programs, IATA recommends that program ownership rest with the key business stakeholders, with project managers in the various departments such as IT to focus on the various sub-projects.

2.3. Business check list

Where are you limited in the distribution of your product today? What would you like to improve? Those two questions should be your starting point for NDC.

This chapter provides check lists, with questions to be answered in the different domains, whether by the Program Manager (internal to the Program) or by the Departments which are close to the program. Those questions should be answered prior to starting the program, and the answers well shared and communicated.

Specific questions for the program itself (organization, stakeholders, communication reporting) conclude the chapter, as an internal check list of the program.

2.3.1. Global Strategy and Distribution Vision

Where do you want to go by implementing NDC? What is your final goal, what would you like to achieve? Strategic questions are the core of the program.

It is the first task of the program manager to ensure that the vision around NDC is as clear as possible. So here is the corresponding list of tasks:

Ensure that NDC vision is well understood and shared among the stakeholders, top managers and especially sponsor.

Define your own high level NDC strategy

What is your distribution strategy: direct sales, all channels? Create a new channel with NDC?

How do you want to use NDC: which parts, which components? Which are the current gaps that you would like to fill with NDC new features?

Ensure that the various business units adapt their strategy and roadmaps to cater for the NDC strategy. Involved departments include, but may not be limited to:
- **Distribution**
- **Revenue Management & Pricing**
- **Sales & Marketing**
- **Ecommerce**
- **Ground Operations**
- **Revenue Accounting**
- **IT & Technology**
- **Customer Experience**
- **Legal**

2.3.2. Marketing and sales strategy, ancillaries' development

NDC requires a good definition of your product, without the current constraints of today's distribution

Define your overarching ancillary sales and merchandising strategy: are you aiming at distributing internal ancillaries, 3rd party ancillaries or both?

Are your distribution processes defined and aligned with NDC distribution?

Where do you want to sell (which markets)?

Understand your distribution ecosystem (related to NDC) and who your partners are which support NDC (direct and via an aggregator)
- **Who will consume your content and how?**
- **Who and how will sales / customers be serviced?**

Ancillaries: go further:
What do you want to offer short term? Which products can provide quick wins and quick implementation?
What do you want to offer mid- to long-term? Which products are more complex to fulfil or service?
What are your competitors offering? Do you want to align or differentiate?
How well are your sales channels aligned in what you offer? Do you want to align or do you want to differentiate?

2.3.3. Business process engineering

NDC will change the distribution process, but processes after sales will also be affected. Here is a review of the different aspects to be checked:

Define services provided for the sold items in case the customer is requesting (voluntary change, cancellation…).

Define services provided for the sold items in case of disruption (involuntary change…).

Define consequences of system disruption.

What is the agency support in case of direct connect? In case of an indirect non-GDS sale?

Analyze and measure the potential consequence of internal servicing of the order.

Complete a high level processes map to identify the affected organization and processes.

Check the training that might be necessary.

2.3.4. Link with IT

This list will remain high level (see next chapter for the platform assessment itself)

Communicate with IT to ensure that the NDC business strategy is shared.

Idem for business needs and requirements.

Share with IT the potential difficulties of NDC integration within the existing architecture, define specific points (applications) of complexity.

Check if IT would cope with such a program: e.g. scope of project, volumes of transactions etc. Will external help be needed?

Check the understanding of data privacy for IT.

Check data security and PCI compliance.

Check the IT procurement part: type of contracts: SAAS, self-hosted?

Are current systems capable to be updated or already at the limit of their capability?

2.3.5. Legal

Both Legal and Procurement need to be prepared for NDC. Implementing an NDC based solution can be disruptive if an airline launches innovations and new processes. Contracts often include clauses that might restrain the airline from moving forward towards those new behaviors.

Review PSS contracts
- **Restrictions on distribution by channels**
- **Restrictions/Costs of 3rd Party integration**
- **Restrictions on data access**
- **Restrictions on using other technology suppliers**
- **Transactions definition, volumes and costs, in particular for those associated with offer creation**
- **Search costs, costs related to merchandising**
- **Is NDC mentioned, and how?**

Review GDS contracts
- **Restrictions on distribution by channels**
- **Content supply obligations**
- **Restrictions on distribution by markets**
- **Type of fares**

It is key that the current distribution agreements are reviewed to ensure that they are not being breached. Restrictions in place must be either renegotiated with the GDS or reflected in the NDC strategy.

Review contracts with 3rd party content providers
- **Restrictions on distribution by channels**
- **Restrictions on distribution by markets**
- **Restrictions on distribution methods**

It is key that the distribution agreements are validated to ensure that they are not being breached. Potential restrictions in place must be either negotiated with the content provider or reflected in the NDC strategy.

Review contracts with other service and data providers. What are the parameters associated to:
- **CRM data usage**
- **Payment gateways and services usage**
- **Data volumes**

Personal data privacy: NDC schemas must make sure that, when customer's data are shared, it is on a voluntary basis, the customer may be willing to say more to enable being offered personalized deals. Nevertheless, the subject needs to be carefully looked at, and personal data should not be passed from one stakeholder to another without the subject's knowledge and consent. In addition to personal data, this privacy requirement will also apply to payment details.

Ensure that the various departments understand legal and contractual implications which will affect their business unit:
- **Distribution contracts**
- **IT contracts**
- **Data privacy**
- **Payment standards and rules (e.g. PCI-DSS)**

2.3.6. Project organization / External support needs

This is in addition to the previous chapter, which focused on which department had to be part of the core program.

Define what supporting documentation you might need to help you with the strategical part of NDC

Identify the involved departments and stakeholders in each department (see above)

Clarify expected involvement of stakeholders and corresponding departments. Identify external stakeholders and contact person in each organization

Create a relationship map (internal + external stakeholders +status (supportive, neutral, opposing, influencer…)

2.3.7. Communication

Communication is extremely important to the success of any large project or program. Having the right communication to the right audience, and just as important, having predictable communications (e.g. update to executives every two months) will not only give everyone involved peace of mind, but also show that things are under control. Prior to the NDC implementation program being initiated, communication is equally as important to build support and momentum, as well as alignment.

Create the key message (benefit, involvement, expectations) for each stakeholder and their department for external communication

Define templates and channels of communication

Ensure that the global strategy is shared

Share the global NDC vision (internal/external)

Ensure that the ancillary strategy is known and understood by all stakeholders

Ensure that the distribution strategy is shared and agreed upon

2.3.8. Project metrics and reporting

Define metrics to measure the success of the NDC program and strategy. What are the targets within 1, 3 or 5 years?
Revenue
Units (e.g. ancillaries, flights, clicks etc.)
Cost to build
Cost to operate

Is there a reporting mechanism in place to communicate the success of the NDC program and allow this to be related to the business metrics?

2.4. Platform assessment

2.4.1. Matching Platforms to Capabilities

Selecting a vendor NDC platform should not only take the first delivery phase of the program into account (definition of the needs), but the following steps of the NDC roadmap as well – indeed, it is important to select a platform which best supports the airline's entire NDC roadmap.

At any point in time, each vendor platform/offering will be different (e.g. in terms of functionality support- …) and these differences will evolve over time. Thus, it is also important to understand vendor roadmaps as well as current offerings.

The following chapter gives further advice for the NDC platform assessment / selection phase.

2.4.2. Completing the Platform Assessment

At this stage, the NDC readiness is nearing completion. The features and functions list has been used to identify the key requirements towards a solution, and perhaps an RFP has been issued or at least high level discussions with various vendors are planned to understand the capabilities of their products and their roadmap.

There are a number of important criteria above and beyond the functional capabilities of the solutions which should be taken into consideration. Some of these are examined below.

Vendor type

The question many airlines will need to consider is which type of vendor they would be comfortable working with – a larger company with the typical safety net and access to a large resource/expertise pool, or a small, dynamic company with a more agile approach? Are there language or cultural topics which

need to be considered as this will be a long term relationship? Is there a corporate push to reduce the number of supplier relationships, and therefore a need to focus vendor selection on companies with existing relationships: for example, in the PSS or e-commerce domains?

The vendor should always be seen as a long-term partner in this area, as the NDC environment is developing and it is certain that there will be changes on the airline side and within the industry, and the NDC platforms will need to evolve accordingly.

Product roadmap

As stated earlier, the NDC standard, while out of its infancy, will continue to evolve. Indeed, the quality of the standard is improving with each pilot and live implementation, and with each task force and working group meeting. This continuous improvement also means that NDC vendors will need to continually enhance their current products with additional features and functions. A vendor should have a product roadmap to reflect this. How much will be invested and in which areas? Does the vendor have a strategy for its product that aligns with your specific current and future needs? How is the vendor's track record in following roadmaps, investment plans and industry trends? Of importance to an airline may also be which service level agreements will be in place for product and feature delivery, e.g. what will be delivered by when and how robustly?

A review of the vendor roadmap will help align expectations over the next few years and improve the chance of a successful long-term airline / vendor partnership

Architecture

Key architecture principles – namely modularity and standardization – should guide the vendor/platform evaluation process.

An architecture should be **modular**. A modular system leverages existing assets and at the same time allows the addition of best-of-breed functionality as it becomes available. This modularity will allow airlines to respond rapidly to changes in their business environment. It will minimize the impact that changing one process will have on others.

These modular building blocks should support **standard** interfaces. This will clearly drive development and integration costs down. It should indeed simplify the way IT assets are constructed and operated; and the way they are inter-connected.

One key example for modularity and standard is the portability of the solution in case of **PSS change**. PSS' position is often central in the architecture of an airline. Since PSS changes are recurrent in the industry, one needs to ensure that the architecture is not PSS dependent. At least, dependencies should be limited or well understood.

One of the direct consequences of applying these two principles will be to transform the airline landscape into a more modular environment – a modular environment where valuable existing assets are leveraged, obsolete assets are renovated, and new assets can be added easily.

Clearly, this can only happen in the context of a framework integrating all these modules in a coherent manner.

When building its architecture, one should not forget a third mandatory asset: scalability. With NDC, the airline systems are now key in distribution flows and manage large volumes of data (shopping, offer management).

Integration capabilities

In the context of a modular landscape, NDC platforms will need to leverage existing integration capabilities or bring their own capabilities.

From a technical perspective, a number of key questions will need answers: e.g. is there already a stand-alone integration in place?

If so, what specific integration scenarios are supported? Which integration scenarios are required between NDC platforms and supporting systems? Are there standardized API's for these surrounding systems? How much will this integration cost (e.g. in terms of resources, timeline)? What will be the support model for this integration piece? How much volume is expected? Are the interfaces secured? How to minimize unwanted shopping requests e.g. non applicable, robotic phishing? Clearly, these are just a few of the questions to be raised, and this area is best reviewed in detail by the airline's IT department.

Support model

Different support models are available: e.g. from dedicated, local resources to centralized global helpdesk with specific coverage. It is important to discuss within the organization, both business and IT, what type of support coverage is needed. In terms of support model, it may also be useful to separate between two phases: hyper care (in the first months after deployment) – and normal operations (after the hyper care period). The needs for these two phases may well be different.

Within the realm of support, service levels for operations, maintenance and support must be carefully examined and matched to the airline's needs. Understand the support models the vendor can offer, understand associated costs and ensure that these align with your needs and budget.

As it is also part of the provider support, the airline should also consider its potential needs for (private) developments: how its provider reacts to change requests: what is its time to market? What is the maximum size of changes allowed? What costs are to be expected?

As a summary for your NDC Program:

SIZE, SCOPE and CASE	PROJECT SET UP	OVERALL CHECKS	PLATFORM ASSESSMENT
▪ Product strategy ▪ Dynamic pricing, personalization focus ▪ Commercial & distribution strategy (B2B, B2T) ▪ Payment strategy ▪ Revenue vs cost focus	▪ Decide on Business owner (Distribution, Marketing , Sales) ▪ Involve Stakeholders (Finance, RA, RMP, IT) ▪ Define a Steering Board ▪ Define overall planning and steps ▪ Organize internal & external communication	▪ GDS contracts ▪ PSS contracts ▪ Market readiness (travel agencies, corporates) ▪ IT overall integration ▪ Impact on IT systems (RMS, RA etc) ▪ Servicing ▪ PCI DSS	▪ In house or external ▪ List of certified vendors ▪ Platform assessment ▪ Integration complexity ▪ Modular approach ▪ Overall cost ▪ RFP

Figure 10: Summary of an NDC Program's major steps

2.5. Certification

In October 2015, IATA launched a certification process for validating the technical capability of actors to deploy all or parts of the NDC standard.

2.5.1. Goals

The goal is to provide transparency on existing NDC deployments; to validate the capability of supporting IT providers in these instances and also to protect the NDC brand and support NDC early adopters.

2.5.2. Scope

What does the certification measure?

The certification process measures the capability to receive and send NDC messages, from a seller or an airline perspective. It validates specific NDC end-points as opposed to generic products.

Here, IATA certifies the messages, not the underlying architecture and processes or workflows.

Who can be certified?

Those who ensure deployment:
- For Airlines: any airlines that deploy an NDC API
- For distributors: any travel agent or aggregator that consumes these APIs
- For those who propose products: any vendor that offers NDC products for airlines and distributors.

Levels and definition:

The diagram below illustrates the 3 levels that IATA will certify:

2.5.3. Certification process

The process is the following:
Step 1: Airlines, Distributors and IT providers apply for certification. They complete the certification form, capture live NDC messages and send the trace to IATA.

Step 2: IATA as certification authority, validates the trace.

Step 3: the certification creates an official notification, the requestor is published as certified on the NDC certification registry, and is given the authorization to use the IATA NDC Certified/Capable Logo.
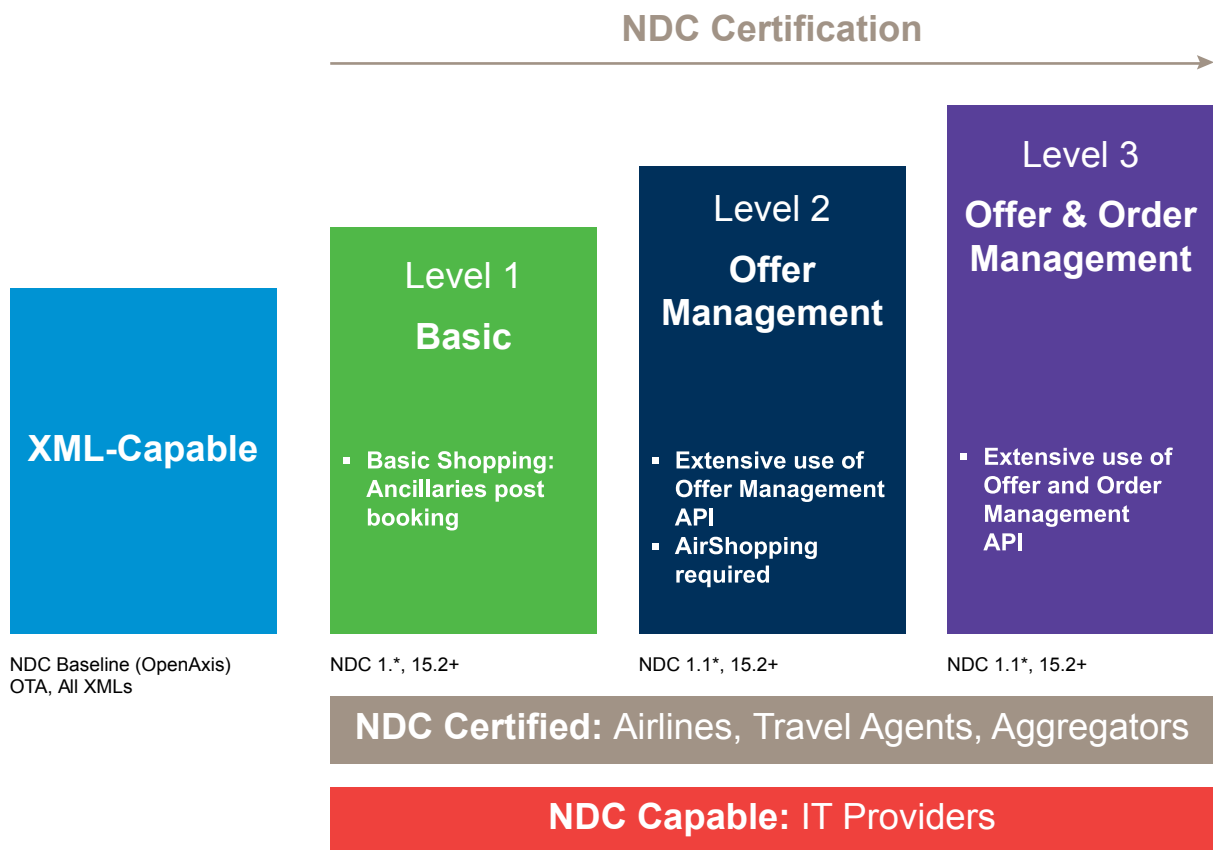
NDC Certification

XML-Capable	Level 1 **Basic**	Level 2 **Offer Management**	Level 3 **Offer & Order Management**
	▪ Basic Shopping: Ancillaries post booking	▪ Extensive use of Offer Management API ▪ AirShopping required	▪ Extensive use of Offer and Order Management API
NDC Baseline (OpenAxis) OTA, All XMLs	NDC 1.*, 15.2+	NDC 1.1*, 15.2+	NDC 1.1*, 15.2+

NDC Certified: Airlines, Travel Agents, Aggregators

NDC Capable: IT Providers

Figure 11: NDC certification levels
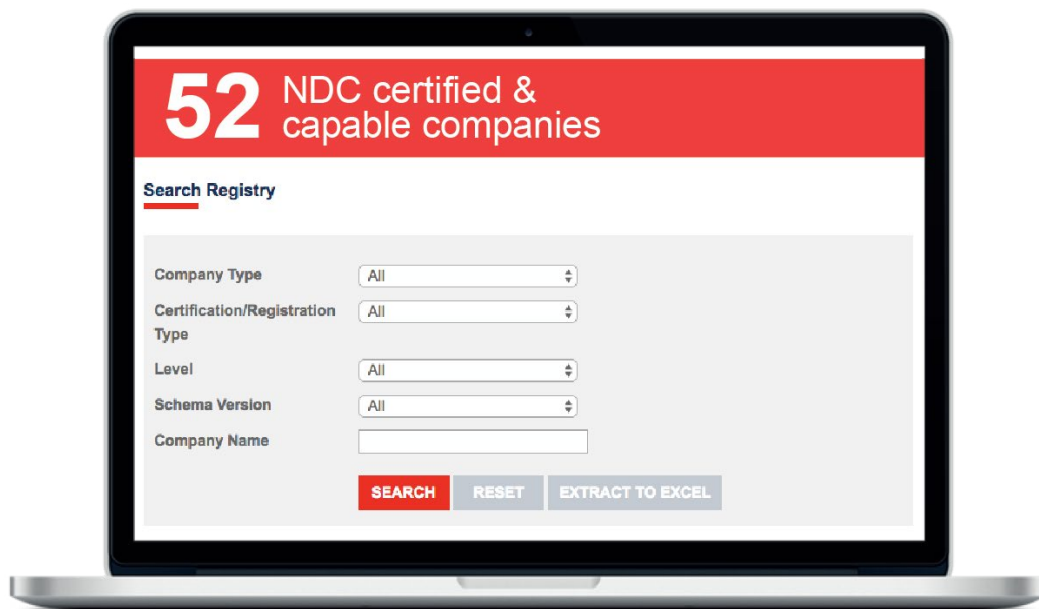
2.5.4. Current results

Figure 12: Certification figures - September 2016

NB All airlines that are live with NDC have requested certification.
For more details, access now the NDC Certification Registry . This page lists the NDC certified airlines and the NDC capable actors.

3. Towards an Enhanced and Simplified Airline Distribution

NDC can now be seen as the first step of the ongoing modernization of a 40-year-old ecosystem (messages, workflow, architecture…) The whole industry is changing to improve its existing features, copy/pasted from a paper based industry, and adjusting them to our web based world.

Next step is ONE Order, and more steps are to be expected.

3.1. ONE Order: an additional step forward

As far as Order Management is concerned, NDC covers from booking to issuance of accountable documents (ET/EMD).

ONE Order goes further by transforming the

Order into the only reference any stakeholder of the industry needs when it comes to a customer journey.

ONE Order modernizes the order, delivery and accounting processes beyond today's ET/EMD and PNRs/SSRs. It replaces the current booking and ticketing records and combines the content of those into a single retail and customer focused Order. All entities involved in travel and fulfilment, from the customer to the third-party service providers, will access the single record to get the required insight and make necessary updates to any given trip.
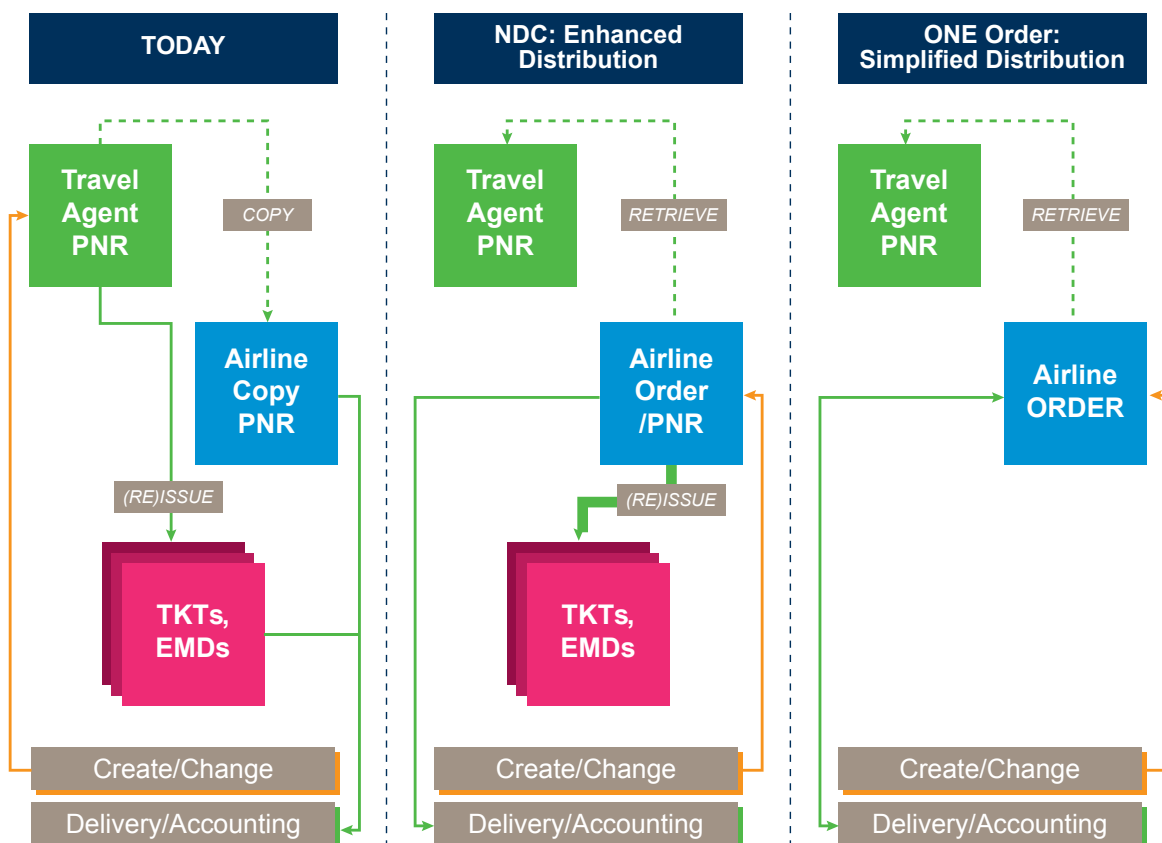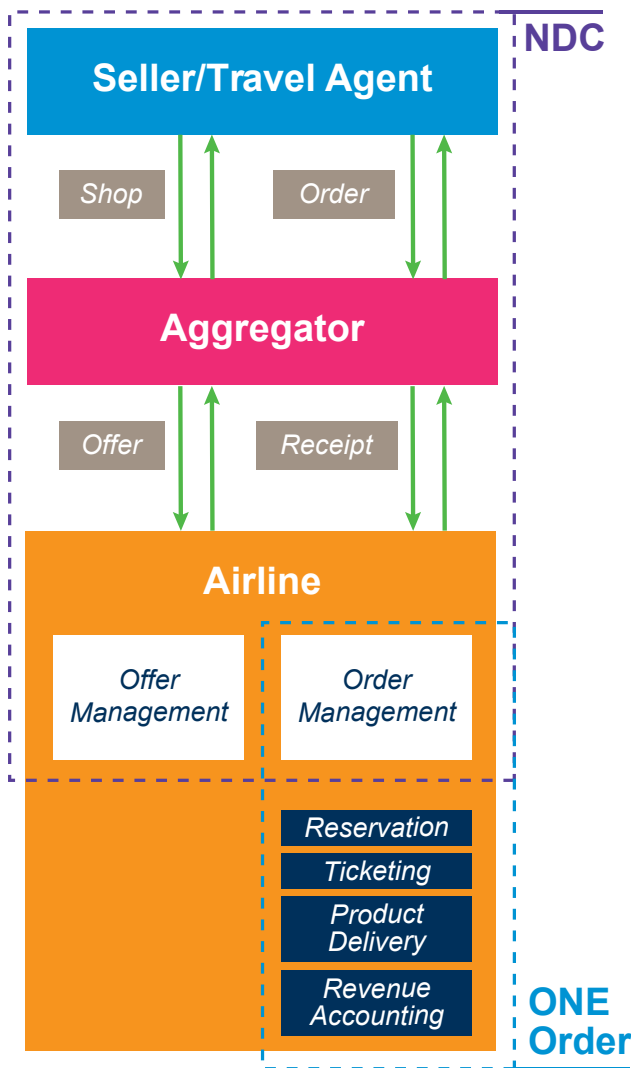

Figure 13: From current situation to ONE Order

The table below clarifies the ONE Order Program scope against NDC's and lists the additional benefits it brings to indirect distribution.

Figure 14: NDC and ONE Order scope in Indirect Distribution

ONE Order Simplifies Distribution:
- Sets the Order as the only Customer Reference/Receipt for any stakeholder
- Disposes of ticketing processes and avoid out of sync documents
- Standardizes retailing solutions
- Facilitates interlining with ticketless carriers
- Allows lighter Revenue Accounting

Completing NDC, One Order also supports simplified processes for the direct channel, particularly in interline scenarios.

3.2. NDC and "ONE Order" Order Management architecture model

The overall end state architecture for NDC and ONE Order foresees an offer management component, an order management component and a unifying integration layer through which conversations with external systems, partners and parties are held. The offer and order management capabilities may be delivered from a single system, or from different systems.

The Order Management System allows airlines to retail core flight and flight ancillary products with non-air ancillary products such as hotels, cars, trains and products and services from third parties.

At the core, the Order Management System plays the role currently covered by the reservations modules of a standard PSS. It manages the reservation and ticketing-related processes with order records as opposed to PNRs, ETKTs and EMDs. Ultimately, the Order Management System will allow airlines to retail core flight and flight ancillary products.
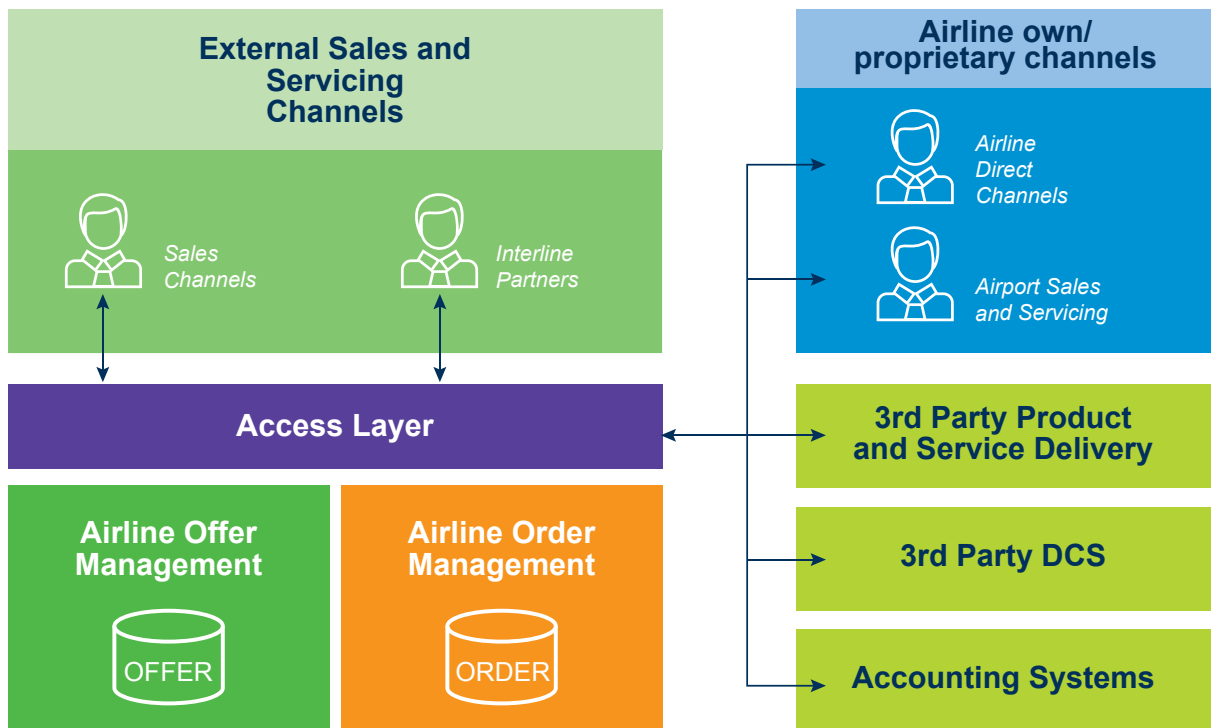
Settlement via BSP/ARC not covered in these illustrations.

3.3. ONE Order Program Roadmap:

In December 2015, the IATA Board of Governors approved the initial phase 1 of standard development of ONE Order.
Since then, various task force meetings have taken place, with many stakeholders from the industry: Airlines, IT providers and GDSs. The expected outcome of those meetings is definition and development of specific ONE Order messages to complete NDC's.

ONE Order standard messages focus on delivery and accounting: they are to be used for exchanges between the Airline and its Interline Partners, 3rd Party Delivery Providers (DCS, Ground Handlers or others), and Accounting Systems.
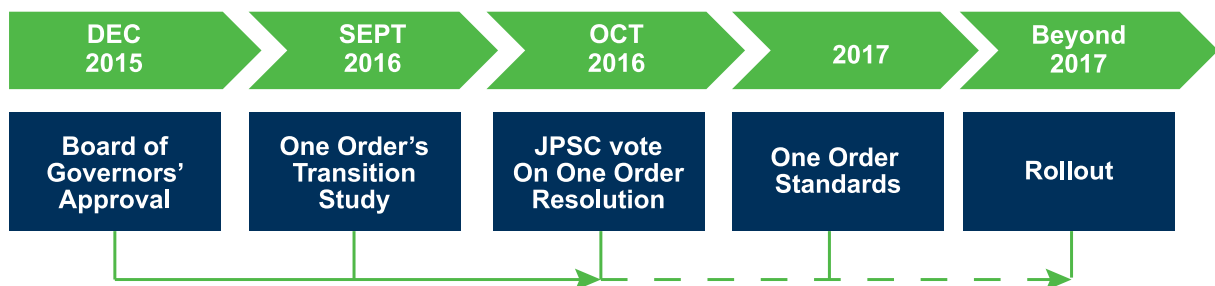

Figure 15: Key Dates for ONE Order

3.4. Transitioning to ONE Order

ONE Order has great potential to drive incremental revenues and lower costs. In particular, a ONE Order rollout considerably increases the business case for implementing NDC Order Management and achieving its back-office simplification benefits.
The transition to ONE Order is a large scale transformation project of which the cost and resulting return on investment must be evaluated individually for each airline. It also requires close cooperation with industry partners.

In any case, it is likely to allow a real technology refresh for any airline or system provider willing to go down that path.
As a disruptive change, it will require strong internal support, as benefits and drawbacks are obviously very different from one department to another (see table below).

	Sales	Strategy	Finances	IT
Benefits	Enhance customer service and simplified processes	Industry Game changer and improved interlining	Standardized retailing and accounting processes	Technology refresh
Drawbacks	Long timeline	Industry dependent	Legacy mindset	Complex transition

3.5. Going beyond Enhanced and Simplified Airline Distribution

While NDC is increasing airline control and flexibility, ONE Order is substantially reducing the complexity generated from an historically paper based industry. Together, those industry transformation projects are putting in place the long term framework of Enhanced & Simplified Airline Distribution.
Renovating Distribution is a long term path for Airlines. Ancillaries and rich content are only the first benefits from a first step.
Innovative features are becoming reality using first NDC (dynamic pricing, personalization) and soon ONE Order (Unique reference for traveler, retailing Order Management solutions, lighter revenue accounting).
Inherited structures from the past, that seem deeply attached to Airlines distribution are likely to evolve (Payment, Revenue Management Systems, Passenger Service Systems) or even could disappear (Booking Classes). It is useful to benchmark airline industry to other industries and identify the heavy influence of legacy processes and systems, and the challenge to adapt them. The journey is only starting!

4. Conclusion

The first set of NDC industry standards is now available, and NDC is now becoming mainstream. With this guide, IATA hopes to help all airlines prepare to take full advantage of the benefits NDC will bring.

If you have followed this 'Change Readiness Guide' for your NDC enablement, you should have the most important areas covered, and a good understanding of what it will take to successfully execute an NDC Program. You are now well prepared.

But like all change management processes, effective communication is absolutely vital.

That means taking the time up front to engage with all of the distribution chain and your customers (agents, corporates…) to ensure you create an NDC enabled proposition which will resonate.

We wish you a successful NDC journey, and we hope this guide serves as a useful tool – one of many in the IATA NDC Toolkit. We welcome any feedback you have that could enhance this guide.

The NDC Change Readiness Guide was written by the IATA NDC Team and with the support of Hélène Millet, Conztanz Consultant.

Thank you.

5. Annexes

5.1. Annexe1 : IATA resources

As indicated in the guide, IATA has produced Tool Kit and various documents to help NDC Implementations. Here are the various references

5.1.1. General NDC related information

WHAT	WHERE	NOTES
NDC Microsite for airlines	**startndc.iata.org**	'GoTo' location for all NDC related supporting material produced and provided by IATA. Includes videos, standards, architecture, financial support, program management support, regional NDC contacts
NDC within IATA	**www.iata.org/ndc**	Various content and links to training, NDC videos, standards, governance, etc
Video Tutorials ▪ Introducing NDC ▪ Understanding NDC ▪ Adopting NDC	**Startndc.iata.org**	A series of very short videos which provide detailed descriptions of the workflows in an NDC landscape.
NDC Pilots Year End Reports	**www.iata.org/ndc** then select 'Pilots' from the tabs	Pilot reports are available for 2013, 2014 and 2015 at the bottom of the page as PDFs
NDC for Business Travel	**NDCbiztravel.iata.org**	Best place to go to understand how Travel Agents and Corporate Buyers see potential benefits from NDC
ONE Order	**www.iata.org/oneorder**	All contents and references on the ONE Order program
Certification Registry	**NDC Certification Registry**	Updated details on NDC certified airlines, NDC capable IT providers...

5.1.2. Reference supports

1. Implementation guide :

This document provides clarifications and explanations of the concepts and scope underpinning the New Distribution Capability (NDC).

It is intended for business, operations and technology individuals considering or actually involved in the implementation of systems and processes that will utilize NDC standards, whether they be an Airline, Aggregator, Seller or travel Management Company.

Please find out more
http://www.iata.org/whatwedo/airline-distribution/ndc/Documents/ndc-implementation-guide-v3.pdf

2. Certification page

To go further with certification (as explained, all related documents concerning the certification (including the actual form for applying))

http://www.iata.org/whatwedo/airline-distribution/ndc/Pages/default.aspx

5.1.3. Reference for developers:

NDC schemas	www.iata.org/ndc then select 'Schemas' from the tabs	Pilot
NDC Developers Portal	ndc.developer.iata.org	
NDC Sandboxes	ndc.developer.iata.org	

5.2 Annexe 2: Regional NDC Managers:

For local advice on NDC, please contact the regional NDC Managers

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