**Business Requirements Document**

**NDC 1: Airline Shopping**

*Date:  23 October 2013*

**Document Status**

**v. 1.79 FINAL REVISION**

Workgroup members or interested parties should send their comments and requests to DDXWG Steering Group at DDX-SG@iata.org

# Revision History

| Version | Date | Name | Description of Change |
|---------|------|------|----------------------|
| 1.0 | 10/7/13 | Andrew May | Initial Draft |
| 1.1 | 18/7/13 | Andrew May | Taskforce review revisions |
| 1.2 | 22/7/13 | Andrei Grintchenko | Linked Shopping Requirements with existing XML messages in scope of Shopping |
| 1.3 | 24/7/13 | Andrew May | DDX Steering Group revisions |
| 1.4 | 26/7/13 | Andrei Grintchenko | Sample message flows, messages descriptions, code sets, revisions from Legal, various edits and formatting |
| 1.5 | 31/7/13 | Andrei Grintchenko | Format and style edits, additional review revision from NFR TF, updated recommended messages list following Steering Group discussion, and messages description wording |
| 1.6 | 01/08/13 | Andrei Grintchenko | Further revisions from DDX SG call and edits |
| 1.7 | 06/08/13 | Andrei Grintchenko | Interline TF feedback - Removed Use Case 3 (Corporate Booking Tool (CBT), Companion with Interline) - out of scope for this version of the document; incorporated FMRR feedback/ comments; various edits |
| 1.71 | 19/08/13 | Andrew May | Added revised versions of Use Cases |
| 1.72 | 19/08/13 | Andrei Grintchenko | Aligned definitions and references |
| 1.73 | 23/08/13 | Andrei Grintchenko | PDF Submission Version |
| 1.74 | 23/08/13 | Andrei Grintchenko | Updated with the corrected version of Use Case 7: Through-Fare Journeys on Interline Marketing Carriers following Interline TF input. PDF version. |
| 1.75 | 27/09/13 | Andrei Grintchenko | Updated following 2nd PADIS Messaging Week as per agreed Outstanding Items List; updated Message Sequence Flow diagrams; typos and numbering corrections; Definitions and Recommended Messages tables alpha sort. |
| 1.78 | 09/10/13 | Andrew May/ Andrei Grintchenko | Appendix D with Shopping Response and Offer ID Scenarios added; Updates following DDXWG Steering Group meeting further addressing agreed PADIS Outstanding Items List. |
| 1.79 | 23/10/13 | PADIS Review Call | FINAL REVISION - Agreed changes produced on site during PADIS Review Call on 23 October 2013. |

# Table of Contents

# 1    Introduction

IATA Resolution 787, passed in Oct 2012, recognised that the industry will benefit from the introduction of a standard process for airlines to distribute product offers created within their own systems and to manage the resulting orders. This standard Application Programming Interface (API) is called the New Distribution Capability (NDC) API.

In February 2013 IATA took over governance of the OpenAxis schema as the basis for this standard. This document covers the business requirements for the shopping part of the NDC process, ie up to the point when the customer is ready to accept a product offer.

The schema received from Open AXIS will be further enhanced to support these business requirements and, following a review and approval by PADIS, published as IATA PADIS standard.

# 2    Scope

## 2.1    Field of Application

The full NDC context is shown in the following diagram with the scope of this BRD indicated.
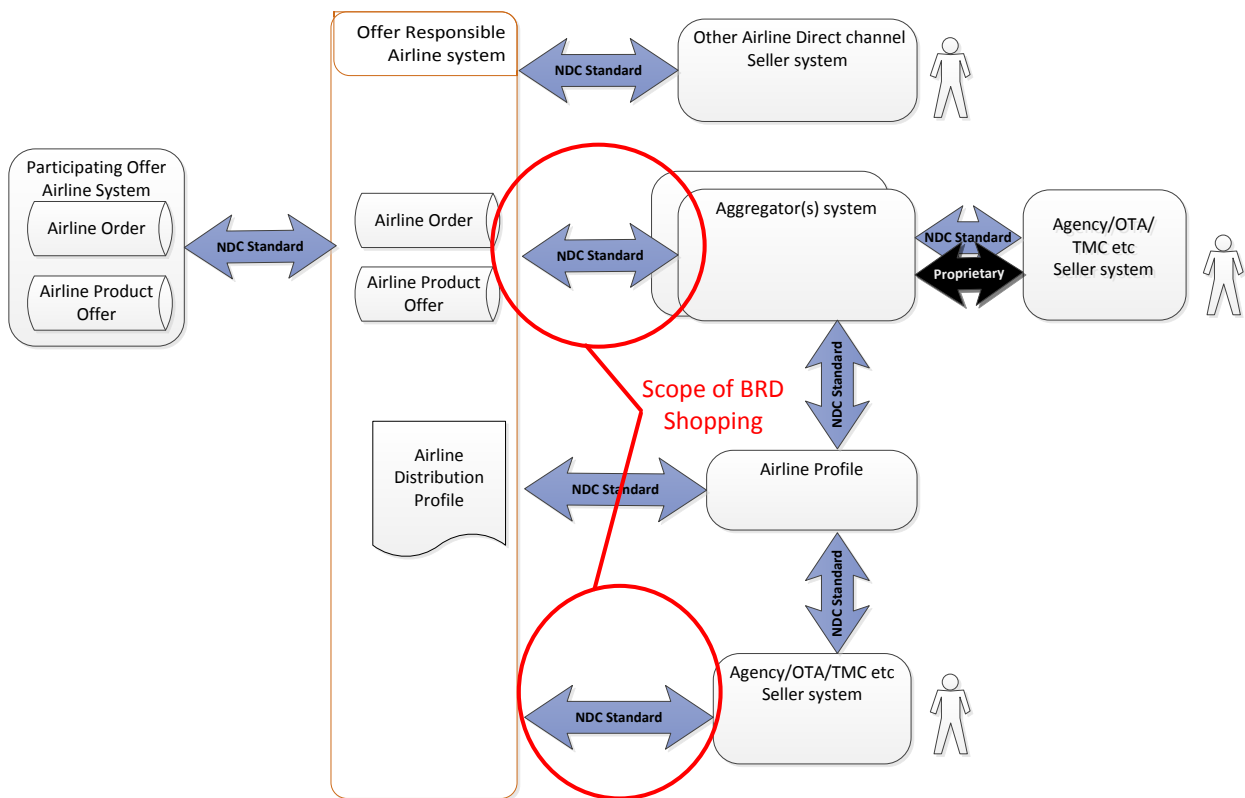


The scope covered by this BRD for NDC Shopping is:

**In Scope:**

- The shopping request passed to Airline(s).
- The product offer response returned from the Airline(s)

## 2.2    Recommended Messages

**Note:** Recommended messages have been updated from the original OpenAxis schema used as the basis in order to meet NDC Airline Shopping business requirements. In consideration of the current industry pilots and OpenAxis users, existing schema functionality has been retained where possible and applicable. As such recommended message functionality may extend beyond the scope defined in this document (for example – Journey Control functionality is beyond the scope of Shopping, and while it was not incorporated in the new AirShopping message pair, it was left in the pre-existing messages).

| AirShopping | *Message Pair: AirShoppingRQ/ AirShoppingRS* |
|---|---|
| | The AirShopping transaction set supports both demanding and flexible shopping experiences for anonymous or personalized shopping. The combination of functionally - rich attribute and affinity shopping support date range or specific month (calendar) shopping as an example. The response returns offers which may include branded offers or itinerary-priced offers with or without ancillary services. |
| | It also returns applicable rules for the integrated offers as well as for each service identified in the offer. |
| | The message returns reference to multi-media content at message level as well as at the individual offer and even service levels identified in the offer. |
| **BaggageAllowance** | *Message Pair: BaggageAllowanceRQ/ BaggageAllowanceRS* |
| | The BaggageAllowance transaction set provides checked and carry-on baggage allowance details. Request qualifiers may include traveler, origin/destination, point of sale, flight-specific and ticketed fare information. |
| | The response returns the baggage allowance, whether or not IATA Resolution 302 or DOT rules are applicable, baggage weight, dimensions and size information by origin/ destination pair. Users may also obtain an additional catalog of applicable embargoes and charges within the same origin and destination pair. |
| **BaggageCharges** | *Message Pair: BaggageChargesRQ/ BaggageChargesRS* |
| | The BaggageCharges transaction set determines and returns the pricing for a set of checked bags. Request qualifiers include traveler, origin/ destination, point of sale, flight-specific and ticketed fare information. |
| | The response returns the baggage charges, whether or not IATA Resolution 302 or DOT rules are applicable, and detailed trip-level pricing for all requested passengers, or origin/ destination level pricing that includes checked and carry-on baggage charges. |
| **BaggageList** | *Message Pair: BaggageListRQ/ BaggageListRS* |
| | The BaggageList transaction set determines and returns a list a list of bag types (e.g. sporting equipment, pet in hold, overweight bags, etc.) that can be checked or brought in cabin for a fee and for a specified itinerary or carrier. |

| | Request qualifiers may include traveler, origin/ destination, flight-specific and ticketed fare information. |
|---|---|
| **FareRules** | *Message Pair: FareRulesRQ/ FareRulesRS*<br><br>The FareRules transaction set returns the filed details of a specific fare basis code (FBC).<br><br>The message supports multi-media content at the message level. Alternatively it may be providing links to web pages that contain optional service Terms and Conditions as an example. |
| **FileRetrieve/ FileList** | *Message Pair: FileRetrieveRQ/ FileListRS*<br><br>The FileRetrieveRQ/FileListRS transaction set supplements other NDC shopping messages with payloads designed to efficiently exchange offer-associated media using IDs and URLs. Using the FileRetrieveRQ message, implementers can request subsequently retrieve binary encoded files—such as images or PDFs—from using the IDs or URLs in a shopping response message. These files are returned in the FileListRS message.<br><br>This message pair also supports scenarios where trading partners maintain a physical cache of offer associated media from other trading partners based on media IDs and/or URLs. |
| **FlightPrice** | *Message Pair: FlightPriceRQ/ FlightPriceRS*<br><br>The FlightPrice transaction set may return two different sets of content. Based on request attributes, the response may initially provide additional à la carte ancillary services that are applicable and available for the selected offer.<br><br>If no ancillary services are available, the message returns a final pricing. If ancillary services are available, the modified pricing request includes selected services and returns a final pricing that includes service(s) selection.<br><br>The response message also returns multi-media content at the message level. |
| **SeatAvailability** | *Message Pair: SeatAvailabilityRQ/ SeatAvailabilityRS*<br><br>The SeatAvailability transaction set returns data on all seats associated with a selected flight. It may indicate which seats are already selected, and which are still available. It also returns data on fees for seats. This data may be used to construct seat maps.<br><br>The message also returns multi-media content at both the message and individual service level. |
| **ServiceList** | *Message Pair: ServiceListRQ/ ServiceListRS*<br><br>The ServiceList transaction set returns a list of all applicable ancillary services that meet request qualifiers and flights. |

| | |
|---|---|
| | The message supports shopping for additional a la carte services to complement any selected offer, as well as shopping for specialty service items not generally included in an initial offer but rather based on service search filters, e.g. sports equipment specialty baggage and unaccompanied minor fees.<br><br>The message also returns multi-media content at both the message and individual service levels identified in the offer. |
| **ServicePrice** | *Message Pair: ServicePriceRQ/ ServicePriceRS*<br><br>The ServicePrice transaction set allows individual seats and/or known à la carte ancillary services to be priced on demand.<br><br>The response message returns pricing of seat/services meeting the request qualifiers.<br><br>The message also returns multi-media content at message level as well as at the individual service level. |

| | |
|---|---|
| **SimpleTypes** | The SimpleTypes schema promotes NDC type reuse as it contains common SimpleTypes, attributes and attribute Groups used in two or more NDC Phase 1 Shopping/ Pricing schema. It is included in the CommonTypes schema file via an xsd: include mechanism. |
| **CommonTypes** | Common definitions, used by the majority of NDC transactions, that provides a common representation of key data sets and promote reuse within the specification. |

Proposed NDC XML schemas as identified in this document are included in the attached Airline_Shopping_Schema.zip file.

Shopping requests may optionally be distributed from, and product responses aggregated by, one or several intermediary hub systems (termed aggregators in this document) or the request distribution and response aggregation may be integrated within the Seller's system.

Types of Seller systems include Agencies (OTA, TMC, Tour Operator, etc.), Corporate Booking Tools, Meta Search sites.

The scope of product offers includes support for branded fares and consists of flight and ancillaries (both bundled and sold separately) supplied by an Airline. It also includes interline and codeshare where interactive NDC messaging with the participating airline is not required because the marketing carrier owns the offer (eg through fares).

Shopping requests may be anonymous (no traveller data) or personalized (traveller consents to provide personal data). In addition to basic shopping requests on route & date, Affinity shopping and Attribute shopping are supported, as follows:

- **Affinity Shopping:** A wide search defining a range of criteria including specific interest, destination attributes and defined budget plus date and destination ranges.
- **Attribute Shopping:** A search specifying one or more attributes to obtain more focused results (eg equipment type, seat types and characteristics, baggage allowance, meals, etc.).

**Out of Scope:**

The remaining proposed standards resulting from the NDC project is out of scope of this document, ie:

- Airline Profile distribution and usage.
- Airline Order lifecycle management from acceptance of the product offer.
- Interactions between the Offer Responsible Airline (ORA) and Participating Offer Airlines (POA) for product offers comprising more than one airline's product.

## 2.3 Principles

- Seller and intermediary credentials will be authenticated by the airline.
- Parties using the API shall ensure their own compliance with all applicable laws and regulations.
- Parties using the API shall be responsible for maintaining data confidentiality and be compliant with all applicable privacy laws and regulations.
- Display orders and results ranking across multiple *Offer Responsible Airlines* are not in scope of NDC.

# 3   References

- IATA Resolution 787
- IATA NDC API Reference Guide https://extranet2.iata.org/sites/ndc-api/ndcapiguidecontent/ndc-api-guide.aspx

# 4   Terms and Definitions

| Affinity Shopping | A wide search defining a range of criteria including specific interest, destination attributes and defined budget plus date and destination ranges. |
|---|---|
| Aggregator | The business function of distributing a Seller's shopping request to multiple Airlines and aggregating the subsequent responses. |
| Airline | Supplies product offers in response to receiving a request from a Seller. Airline refers to itself and any subcontracted entity providing a service to the airline |
| Ancillary Services or Optional Services | Ancillary Services are defined in PSC Resolution 787 as anything outside of product attributes (optional or discounted). Ancillary Services may be bundled in the product offer, or offered as additional, a la cart services. For the purposes of this document the term Ancillary Services is sometimes used interchangeably with the term Optional Services. |
| Anonymous Shopping | No traveller personal data in the shopping request |
| API | Application Programming Interface |
| Attribute Shopping | A search specifying one or more attributes to get more focused results (eg equipment types, Seat types and characteristics, baggage allowance, meals, etc. |
| Authentication | The process by which a system identifies an individual or a business entity to make sure that the user or the business entity is who they claim to be, based on |

| | attributes that are sent in a message. |
|---|---|
| **Booking Time Limit** | *Booking time limit* is the amount of time within which the booking transaction must be completed (does not include ticketing). |
| **CBT** | Corporate Booking Tool |
| **Distribution Channel Provider** | An entity that has the capability to interface with an airline's dynamic shopping API enabling distribution of airline product offers across one or multiple channels. For the purposes of this document it is assumed that such provider shall use industry standard NDC XML messages to communicate with airlines dynamic shopping API, and may act as a content aggregator. |
| **FQTV** | FreQuent TraVeler |
| **Meta Search deep link** | A link to an airline's or OTA's itinerary purchase page enabling the user to purchase a specific itinerary offer. |
| **Meta Search shallow link** | A link to an airline's or OTA's shopping results page listing multiple flight options for a pre-specified city pair and dates, as well as upsell / cross-sell products |
| **OAL** | Other AirLine |
| **Offer ID** | *Offer ID* facilitates the tracking and verification of individually priced offer(s) selected from the shopping response.  Only the *Offer IDs* of the ORA (Offer Responsible Airline)  are returned in shopping responses. *Offer ID* is unique to each individually priced offer in the shopping response even if the offer price is zero. OfferID may be specific to individual passengers in the offer, and may be associated with a segment or a journey. The set of Offer IDs returned in a response are referenced by a Shopping Response ID. See Appendix D for scenarios illustrating use of this identifier. |
| **Offer Time Limit** | *Offer Time Limit* is the amount of time within which offers in a shopping response maybe reserved. Upon expiringa new shopping request must be sent. |
| **ORA** | *Offer Responsible Airline*: The airline responsible for returning a combined offer, including participating airline offers, to the requesting entity |
| **OSI** | Other Service Information |
| **OTA** | Online Travel Agency |
| **Personalised Shopping** | Traveller consents to include personal data in the shopping request |
| **PNR** | Passenger Name Record |
| **POA** | *Participating Offer Airline*: An airline (marketing, operating and/or validating) other than the Offer Responsible Airline involved in a product offer |

| | |
|---|---|
| **Product Bundle** | where several products are offered for sale as one product. |
| **Seller** | Creates shopping requests to Airlines on behalf of a customer and displays the subsequent product responses for review |
| **Shopping** | A process whereby a Seller is able to request offers from the airlines (ie flight and ancillaries) based on its desired search criteria and receive offers corresponding to its request. There are various types of shopping, including, for example, Personalized/ Anonymous and Attribute/ Affinity shopping types as defined in this document. |
| **Shopping Basket** | A Shopping Basket is e-commerce software that allows visitors to an internet site to select items for eventual purchase |
| **Shopping Response ID** | *Shopping Response ID* facilitates the tracking of what was offered and is an identifier unique to the source airline for a set of product offers returned in response to a shopping request.<br><br>*Shopping Response ID* may be comprised of an *Offer ID* corresponding to an individual flight and/or ancillary service product offer that make up the offer. See Appendix D for scenarios illustrating use of this identifier. |
| **SSR** | Special Service Request |
| **Ticket Time Limit** | *Ticket Time Limit* is the amount of time which the booking maybe held until it must be ticketed or other accountable documents issued (eg EMD). |
| **TMC** | Travel Management Company |
| **XML** | eXtensible Markup Language |

# 5 Functional Requirements

## 5.1 Functional Requirement Description

### 5.1.1 Shopping Request

| Ref # | Category | Shopping Request Requirements | |
|---|---|---|---|
| 1.1 | Shopping via an aggregator | Provide capability to allow shopping requests to be made through an aggregator.<br><br>The aggregator will pass individual shopping requests only to airlines that want to receive them (eg from a geographical and other market type perspective) | Enabled through:<br>• AirShoppingRQ |
| 1.2 | Shopping via direct connections | Provide capability to make shopping requests directly from a Seller to airline(s). | Enabled through:<br>• AirShoppingRQ |

| Ref # | Category | Shopping Request Requirements | |
|---|---|---|---|
| 1.3 | Shopping Types | Provide capability to allow Basic, Attribute and Affinity type shopping requests to be made (see below). | Enabled through<br><br>• All inclusive Shopping Requirements are enabled through AirShoppingRQ |
| 1.4 | Basic Shopping Request | Basic Shopping: Request available prices for flights that meet a specified:<br><br>- Origin & Destination and cabin (economy, etc.),<br><br>- specified date or date range (eg for a range of months). The request will optionally include the granularity required in the response, ie lowest offer weekly, monthly, and for specified arrival/departure days weekly or monthly (eg Friday outbound Sunday inbound for each calendar month) and optionally:<br><br>- specified airlines or airline groupings<br><br>- specified product name including co-branded products<br><br>- for a number of pax of specified types (adult, child etc.) including groups (group name and description)<br><br>- return, one way, open jaw and multi city (ie a series of origin & destination sectors that may not necessarily connect, eg A-B, C-D, D-E, E-A)<br><br>- specified flight number<br><br>- within optional departure or arrival time range<br><br>- indicator to show that the product offer will be included in an opaquely priced tour package in order to receive applicable Tour Operator negotiated offers<br><br>- specialist pax type eg seaman, missionary/charity, media, student, etc.<br><br>- discount voucher or promotional codes<br><br>- offer identifiers for products selected from a preceding shopping interaction so that the airline has the opportunity to return offers that are complementary to items already in the customer shopping basket | Enabled through<br><br>• AirShoppingRQ for full requirements on Basic Shopping<br><br>AirShoppingRQ enables the entire set of the Basic Shopping Request requirements.<br><br><br>Discount Shopping (such as Promotion ID, Deal ID, etc.) is supported in the respective Qualifier groups in all Shopping and Pricing Request (RQ) messages |

| Ref # | Category | Shopping Request Requirements | |
|---|---|---|---|
| | | For a list of qualifiers refer to: <br><br> NDC BRD Qualifiers - Supportingv71_OpenAXIS_Rev5.xlsx document | |
| 1.5 | Product Attribute & Ancillary Shopping: | Product Attribute & Ancillary Shopping: additional optional search criteria in basic & affinity shopping where the requested attribute or ancillary is included within the total quoted price to allow comparison between airline responses even though one airline offer may be a product bundle and another a combination of flight & separately chargeable ancillary, for example: <br> - max number of connections, including no connections. <br> - O&D duration <br> - offer conditions, eg flexible or restricted or penalised flight time or date changes allowed <br> - flight cancellation refund conditions <br> - loyalty point earning <br> - specific marketing or operating airline(s), <br> - Max budget (inclusive of taxes & charges) <br> - seat type (eg minimum seat pitch, fully flat horizontal bed) <br> - Inclusive of specified services eg: meals, refreshments, hand baggage, hold baggage, in-flight entertainment, wifi power outlet, etc. <br> - special meal availability <br> - disability support, eg carriage of personal wheelchair, provision of 3rd party wheelchair, oxygen <br> - provision of meet & greet services <br> - equipment type (eg wide body) <br><br> For a list of qualifiers refer to NDC BRD Qualifiers - Supportingv71_OpenAXIS_Rev5.xlsx document | Enabled trough <br><br> • AirShoppingRQ |
| 1.6 | Affinity Shopping | Affinity Shopping: Request available prices for products that meet a specified: origin(s)/region(s) and group of destinations that have an attribute affinity (eg, geographical range (eg radius), holiday type: | Enabled trough <br><br> • AirShoppingRQ |

| Ref # | Category | Shopping Request Requirements | |
|---|---|---|---|
| | | beach, ski, climate temperature, or other special interest, etc.) and optional additional destination filters eg region, country, etc. | |
| 1.7 | Personalised Shopping | Personalised Shopping: optional inclusion in basic, attribute & affinity shopping requests of personal information, for example:<br>- loyalty or affiliate membership scheme(s) and  number(s) and traveller full name(s)<br><br>- corporate identity of traveller(s)'s employer(s)<br><br>- group event identifier<br><br>- customer unique identifier (eg passport or identity card country and number for resident discounts)<br>- other airline defined profile criteria | Personalized Shopping Attributes are contained in the following messages:<br><br>• AirShoppingRQ |
| 1.8 | Response Preferences | Optional inclusion in the shopping request of response message preferences: eg<br>- published and / or private fares only<br><br>- Inclusion of waitlisted offers<br><br>- Maximum number of stops to meet O&D request<br>- max number of offers to return<br>- max number of days to return<br>- preferred language for content response<br><br>- Preferred currency of offer | Globally supported in applicable Request (RQ) messages:<br><br>• FlightPriceRQ<br><br>• AirShoppingRQ |

| Ref # | Category | Shopping Request Requirements | |
|---|---|---|---|
| 1.9 | Offer Rules | Offer Rules: Request offer rules for a specified product in order to request detailed rules where the offer response may have only included a summary | Supported by default in responses to all respective Request (RQ) messages.<br><br>• FlightPriceRQ<br><br>• AirShoppingRQ<br><br>• ServiceListRQ<br><br>• ServicePriceRQ<br><br>• SeatAvailabilityRQ<br><br><br>In addition, the requirement is supported by the dedicated FareRulesRQ, which will return traditional fare rules in its response |
| 1.10 | Redemption Shopping | Optional inclusion in basic, attribute or affinity shopping requests for a redemption product quoted in loyalty currency. In addition optionally request a loyalty to currency conversion rate to allow mixed loyalty and cash price to be quoted. Loyalty or affiliate membership scheme(s), & number(s) would be specified. | Enabled through<br><br>• FlightPriceRQ<br><br>• AirShoppingRQ<br><br>• ServiceListRQ<br><br>• ServicePriceRQ<br><br>• SeatAvailabilityRQ |
| 1.11 | Ancillary Product List | Ancillary Product List: request a list of chargeable and free of charge ancillary products and services available for a specified flight or route, cabin & personalised for price and eligibility for any personalised data included (see Personalised Shopping).  Include offer identifier as a link to existing flight & ancillary offers. | Enabled through<br><br>• ServiceListRQ<br><br>• FlightPriceRQ |
| 1.12 | Bag Allowance and charges | Baggage Shopping: Request checked and cabin bag allowance for:<br>- a specified flight or route & cabin,<br>- include offer identifier  for existing flight & ancillary offers - personalised for price and eligibility for any personal data included.<br><br>- List of applicable checked and carry-on baggage—for a specified itinerary or carrier that—that be subject to a charge, e.g. sporting equipment, pet in hold, overweight bags, etc. | Enabled through<br><br>• BaggageAllowanceRQ<br><br>• BaggageChargesRQ<br><br>• BaggageListRQ |

| Ref # | Category | Shopping Request Requirements | |
|---|---|---|---|
| 1.13 | Seating | Seat Selection: Request seat map with prices if applicable  by:<br>- seat type (exit row, upper deck, etc.)<br>- for a specified flight or route & cabin,<br>- offer identifier (if applicable) for existing flight & ancillary offers- personalised for price and eligibility for any personal data included | Enabled through<br>• SeatAvailabilityRQ<br>• ServiceListRQ<br>Dedicated support for pricing or re-pricing of a known seat(s) is enabled by<br>• ServicePriceRQ |
| 1.14 | Other Ancillary Shopping | Shopping request for Ancillaries: request prices by:<br>- ancillary type: (eg excess/heavy bags, meals, wifi, lounge, insurance, priority boarding, etc)<br>- for a specified flight or route & cabin<br>- offer identifier (for existing flight & ancillary offers<br>- personalised for price and eligibility for any personal data included. | Enabled through<br>• FlightPriceRQ<br>• ServiceListRQ<br>• SeatAvailabilityRQ<br>Dedicated support for pricing and re-pricing of known services is enabled by<br>• ServicePriceRQ |
| 1.15 | Shopping Basket | The Seller should be able to indicate to the Offer Responsible Airline the offer IDs already in the customer's shopping basket for that Offer Responsible Airline  when making further requests. | Shopping basket tracking may be enabled with unique offer reference keys supported in:<br>• FlightPriceRS<br>• ServiceListRS<br>• ServicePriceRS<br>• SeatAvailabilityRS |

### 5.1.2    Shopping Request Requirements Excluded

| Category | Shopping Request Requirements | Reason for Exclusion |
|---|---|---|
| Post Fulfilment Re-shopping | Re-shopping: shopping request to change a fulfilled (eg ticketed) but undelivered product. Request to include the identity of the existing accountable document (EMD, ticket, etc.) or a reference to it (eg booking reference, offer identity) to allow calculation of the exchange value in the response in addition to the standard shopping request data. | Post booking - so not  in scope for Shopping |
| Schedule | Request schedule data for an origin and destination & date or date range. | Not in scope of NDC |
| Flight Information | Request scheduled flight arrival & departure times, terminals, equipment type, etc. | Not in scope of NDC |

| Category | Shopping Request Requirements | Reason for Exclusion |
|---|---|---|
| Journey Context Shopping | Journey Context Shopping: itinerary request to fit into a specified preceding and/or succeeding itinerary, (eg for a side trip that may fit within a promotional mileage allowance) by including an existing booking reference, if this is an airline specific request, or by including the journey data itself. | Post booking - so not in scope for Shopping |
| Hold Inventory | Hold Inventory: Request space(s) on a specified flight & cabin's inventory to be temporarily held without pax names (eg prior to it being converted into a booking or allowed to lapse). | Not in Shopping scope – see 5.1.4 Shopping Response Exclusions |

### 5.1.3    Shopping Response

| Ref | Category | Shopping Response Requirements | |
|---|---|---|---|
| 2.1 | Shopping Response | The response to all types of shopping requests will include the following:<br><br>- Product responses for dates either side and other than those requested may be returned unless qualified by the Seller request.<br><br>- Multiple product offers in addition to those meeting the request may be returned.<br><br>- The response will indicate the granularity of the response (eg weekly or monthly) and the arrival/departure days specified.<br><br>For each individual O&D , date & product offer returned to the Seller:<br><br>- airline's unique offer identifier, offer time limit,  booking time limit and ticket time limit<br><br>- the applicable date range (eg 'March2013, '4-11 March2013')<br><br>- product name, airline product or service identifier, type of offer(including a group offer), allowable and non-allowable combinability with other products offers conditions of resale (eg max/min price where regulations allow). For a product bundle comprising more than one component product or service (eg a bundle of different ancillaries), each of | Enabled through<br><br>- AirShoppingRS<br><br>- FlightPriceRS<br><br>- SeatAvailabilityRS<br><br><br>Media content can be returned directly within the above messages, or separately retrieved based on media IDs, returned in the above listed messages by using<br><br>- FileRetrieveRQ/ FileListRS |

| Ref | Category | Shopping Response Requirements | |
|---|---|---|---|
| | | these components will be referenced by their airline product or service identifier | |
| | | - optional private offer eligibility rules applied (eg account codes, etc.) | |
| | | - optional discount eligibility rules applied, loyalty scheme points applicable | |
| | | - origin & destination airports, number of stopovers, total journey duration including stopovers | |
| | | - optional promotional material including product announcements | |
| | | - for each connecting segment: | |
| | | - product name, type of offer, | |
| | | - marketing & operating carrier flight numbers and class codes, equipment type, cabin, class of service, segment status (including waitlist) and the validating carrier. | |
| | | - arrival & departure times, flight duration, airport & terminal pairs, minimum connection time (some customers may prefer to select a longer connection) | |
| | | - meal services, bag allowance & other product attributes in preferred language, product attribute display priority ranking (as airlines may want to promote different aspects of their product) and links to product content media | |
| | | - All offer data required under consumer regulations (see below) | |
| | | For a current list of qualifiers refer to NDC BRD Qualifiers - Supportingv71_OpenAXIS_Rev5.xlsx document | |
| 2.2 | Consumer Regulations | The schema must enable the Seller to provide the following types of information regarding the Offer to the Consumer necessary to comply with applicable rules and regulation: | |
| | | Total Offer Price: Consumers must | |

| Ref | Category | Shopping Response Requirements | |
|-----|----------|-------------------------------|---|
| | | present pricing that represents the final price to be paid including applicable taxes, charges, surcharges and fees that are in effect or foreseeable at the time of advertisement/offer.<br><br>Taxes, Surcharges, and Fees Detail: Additional information regarding fees that are included in the Total Offer Price may be required including more detailed description or information.<br><br>Offer Rules and Conditions: Conditions that apply to the offer such as sale dates, travel dates, penalties for changes and others conditions.<br><br>Baggage Charges: Regulations require information specific to Baggage Allowances and Charges.<br><br>Ancillary services: Consumers must be presented information regarding Ancillary services, the total price of those services and what is included in these services.<br><br>Operational Information: Consumers must have information regarding Operating Carriers and in some cases environmental impacts such as $CO_2$ and fuel costs.<br><br>Not all information is required in all circumstances.  See Airline Shopping Schema vs. BRD_Qualifiers_Gap_Analysis.xls. | |
| 2.3 | Attribute Shopping | In addition to the Shopping Response return the Attribute shopping request criteria. Identify each solution as being (a) either a 100% match or (b) a partial match (allow for matching percentage value). | Supported in<br><br>• AirShoppingRS<br><br>(by echoing request data and marking each offer) |
| 2.4 | Personalised Shopping | In addition to the Shopping Response indicate the offer eligibility criteria met from any personalised data provided. | Enabled through<br><br>• ServicePriceCalculation<br><br>• FarePriceCalculation<br><br>elements present in:<br><br>• ServiceListRS |

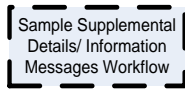| Ref | Category | Shopping Response Requirements | |
|---|---|---|---|
| | | | • FlightPriceRS<br>• AirShoppingRS<br>• SeatAvailabilityRS |
| 2.5 | Affinity Shopping | In addition to the Shopping Response return the Affinity shopping request values. Identify each solution as being (a) either a 100% match or (b) a partial match (allow for matching percentage value). | Supported in<br>• AirShoppingRS<br>(by echoing request data and marking each offer) |
| 2.6 | Offer Rules | Respond with the detailed offer rules applicable to the requested product. | Returned by default in the following responses to the respective requests:<br>• FlightPriceRS<br>• AirShoppingRS<br>• ServiceListRS<br>• SeatAvailabilityRS |
| 2.7 | Ancillary Product List | For the specified flight or route & cabin, list all available optional chargeable and free of charge ancillary products and services, in the preferred language if specified. Indicate eligibility criteria met from any personalised data provided. Each item to include:<br>- product title, description, links to media<br>- product priority of ranking in displays<br>- An indication that an ancillary is under inventory control and requires an availability request<br>- optional promotional material including product announcements | Fully supported in response to the respective requests as follows:<br>• ServiceListRS<br>• FlightPriceRS<br><br>Media content can be returned directly within the above messages, or separately retrieved based on media IDs, returned in the above listed messages by using<br>FileRetrieveRQ/ FileListRS |
| 2.8 | Bag Allowance and Charges | Checked and cabin Baggage allowance applicable to the route, cabin, and offer identifier<br>- any additional allowance derived from personalised data in the request.<br>- any discounts for baggage charges met from existing flight and/or ancillaries in the associated offer.<br>Provide piece, weight, dimensions, etc. | Supported in response to the respective requests as follows:<br>• BaggageAllowanceRS<br>• BaggageChargesRS |

| Ref | Category | Shopping Response Requirements | |
|---|---|---|---|
| 2.9 | Seating | For the specified route or flight & cabin, and offer identifier, respond with:<br>- a seat map showing available seats to select and/or purchase,<br>- seat type (eg exit row), description and price<br>- refund and change conditions<br>- optional links to product media<br>- Include eligibility criteria met from any personalised data provided<br>- include any discounts met in combination with existing flight and/or ancillaries in the offer | Supported in response to the respective requests as follows:<br>• SeatAvailabilityRS<br>• ServiceListRS<br>Dedicated support for pricing or re-pricing of a known seat(s) is enabled by<br>• ServicePriceRQ |
| 2.10 | Other Ancillary Shopping | For the ancillary type(s) requested & for the flight or route & cabin, and offer identifier, & in the preferred language if specified, respond with:<br>- product title, description, links to media<br>- price, refund and change conditions or that the ancillary is unavailable (if under inventory control)<br>- optional promotional material including product announcements<br>- Include eligibility criteria met from any personalised data provided<br>- include any discounts met in combination with existing flight and/or ancillaries in the associated offer | Supported by:<br>• ServiceListRS<br>• SeatAvailabilityRS<br><br>Media content can be returned directly within the above messages, or separately retrieved based on media IDs, returned in the above listed messages by using<br>FileRetrieveRQ/ FileListRS |

### 5.1.4   Shopping Response Requirements Excluded

| Category | Shopping Response Requirements | Reason for Exclusion |
|---|---|---|
| Re-shopping | In addition to the Shopping Response, a Re-shopping response will provide a value for the exchanged product(s) and the basis for the value calculation (ie original base offer, surcharges, taxes and fees less any change penalties). | Post booking - so not in scope for Shopping |
| Schedule | Respond with timetable and associated schedule data. | Not in scope of NDC |
| Held Inventory | Respond with the itinerary held, the segment status, the hold expiry time & the airline's reference to the held inventory (may be the same as an 'offer identifier', see Shopping Response) in order to maintain state. | Post Booking – not in Shopping scope: |

## 5.2   Message Sequence Flows

Message Sequence Flow Legend:

Sample Shopping Messages Workflow

Sample Supplemental Details/ Information Messages Workflow

**NOTE**: Message Sequence Flow diagrams are provided for illustration purposes only. These diagrams are not intended to recommend any particular business process workflow and do not cover all possible scenarios and workflows as there can be an infinite number of possible constructions. Workflows will depend on the business process users will implement, and may be different from one implementation to another. Message pairs are atomic.

### 5.2.1 Basic Shopping with Ancillaries and Additional Baggage Request – Scenario A
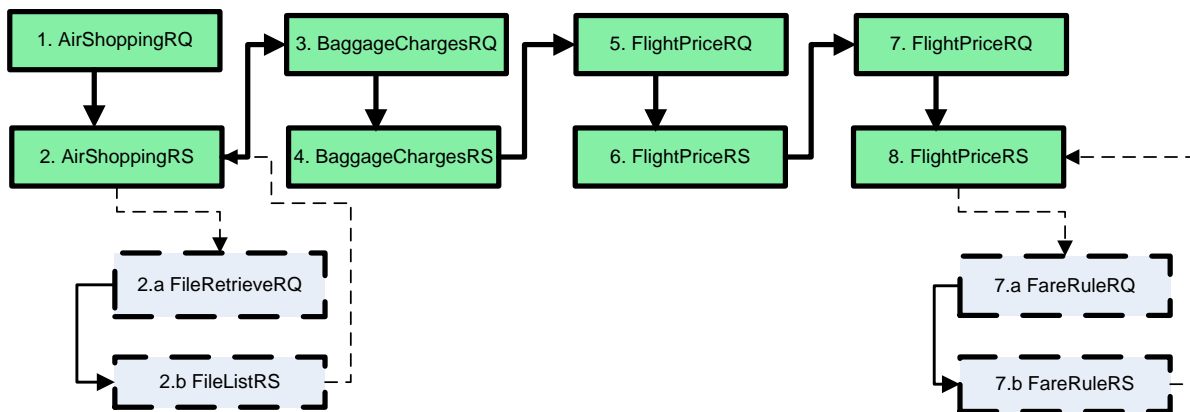


1. Seller creates a basic shopping request and passes it on to an airline(s) using *AirShoppingRQ*
2. Airline receives the requests and responds with the product offer using *AirShoppingRS*
   a. Seller requests rich-content retrieval (ie by Image ID provided in the *AirShoppingRS*) with *FileRetrieveRQ*
   b. Airline responds with the requested media content with *FileListRS*
3. Seller requests additional baggage offer with *BaggageChargesRQ*
4. Airline responds with charges for additional baggage allowance *BaggageChargesRS*
5. Seller displays the product offer and requests additional (ancillary) services available on requested itinerary with *FlightPriceRQ*
6. Airline responds by providing additional (ancillary) services available with *FlightPriceRS*
7. Seller displays the results, and requests to re-price the offer, based on the ancillary services added to the itinerary with *FlightPriceRQ*
   a. Seller request the details of the rules applicable to the offer with *FareRulesRQ*
   b. Airline responds with the details of the offer with *FareRulesRQ*
8. Airline responds with re-prices offer based on the ancillary services added to the itinerary with *FlightPriceRS*

### 5.2.2 Attribute Shopping with no Aggregation and Paid Seating Request – Scenario B
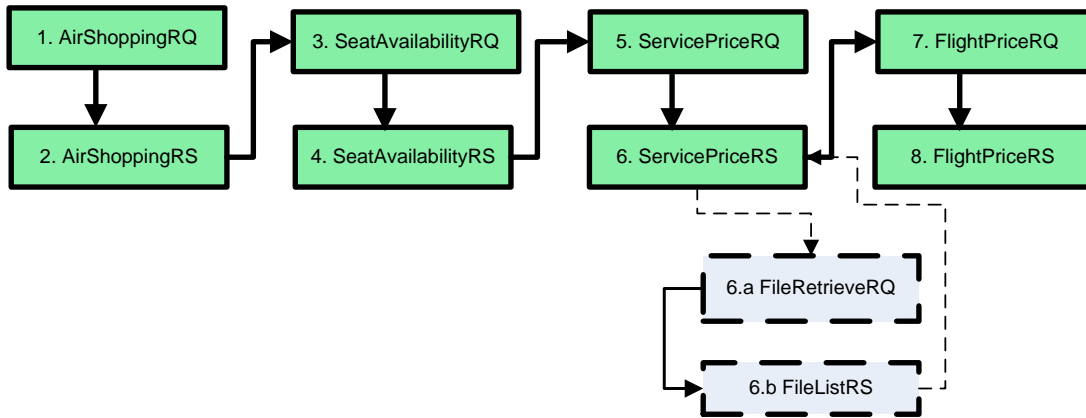


1. Seller creates an attribute shopping request (ie including Max. travel budget, in addition to O&D) and passes it on to an airline(s) using *AirShoppingRQ*
2. Airline receives the requests and responds with the product offer using *AirShoppingRS*
3. Seller requests to view seat availability with *SeatAvailabilityRQ*
4. Airline responds with seat availability with *SeatAvailabilityRS*
5. Seller request pricing for a specified seat with *ServicePriceRQ*
6. Airline responds with a price for the specified seat with *ServicePriceRS*
    a. Seller requests rich-content retrieval (eg. selected seat picture, by Image ID provided in the *AirShoppingRS*) with *FileRetrieveRQ*
    b. Airline responds with the requested media content with *FileListRS*
7. Seller displays the results, and requests to re-price the offer, inclusive of specified paid seating with *FlightPriceRQ*
8. Airline responds with re-prices offer with *FlightPriceRS*

### 5.2.3 Personalized Attribute Shopping with no Aggregation and Additional Baggage Allowance and Special Meal Request – Scenario C
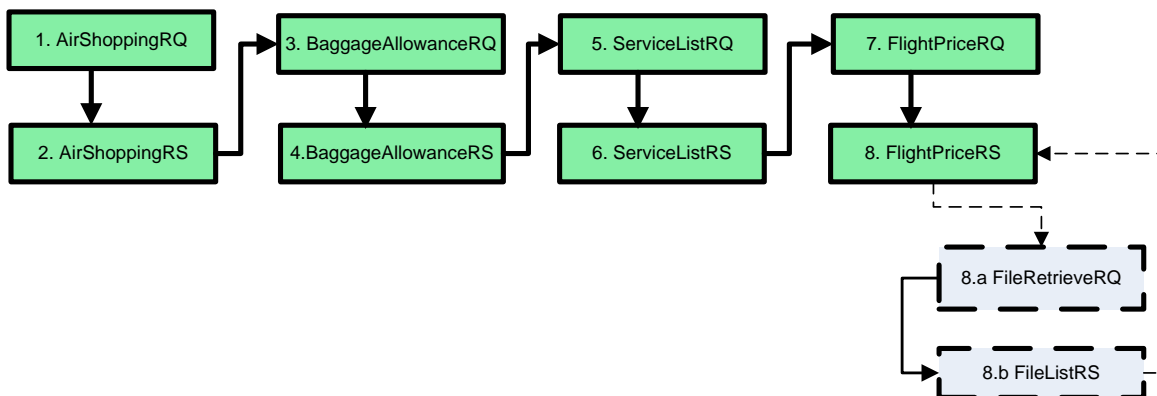


1. Seller creates an anonymous attribute shopping request (ie including Max. travel budget, in addition to O&D) and passes it on to an airline(s) using *AirShoppingRQ*
2. Airline receives the requests and responds with the product offer using *AirShoppingRS*

3. Seller requests to provide updated baggage allowance information based on traveler personal information using **BaggageAllowanceRQ**
4. Airline responds with updated baggage allowance the traveler is entitled to with **BaggageAllowanceRS**
5. Seller requests the availability of special meals on the selected itinerary using **ServiceListRQ**
6. Airline responds with a list of available special meals options using **ServiceListRS**
7. Seller request to re-price the offer inclusive of additional baggage allowance based on the traveler information and selected special meal option using **FlightPriceRS**
8. Airline responds with the re-prices offer using **FlightPriceRS**
   a. Seller requests rich content retrieval (special meal picture) with **FileRetrieveRQ**
   b. Airline responds with the requested rich content using **FileListRS**

### 5.2.4 Attribute Shopping with Aggregation and Special Meal Request – Scenario D
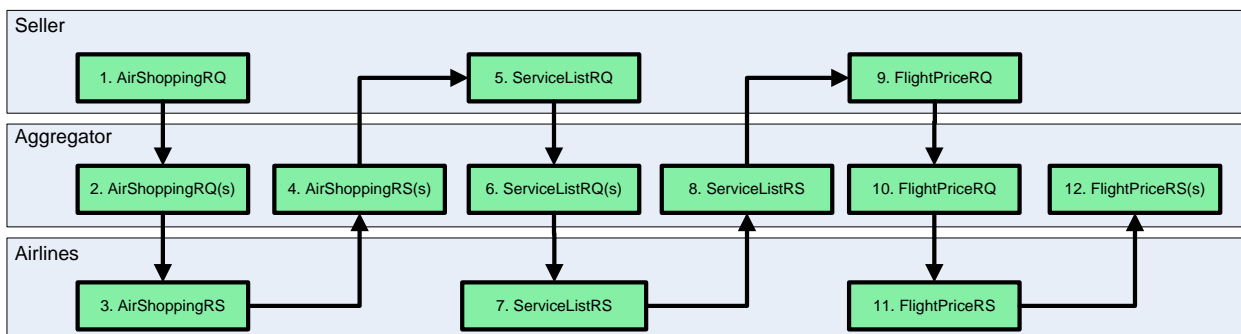


When using an Aggregator the same set of messages, as previous examples in this Section will be used, and the Aggregator will be collecting and passing messages between the Seller and the Airlines without alternation.

1. Seller creates an attribute shopping request (ie including Max. travel budget, in addition to O&D) and passes it on to an Aggregator using **AirShoppingRQ**
2. Aggregator passes the request to the Airlines that support the requirements using the same **AirShoppingRQ**
3. Airlines receive the requests and respond with the product offer using **AirShoppingRS**
4. Aggregator collects and aggregates the responses and passes them to the Seller using **AirShoppingRS**
5. Seller requests the availability of special meals on the selected itinerary and passes it on to the aggregator using **ServiceListRQ**
6. Aggregator passes the request to the Airlines that support the requirement using the same **ServiceListRQ**
7. Airlines respond with a list of available special meals options using **ServiceListRS**
8. Aggregator collects and aggregates the responses and passes them to the Seller using the same **ServiceListRS**
9. Seller request to re-price the offer inclusive of additional selected special meal option using **FlightPriceRQ**
10. Aggregator passes the request to the Airlines using the same **FlightPriceRQ**
11. Airlines respond with the re-prices offers using **FlightPriceRS**

12. Aggregator collects and aggregates the responses and passes them on to the Seller using the same *FlightPriceRS*

# 6   Data Description

Data element descriptions, schema requirements for shopping and gaps closure with the existing schema were produced on the basis *NDC BRD Qualifiers - Supporting v71_Gap_Analysis vs OpenAXIS_Rev5.xls* originally completed by DDXWG Tactical stream. Details can be found in the attached documents, and recommended schemas:

- Airline_Shopping_Schema.zip
- Airline_Shopping_Schema_Release_Notes.pdf
- Airline Shopping Schema vs. BRD_Qualifiers_Gap_Analysis.xls
- NDC_BRD_Shopping_BRD_QualifiersSupporting_v71_Gap_Analysis_vs_OpenAXIS_Rev5

# 7   Message Models

OpenAxis XML schema (March 2013) have been used as the basis for NDC XML capability. As a direct consequence of this, existing message models were adopted. Please refer to the attached *Airline_Shopping_Schema.zip* containing messages in scope.

Shopping and Pricing messages have been updated to meet the requirements identified as gaps in *NDC BRD_Shopping_Qualifiers_Supporting_v71_Gap_Analysis_vs_OpenAXIS_Rev5.xls*. Additional work on updating the design and architecture was also carried out. Summary of changes can be found in *Airline_Shopping_Schema_Release_Notes.pdf.*

# 8  Non-Functional Requirements

| Feature | Definition | Requirement Shopping |
|---|---|---|
| **Standard based and interoperable messaging protocol** | Messaging protocol must be based on industry standards to enable interoperability | Applicable |
| **Send Only** | Also called Push MEP is simple one-way messaging where a message is sent with no expectation of a response. | n/a |
| **Receive only** | Also called Pull MEP is a message pattern where a non-addressable sender supports the ability to explicitly obtain messages from another application. This can be used for exchanges that are of "pull" type only | n/a |
| **Request/Response exchange** | Message pattern consists of one or more request/response pairs. The correlation between a request and a response is well defined. In this MEP the response maybe deferred and the requesting application may or may not block application processing until a response is received | Applicable |
| **Diagnostics/Routing** | Authentication, diagnostic, logging & routing information should be included in the message header and not the payload | Applicable |
| **Reliability** | Protocol capability to support assured and single delivery to the receiving application with no message loss | Applicable |
| **Message acknowledgement/ delivery report** | Message exchange protocol acknowledgement provides guaranteed delivery in a sense that if there is any communication failure or any remote system unavailability, the message is transparently repeated until the application has received it. This is referred to as reliability feature necessary for business critical messages. Message loss may happen using application acknowledgement only in cases like application or system problems. It may however be complementary to reliability mechanism. Additionally there is also a notion of end to end delivery report that can be used to request a delivery notification form the end user generated by its messaging agent. This may be used for cases that a proof of delivery is required by the sender. | n/a |

| Feature | Definition | Requirement Shopping |
|---|---|---|
| **Fault management** | Capability to report permanent or transient problems or errors in message exchange and return this information to the sending application | Applicable |
| **Priority handling** | Capability to assign priority to messages and process accordingly – separate between processing and delivery related priority handling. | Applicable |
| **Data confidentiality** | Assurance that data remain secret except for those entities that have been authorized to access this data. (i.e. encryption/decryption). Identify any data elements that are subject to specific confidentiality requirements. For example payment card data or personal data may be subject to PCI compliance requirements. | Applicable to passenger personal data |
| **Requester Authentication** | Capability to confirm the identity claimed by a sender or entity | Supported in all Request messages. To include the identity of the source of the request (the identity of the selling entity, the staff member making the request and the Point of Sale channel ) and any intermediaries that the request has passed through. |
| **Message integrity** | Capability to ensure that data are preserved in its original form and not altered | Applicable to the message body |
| **Capability to target multiple recipients** | Ability to send a message to more than one recipient or applications | Applicable, eg to multiple directly connected airlines plus one or more aggregators |

| Feature | Definition | Requirement Shopping |
|---|---|---|
| Multi part Messages | Communications do not support the transmission of messages in multiple parts. | Applicable |
| Support for attachment (for rich documents (image, large files etc.) | Ability to have digital attachments (to allow simpler management of attachments and optimized transport) | Attachments must not appear in the message – only links to them |
| Message Compression | Capability to compress (to save bandwidth) | Applicable |
| Support for specific protocols | Please indicate what messaging protocols you expect the industry will use to exchange the messages. | May need to support either or both SOAP and REST |
| Response Time | Communications must support a timeout function | Applicable |
| Versioning | Messages must comply with PADIS versioning specifications | Applicable |
| Localisation | Any localisation data elements must support the ability to provide a language identifier | Applicable |
| Unique Message Identification | Messages should provide the ability to support a unique message identifier | Applicable |
| State | Messages should have the ability to support both stateful and stateless modes of communication | Shopping messages will be stateless |
| Message Expiration | Communications should provide the ability to stipulate an expiration timestamp | Applicable |
| Schema Language Locale | Message schema must be written in en_us | Applicable |

# 9    Code Lists

PADIS Codesets must be used where existing and where possible. DDXWG is responsible for requesting PADIS to update and/ or add codesets as NDC business needs may evolve. Codesets are managed according to PADIS methodology and governance process.

Please refer to NDC Airline Shopping Schema Release Notes for codesets identification.

## Appendix A: List of Use Cases

The range of use cases included are not exhaustive. Use cases described are illustrations. Personalized shopping scenarios are included to demonstrate the capabilities described in the business requirements. Personalization is optional, and the level of personalization depends on the traveller choice.

| ID | Name | Seller | Aggregator | Passenger | Shopping |
|----|------|--------|------------|-----------|----------|
| 0 | Generic Shopping Use Cases | Generic | Direct & /or Distribution channel provider | Anonymous or Personalised | Flight + ancillary |
| 1 | Shopping via TMC | TMC | Distribution channel provider | Personalised | Flight + seat |
| 2 | OTA with aggregated and direct connect using shopping basket | OTA | Distribution channel provider & OTA | Personalised | Flight + ancillary |
| 3 | Corporate Booking Tool | CBT | Corporate | Personalised | Flight + ancillary |
| 4 | Meta Search Engine shopping with Attribute Shopping | MSE | MSE, Distribution channel provider & OTA | Personalised | Flight + Baggage Attribute |
| 5 | Leisure Travel Agency with Anonymous Affinity Shopping | Travel Shop/Call Centre | Distribution channel provider | Anonymous | Affinity, Flight + ancillary |
| 6 | Tour Operator building Dynamic Package | Online Tour Operator | Distribution channel provider & Tour Op | Anonymous | Dynamic Package |
| 7 | Through Fare Journeys on Interline Marketing Carriers | Generic | Generic | Anonymous | Through Fares |

# Use Case 0: Generic Shopping Use Cases

**1: Use Case Flow Overview**

The following flow chart shows the interactions of the Use Cases, including optional steps and Branch Cases. Note: The process by which an Aggregator or a Seller access Airlines for Offers is essentially the same. However, the complexity of the Steps 3 and 10 may vary based on the number of airlines and/or aggregators being accessed.
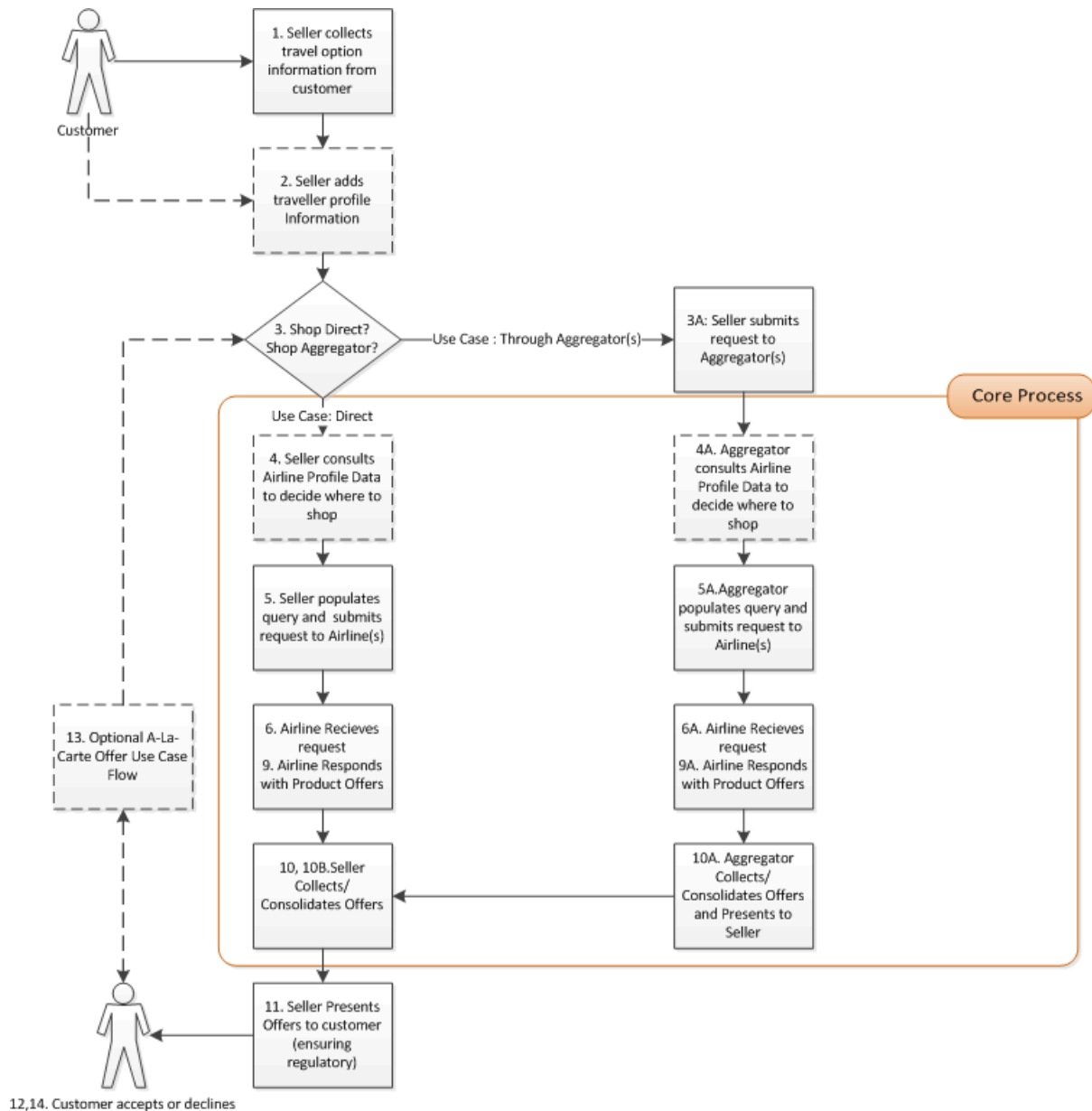
## 2: Use Case Common Characteristics

**Principal actors (with roles):**

**Seller** – Gathers the search parameters for query, submits to Aggregator and presents Offers to Traveller (examples: Travel Management Company, Corporate Booking Tool, Leisure Agency)

**Aggregator** – Receives query from Seller, queries multiple airlines for offers and returns aggregated offers to Seller (Example: Distribution channel provider)

**Airlines** – Responds to requests for offers

**Preconditions/Assumptions:**

Assumption: Responses will include offers with: Bundled Fares, Unbundled Fares, as well as A-La-Carte Ancillary services.

Assumption: Seller has all information required for personalization.

Precondition: Travellers have indicated to the Seller (and provided or withheld consent for) what personalized information and preferences can be used and exchanged with industry providers in the process of Shopping for and Booking/Servicing travel products and services.

[ ] Brackets indicate Optional Step or information from additional Use Case

**Post Conditions:**

- Seller has offers
- No airlines provided Offers

## 3: Shopping Use Case: Direct

**Description:**

Seller Direct Connects to Airline to shop for Product Offers.  Responses will include any or all of: Bundled Product Offers, Unbundled Product Offers, as well as A-La-Carte Optional Services.

This Use Case refers to Personalized Shopping as Optional Steps or Optional Branch Use Cases.

Note this Use Case could be used as a "Base" Use Case, since the other two Use Cases present only minor variations to this case:

- Use Case: Shopping through Aggregator - Aggregator takes on primary role in shopping process
- Use Case: Shopping Direct and through Aggregator - both Seller and Aggregator are simultaneously shopping.  Seller must aggregate responses from both its own Direct Connection and the Aggregator's responses.

**Steps to follow in the process:**

1. The Seller collects travel option information from the customer
2. [Optional Step: Personalized Request - Seller retrieves any existing customer profile information or collects directly from the customer]
3. Seller accesses its Direct Connect  to Airline(s)
4. The Seller consults the Airline Profiles to decide which airlines should receive request
5. The  Seller populates search criteria from user-provided information [and optional personalization data], and submits the request to the Airline(s) with criteria on type of request
6. Airlines receive and process the request

7. Airlines respond to Seller with Offers including any or all of the following types of products:
   - Bundled Product Offers (Fares with or without a-la-carte Optional Services)
   - Unbundled Product Offers (with or without a-la-carte Optional Services)
   - "A-la-carte" Optional Services
8. Seller collects/consolidates Offers from Airline(s)
9. Seller presents offers to customer, ensuring that all required regulatory information is included and presents the offers for selection
10. Customer selects or declines offers, **If no offers are selected, the flow ends**
11. [If an offer is selected, Seller may offer additional A-La-Carte Ancillary Services. Dependent on the results provided in Step 7, the Seller may or may not need to repeat previous steps in order to get more Optional Services]
12. Customer selects or declines A-La-Carte Ancillary Service Offers, **If no offers are selected the flow ends**

## 4: Shopping Use Case: Through an Aggregator

**Description:**

Seller uses an Aggregator to shop for itineraries. Responses will include any or all of: Bundled Product Offers, Unbundled Product Offers, as well as A-La-Carte Ancillary services.

This Use Case refers to ancillary steps for personalized shopping and Interline.

**Steps to follow in the process:**

1-2: Refer to [Use Case: Direct Steps 1-2 ]

3A: The Seller populates search criteria from user-provided information [and ancillary personalization data], and submits the request to the Aggregator with criteria on type of request
4A: The Aggregator consults the Airline Profiles to decide which airlines should receive request
5A: Aggregator sends request to appropriate Airlines with all relevant information [including ancillary personalization information] that should be included within each request
6A: Airlines receive and process the request
7A: Airlines respond to Aggregator with Offers including any or all of the following types of products:

   - Bundled Product Offers (with or without a-la-carte Ancillary services)
   - Unbundled fare offers (with or without a-la-carte Ancillary services)
   - [A-la-carte Ancillary services]

8A: Aggregator consolidates Offers into shopping response and returns shopping response to Seller

9 – 12: Refer to [Use Case: Direct Steps 9-12 ]

## 5: Shopping Use Case: Direct AND through Aggregator
**Description:**

Seller shops for offers using Direct Connects to Airline(s) as well as connecting through an Aggregator. Responses will include any or all of: Bundled Product Offers, Unbundled Product Offers, as well as A-La-Carte Ancillary Services.

## Steps to follow in the process:

1-2: Refer to [Use Case: Direct Steps 1-2 ]
3 – 7: Refer to the following:

[Use Case: Direct Steps 3 – 7]

[Use Case: Shopping through Aggregator Steps 3A – 7A]

8.   Seller consolidates offers from Airlines

8A. Aggregator consolidates offers from Airlines

8B. Sellers consolidates Offers from 10 and 10A

9 – 12: Refer to [Use Case: Direct Steps 9-12 ]

## Use Case 1: Shopping via TMC

**Description:**

Two travellers (1 Top Tier FF and a VGML request) shopping via a TMC who is using a distribution channel provider as an Aggregator, looking for a Round-Trip International itinerary with a non-stop outbound and a stop-over on the return flight. The shopping request will include personalized information and the customers would like to review available seats prior to selecting a solution.

**Principal actors (with roles):**

TMC – (Seller)

distribution channel provider – (Aggregator)

Airlines – (Provider)

**Preconditions/Assumptions:**

TMC will send the request to the Aggregator whom will pass the request to one or more airlines based on the Airline Profiles.  The responses could  include Bundled Fares, Unbundled Fares, as well as Bolt-on (à la carte) items.

The travellers have indicated to the TMC (and provided consent for) what personalized information and preferences can be used and exchanged with industry providers in the process of Shopping for and Booking/Servicing travel products and services.

**Steps to follow in the process:**

1. The TMC collects information from the travelers and retrieves any existing traveler profile(s) from the distribution channel provider or its own system.
2. The TMC then populates search criteria from user-provided information and profile data and submits the request to the distribution channel provider.
3. The distribution channel provider consults the Airline Profiles to decide to which airlines the TMC's request should be sent, along with the relevant information that should be included within each request (i.e. frequent flyer information that is allowed to be shared with each airline). The distribution channel provider then builds and sends the request to each appropriate airline.
4. Airlines receive and process the request from the distribution channel provider.  For example, three airlines receive the request and respond as follows:
    o Airline A returns a set of bundled fare offers along with seat maps for the offers
    o Airline B returns a set of unbundled fare offers
    o Airline C returns a set of unbundled fare offers with a la cart ancillary services
5. The distribution channel provider aggregates and returns all offers to the TMC
6. The TMC presents the offers to the travelers for selection
7. If no offers are selected, the flow ends
8. The TMC sends the selected offer to the distribution channel provider
9. The distribution channel provider sends the selected offer (including any a la carte ancillary services) to the offering airline
10. The selected airline records the selection of the offer and responds with acknowledgement of the selected offer along with an ancillary offer of add-on ancillary services based on the selected offer.
11. The distribution channel provider returns the acknowledgement and any offer of ancillary add-on ancillary services to the TMC

12. The TMC presents the  acknowledgement and any offer of ancillary add-on ancillary services to the travelers for decision
13. If no add-on ancillary service are offered or selected, the flow ends
14. The TMC sends the selected add-on ancillary services to the distribution channel provider
15. The distribution channel provider sends the selected add-on ancillary services to the airline
16. The airline records the selected add-on ancillary services and responds with acknowledgement of the selected add-on ancillary services
17. The distribution channel provider returns the acknowledgement to the TMC
18. The TMC presents the acknowledgement of the selected add-on ancillary services to the travelers
19. The flow ends

**Post conditions:**

- An acknowledged offer (including ancillary add-on ancillary services) is stored by the airline. The offer could be stored under one or more Offer IDs.  The inventory could be held, since this is a TMC (vs. an OTA).
- No airline returns an offer
- No offers accepted

## Use Case 2: OTA Mixing Aggregated and Direct Connect Using Shopping Basket

**Description:**

A person is shopping on-line for his family getaway for five travellers (3 Adults (one is top tier FF, one is elderly grandmother who requires oxygen), 2 CHLD and 1 INFT) via an OTA. They are looking for a Round-Trip International itinerary, for flexible dates on direct flights. They are indecisive shoppers and need to hold offers before committing.

The OTA uses both a Distribution channel provider and a direct connection to an Airline,

The booking process will add FF personalized information in to the mix.

**Principal actors (with roles):**

OTA – (Seller/ Aggregator)

Distribution channel provider (Aggregator)

Airline (Provider)

**Preconditions/Assumptions:**

The OTA has a direct connect agreement with an airline and has established when to poll them directly and not through the Distribution channel provider (avoid double polling)

Should the OTA have multiple direct connections to Airlines then they may have access to an Airline Profile Database external or cached locally.

The responses may include Bundled Fares, Unbundled Fares, as well as Bolt-on (à la carte) items.

The user has logged on to the OTA using his profile but has indicated that initial shopping be done anonymously

The Offer ID is a security key that is valid as long as nobody has manipulated the offer in anyway, therefore ensuring the authenticity of the offer.

**Steps to follow in the process:**

Shopping

1. The user enters their requirements in the OTA:
   a. Origin & Destination
   b. Travel dates
   c. Party data (number by pax type)
   d. Class of travel (economy)
   e. Max number of stops (eg none)
   f. Indicates he wants (pre-seating, is taking a Windsurfer, and granny needs oxygen)
2. The OTA checks the Airline Profiles Database, if applicable for those airlines with which they have Direct Connect
3. The OTA sends the request with the collected requirements to both the Direct Connect Airline and the Distribution channel provider:
4. Upon receiving the request the Distribution channel provider:
   a. Consults their Airline Profiles Database to ascertain to whom they should send the requests.

5. The airlines receive and process the request returning a list of offers (with IDs) for both the Flight/Fare/Ancillary bundles and separate additional Ancillary offers to the OTA
6. The Distribution channel provider has received other offers from their Airlines and packages them and returns them to the OTA
7. The OTA combines all the responses and returns them to their user
8. The user selects one of the offers (a bundle that includes the Windsurfer) and adds the oxygen and adds these offers to the OTA shopping basket. For future reference.
9. The user returns to the OTA later selecting the offer(s) from his shopping basket and indicating a change in the dates (one day later). He also indicates (having been prompted by the OTA) to include his FF number as the offer Airline is in the same alliance as his FF.
10. The OTA forwards this shopping request to the Direct Connect Airline with:
    a. Origin & Destination
    b. Specific flights as preferred
    c. New dates
    d. Party data (number by pax type)
    e. Class of travel (economy)
    f. The original offer details including the Windsurfer offer, the oxygen ancillary and the original offer ID, and still interested in pre-seating,)
    g. FF number
11. The airline receives this new request and processes it returning a new offer ID for the new dates, together with a note that seating is free for his FF tier level.
12. The OTA receives and presents the offer to the user
13. The user requests the seat maps and selects a block of seats to keep the family together on both flights. They then select the "CheckOut/Hold" to see if he can hold the reservation for 48 hours, which the OTA forwards to the airline.
14. The airline returns an ancillary service offer ID (referencing the previous offer ID's) with charge to hold res with guaranteed price for 48 hours, which the OTA presents to the user.
15. The user accepts.

**Possible Post conditions:**

- User accepts an offer and completes booking process and requests tickets to be issued
- Offer ID's have become corrupted and all details must be resubmitted for new offer ID

# Use Case 3: Corporate Booking Tool (CBT) with Companion

**Description:**

Two travellers (1 Top Tier FF and having a Corporate/Client ID number (CLID)) shopping via a CBT using a direct connection to an Airline, looking for a Round-Trip International itinerary. The shopping request will include personalized information and the customers would like to review available seats prior to selecting a bundled fare solution.

**Principal actors (with roles):**

CBT – (Seller/ Aggregator)

Airline – (Provider)

**Preconditions/Assumptions:**

- CBT will probably be sending the same request to other Airlines either through direct connections or via another Aggregator.
- Should the CBT have multiple direct connections to Airlines then they may have access to an Airline Profile Database external or cached locally.
- The necessary messages have been developed for the distribution/publication of the airline profiles.
- Due to the pre-existing agreement between the Corporation and the Airline, richer information may be sent through the direct connection to the Airline.
- The responses may include Bundled Fares, Unbundled Fares, as well as Bolt-on (à la carte) items.
- The CBT already has a CLID agreed with the Airline to enable the offer of specially agreed fares/discounts.
- The travelers have indicated in the CBT whether or not they provide consent for and what personalized information and preferences can be used and exchanged with the industry providers in the process of Shopping for and Booking/Servicing travel products and services.

**Steps to follow in the process:**

1. The user enters their requirements in the CBT:
   a. Origin / Destination
   b. Dates (indicating no flexibility)
   c. Number of Passengers (2)
   d. Seating preference (window P1)
2. The CBT checks the Airline Profiles Database for those airlines with which they have an NDC agreement.
3. The CBT sends the request:
   a. To those airlines with those airlines supporting NDC including, but not limited to, the following information:
      i. Origin / Destination
      ii. Dates (indicating no flexibility)
      iii. Number of Passengers (2)
      iv. Seating preference (window P1)
      v. CLID
      vi. FF airline and number (ancillary)

   b.  To other non NDC systems to which they are connected.

<ol type="i" start="1">
<li>Origin / Destination</li>
<li>Dates</li>
<li>Number of Passengers (2)</li>
<li>Airlines to be excluded from search (those covered in previous section a.)</li>
</ol>

<ol start="4">
<li>Upon receiving the request the Airline:
<ol type="a">
<li>Consults their CLID database to ascertain the special agreements to be applied:
<ol type="i">
<li>Wifi and FastTrack included in CLID for all eligible offers</li>
</ol>
</li>
</ol>
</li>
<li>The airline returns a list of offers (with IDs) to the CBT, indicating those flights that have window seats available.</li>
<li>The user requests seat map(s) for one of the offers of interest.</li>
<li>The Airline returns the seat maps to the CBT</li>
<li>The user selects the seats and confirms the desire to book selected offer</li>
<li>Go to Booking Flow</li>
</ol>

**Post conditions:**

- User accepts an offer and completes booking process and requests tickets to be issued
- In the response, although the flights are full the user is offered priority waitlist with an indication of how many people are ahead of him if any, which he accepts subject to having a window seat.
- None of the offers meet his requirements
- No offers are returned as all the flights are full.

## Use Case 4:   Meta Search Engine (MSE) Shopping with Attribute Shopping

**Description:**

A customer creates a search request for wholly Domestic travel within the USA for 2 adults and one infant without a seat on a Meta Search Engine (MSE) website for air travel and specifies that they would like to have travel solutions which would not incur a first checked bag fee. The customer is shopping for a leisure trip, but happens to be a frequent flyer on multiple airlines. The customer has provided personal information, including frequent flyer details in their MSE profile in order to obtain a personalized shopping response (which may require a login and will always require an opt-in to share information with airline or OTA partners.)

The customer will review solutions from multiple airlines prior to making a selection for a bundled solution that will not charge a fee for the first checked bag.

The MSE is the Seller in the Shopping phase of the process. The MSE is an NDC aggregator and also has a relationship with a distribution channel provider whom acts as an NDC aggregator. In addition, the MSE has relationships with OTAs whom also act as NDC aggregators.

This use case describes the case where browser URL links are used to connect the MSE with the airline or OTA web site. The alternative 'Facilitated Booking' method where the actors are connected by an API has not been described.

The customer has selected to have the MSE open separate browser windows, specifically one window is an airline and the other window is an OTA. In order to open relevant Shallow Link windows (with the offers), the MSE is passing NDC profile information, including the traveller's frequent flyer number. A Shallow Link is a personalized and authenticated referral to a travel marketer's website containing the information required to enable a travel marketer to generate a shopping request.

The MSE will consult the airline profile and send a personalized NDC shopping request to all airlines that align with the customer's requirements.  The MSE will also send a request to their distribution channel provider partner and OTA partners, whom will consult their airline profiles and send personalized NDC shopping requests to all airlines that align with the customer's requirements.

As results are returned on the MSE's results page, the customer chooses to perform additional searches to further refine their offer set, either by filtering the results on the MSE or by submitting new requests. The customer then selects an NDC offer that was generated by an OTA and are redirected to that's OTA's website via a Deep Link. A Deep Link connects the customer to the travel marketer's website (the website of the airline or OTA) where the MSE is authenticated. The Deep Link brings the customer directly to a page which enables the customer to continue with a purchase of a specific itinerary offer, which had been personalized for her or him when the MSE had sent the original shopping request.

**Principal actors (with roles):**

Meta Search Engine (MSE) – (Seller for initial Shopping phase and Aggregator)

distribution channel provider – (Aggregator)

Airlines – (Provider and Seller)

OTA – (Aggregator and Seller)

**Preconditions/Assumptions:**

- The customer has logged into the MSE's site and built a profile which includes personal data, including their passport number, meal preference and three frequent flyer program numbers. In addition, the customer has opted in to allow their data to be shared with traveler marketers. Also, the MSE has detected that the traveler has a predisposition for weekend trips.
- The MSE consults the Airline Profile to see if its Shallow Link participants want to receive these specific travel requirements via NDC. The MSE then generates Shallow Links based on the customer's travel requirements and based on a security tokens which were received from both the airline's designated NDC gateway, as well as from the OTA. A security token is defined as a series of characters and numbers, which the airline or OTA generated in real-time and which are used by both the MSE and the airline or OTA to track this specific transaction. The security token serves as acknowledgement to the MSE that the airline or OTA received and is storing the trip requirements. The MSE will include the security token in its links to the airline or OTA, via a Shallow Link or Deep Link depending on where the user is within the MSE's website flow at the time of the click, allowing the airline or OTA to look up the associated token ID in its own systems and identify who is the MSE that referred the user as well as retrieve the user's information that the MSE had previously passed.
- The MSE passes the personalized shopping request to NDC airlines, a distribution channel provider and to OTAs that support the NDC standard. The MSE passes anonymous shopping requests to non-NDC OTAs.
- The responses will include Bundled Fares, Unbundled Fares, as well as à la carte ancillary services.
- The airline or OTA is assumed to have implemented session blocking, such that third parties cannot use shallow links or deep links, unless that link contains a recognized security token or (in the case of a fallback URL) a permitted referrer ID.
- It is further assumed that the NDC participant has implemented its NDC gateway so that the security tokens generated by that gateway are accessible for lookup by its consumer website.

**Steps to follow in the process:**

1. The customer logs into the MSE's site and enters their search criteria into the MSE search metaphor. By logging into the site, the MSE is able to include personalized information and past shopping behavior in the search parameterization.
2. The MSE consults the Airline Profile to see if its Airline Shallow Link participants want to receive these specific travel requirements via NDC.
3. Via a secure connection, the MSE transmits to those Airline Shallow Link participants who want to handle this transaction via NDC the: MSE's own authentication credentials with that airline, the trip requirements (origin, destination, travel dates, number of passengers, and whether the trip is one-way or round-trip), the customer's personal data such as the frequent flyer number, the customer's language / locale / device, and any predispositions that the MSE has detected for this customer (characteristics of the traveler as observed by the MSE).
4. The MSE presents its Shallow Link partners that are relevant to the customer's search criteria.
5. The Airline Shallow Link participants who want to handle this transaction via NDC respond to the MSE with: their recommended consumer website URL which they deem to be most appropriate for this customer given their language / locale / device, a security token, and a marketing message.
6. The MSE updates the customer's search configuration screen with the marketing messages which were received from the NDC participants.

7. The customer clicks on one Airline, one OTA and clicks on the "Find Flights" button.
8. The MSE checks to see if it has received a recommended consumer website URL and a security token from the selected Airline and OTA. If so, it builds the appropriate Shallow Link and responds to the customer's browser with a redirect to a "highly personalized" URL. If not, the MSE builds the Shallow Link using the fallback URL structure, using a permitted referrer ID (that had been separately provided by the Airline or OTA outside this process and solely for use in situations where their response had not been received in adequate time) and with the trip requirements, and responds to the user's browser with a redirect with a "somewhat personalized" URL.
9. The Shallow Link forces a new window to open on the Airline's site. Also, a new window is opened on the OTA site.
10. The MSE then consults the Airline Profiles to determine all airlines who are interested in responding to the customer's request, then builds and sends the request to each appropriate airline, along with the relevant information from the customer's MSE profile that should be included within each request.
11. The MSE simultaneously sends the request to the distribution channel provider as the Aggregator (excluding airlines to whom they've already sent an NDC request to in the previous step), whom consults their Airline Profiles to decide to which airlines the customer's request should be sent, along with the relevant information from the customer's MSE profile that should be included within each request, then builds and sends the request to each appropriate airline.
12. The MSE simultaneously sends the request to the OTA as the Aggregator, whom consults their Airline Profiles to decide to which airlines the customer's request should be sent, along with the relevant information from the customer's MSE profile that should be included within each request, then builds and sends the request to each appropriate airline.
13. Airlines receive and process the requests from the MSE, distribution channel provider and OTAs. A security token is generated by the Airline for each offer, along with a unique Offer ID.
    o Airline A returns a set of bundled fare offers
    o Airline B returns a set of unbundled fare offers
    o Airline C returns a set of unbundled fare offers
    o Airline D returns a set of bundled fare offers
14. The MSE asynchronously compiles offers received from the Airlines, distribution channel provider and OTAs. The MSE builds a Deep Link for each offer. The Deep Link can either be constructed using the Offer ID or using a Security Token that the airline has associated to the Offer ID.
15. Customer views offers from airlines A, B, C and D (whom are all NDC airlines) in the MSE results screen.
16. Customer views results from Airline D which were sourced directly from the NDC Airline, as well as NDC offers which were provided indirectly from the airline via the OTA.
17. Customer selects the Airline D offer from the MSE results screen which was sourced indirectly via the OTA. The associated offer has a deep link to the OTA's website where the customer can complete the purchase.

**Post conditions:**

- If after the customer selects an offer, they successfully land on the OTA's website with their selected offer presented and the OTA has received and pre-populated the customer's personal information, the process is considered successful.
- If the customer is not redirected to the OTA's website with their appropriate offer selected, along with pre-populated customer information, then the scenario fails.

## Use Case 5: Leisure Travel Agency with Anonymous Affinity Shopping

**Description:**

A family member visits a high street Travel shop to book flights for their annual beach holiday. Their holiday dates are fixed but not their destination. They specify a direct flight. The travel agent does not provide any personal details to the airline suppliers during the shopping process except that they are a party of 2 adults and 2 children under 12. They also want to buy holiday Fast Track.

**Principal actors (with roles):**

Leisure Travel Agent – (Seller)

Distribution channel provider – (Aggregator)

Airlines – (Provider)

**Preconditions/Assumptions:**

- Agent uses a 'beach' affinity shopping search criteria rather than performing individual searches for a series of familiar beach destinations. This assumes that 'beach' is a destination tag that is recognizable by potential suppliers and that the Agent has a booking tool that is both capable of entering affinity shopping criteria and displaying the resulting multiple supplier product offers each with multiple and differing sets of destinations.
- There is no standard definition of what comprises a "beach" holiday, so each airline is able to respond with their own interpretation of the request
- The airline profile only holds a flag indicating whether the airline supports affinity shopping or not
- The Fast Track ancillary is bookable as part of the initial flight selling flow, eg in a shopping basket arrangement, rather than as a completely separate sale. The ancillary is assumed to be fulfilled as an EMD-A linked to the flight ticket for ticketing airlines.
- The agent has negotiated net fares for certain product types (eg IT or Seat Only) with a number of airlines accessible through an account number and is hosted on a Distribution channel provider.

**Steps to follow in the process:**

1. The agent enters the customer's requirements into their affinity booking tool & submits the request to the Distribution channel provider:
   - Origin
   - Affinity search tags (ie 'beach', max budget)
   - Class of travel (eg economy)
   - Party data (number by pax type)
   - Travel dates
   - Max number of stops (eg none)
   - Agency identifier and fare type(s) required (eg IT fares if agency intends to incorporate into a package)
2. The Distribution channel provider checks the airline profile database for airlines who handle affinity shopping and direct flights from the origin airport and passes on the request to those airlines, including the Distribution channel provider identifier. If no airline is found, the Distribution channel provider returns an error to the agency.

3   Each airline authenticates the identity of the Distribution channel provider and the agency and processes the request. If the identity cannot be authenticated then an error message is returned

4   Each airline returns to the Distribution channel provider , price ranges per set of available flight product offers with offer IDs , with their attributes, for a series of destinations closest (from the individual airline's perspective) to the request criteria & appropriate to the requesting agency. If there are no offers close enough to the criteria then the airline may reply with offers outside the criteria or return an unavailability message. Even though the request is anonymous, the airline may decide to tailor their response to the persona indicated in the request, ie a young family on a beach holiday. Some airlines may return, unrequested, ancillary product offers appropriate to the flight offer, including fast track.

5   The Distribution channel provider returns each airline's responses to the requesting agency. The agency desktop tool displays the various airline proposed destinations, total party prices and product attributes, including any ancillary offers.

6   The agency evaluates the airlines responses and relays this to the customer.

7   The customer chooses an airline offer and a destination

8   Go to Booking Flow

**Post conditions**

-   The agent is able to display a number of competing product offers meeting their customer's requirements with sufficient information on each offer for them to make an informed selection and purchase it

-   The agent receives no airline product offer

# Use Case 6: Tour Operator

**Short Tour Operator typology**

Pre Package Tour Operator – buys block space on flights and allotments in Hotels and builds packages out of the components. Offers such pre built packages at calculated prices to Customers

Dynamic Tour Operator – combines flight component and Hotel component in the moment of search by customer, calculates package price, and offers this price to Customer, buys flight and Hotel components once customer has purchased a dynamic packaged product.

In reality there are mixtures between the two basic Tour Operator types. Block Space can also be used by Dynamic Tour Operators etc.

In this use case a Dynamic Tour Operator is taken as example.

**6.1 Name: Tour Operator with Dynamic Package Building**

**Description:**

A customer is shopping on-line with a Tour Operator for his family getaway for two travellers (2 Adults) (one is a Frequent Traveller on one Airline Alliance). They intend to take one Surfboat along. They are located in a region where they have easy access to four departure airports and it does not matter to them which airport they use for their departure. They are searching for a holiday of 7 to 8 nights during for example the period of Sep 15th until Oct 10th. They have a shortlist of potential destinations and wish to have a 4 to 5 star accommodation near the beach.  They also prefer to leave mid-day from their departure airport and return after 6pm from their destination.

The Tour Operator uses a Distribution channel provider and direct connections to several airlines for obtaining offers for the flight part of the journey.

**Principal actors (with roles):**

Customer/consumer

Tour Operator – (Seller/ Aggregator/partially taking the role of the customer and acts on behalf of the customer, for example decides which fare types should be requested)

Distribution channel provider (Aggregator)

Airline (Provider)

**Preconditions/Assumptions:**

There are different forms of contractual relationships between Airlines and Tour Operators.

- Tour Operator has chartered a block of seats which cannot be returned but are considered being sold. (Block Charter)
- Tour Operator negotiated a block of seats out of which seats are automatically released back to the airline if not sold by the Tour Operator.(Nego Space)
- Tour Operator negotiated fares with the airline which are specific to the Tour Operator (Nego Fares).
- Tour Operator negotiates with the airline to use special airline fares only for the construction of packages. (Opaque Pricing)
- Tour Operator uses public fares, like an agency.

For Block Charter, Nego Space and Nego Fares it is assumed that the Tour Operator and the airline have agreed a reference or contract number which is used in the message dialogue.

For simplicity reasons it is assumed for this use case that Tour Operator has negotiated fares on some routes, has agreed opaque pricing and access to public fares.

It is also assumed that the Tour Operator has its own packaging system with customer files and payment system.

Tour Operator partially acts on behalf of the Customer during the Shopping and Booking phase. And decides which airline products could be part of the Tour operator package. Tour Operator has contracts with airlines for payment, included ancillaries, prices on ancillaries for Tour Operators, Tour Operator does not publish such contracted conditions to the customer or the public.

Wide area searches with multiple dates during shopping should be possible in 500 ms or similar. Or else the customer will not have a positive shopping experience. Since Customer iterates his selection process/or process leads automatically to repeated searches/offers performance is a major issue tor such Tour Operator based use cases.

**Steps to follow in the process:**

1. The Customers enter their requirements in the Tour Operator System:
   a. Potential Departure and Destination Airports
   b. A period for when the holiday can take place
   c. The potential durations
   d. Preferred departure times
   e. Party data and Frequent Traveler numbers
   f. SSR request (Surfboard)
   g. Preferred Hotel categories and other location attributes
   h. A maximum price per person travelling for the Tour package
2. The Tour Operator System analyzes the request and adds to request additional parameters like
   a. Request for Economy Class lowest fare
   b. Request for Economy Class lowest fare for nonstop flights
   c. Request for Economy Class negotiated fares (with contract number, identifier)
   d. Request for Economy Class refundable fare
   e. Luggage for each passenger according to the policy of the Tour Operator.
   f. Which Airlines to request an offer from (both through the Distribution channel provider as well as through direct connects or third party aggregators)
3. The Tour Operator system determines any combination of travel durations within the holiday period.
4. The Tour operator system does the same for all potential Hotels fitting to the parameters provided by the customer.
5. The following Options are given because of performance considerations. Even for complex shopping requests the response time for the consumer should be in the range below 0,5 sec.
   a. Option 1
   b. The Tour Operator system sends any requested combination to the selected airlines (according to 2 e.) above.
   c. Option 2
   d. The Tour Operator system translates the request in affinity/attribute shopping requests which are sent to the selected airlines.
   e. Option 3
   f. The Tour Operator finds the bulk of the air price information in own caches which are fed by the airlines cooperating with the Tour Operator. Only Special customer attributes with a potential effect for the price of the air component are requested to the airline systems.
6. The Distribution channel provider, the third party aggregator and the direct connect airlines receive and process the requests returning a list of offers (with IDs) for both the

Flight/Fare/Luggage etc. bundles and separate additional Ancillary offers to the Tour Operator system.

7. The Tour Operator dynamically combines all the responses with the Hotel responses. And applies yield managed margins to the components and/or the results.
8. Air component prices and Hotel component prices will not be transparent to customer.
9. All combined (Air/Hotel/Transfer) results are presented to consumer.
10. The Customer selects one of the offers or stores the offer for reference purposes.
11. Potential Re-shopping
    a. Customer wants to change flight relevant part of the tour package before customer has created a booking.  In this case customer goes back to the search process. All offers which had been created so far are released and replaced by offers created during the new search process.
    10. Once the customer selects an offer the customer can request additional ancillaries for his flight, his hotel, or excursions etc.
    11. For example for selected flights special meals and select your seat could be offered within the Shopping dialogue with the Airline System through the Tour Operator System.
    12. The Tour Operator system could then offer a hold time for its products and will offer this feature if both the selected airline and the selected hotel provide such features.
    13. The customer accepts.

**Possible Post conditions:**

On behalf of the Customer Tour Operator accepts an offer and completes booking process and requests tickets/EMDs to be issued.


## 6.2 Flow for Block Space Shopping

Same flow as above. Block Space/Nego Space seat would be requested with Reference number/Contract number or other identifier. Response of airline contains same reference.

Yield Management of Tour Operator will decide at which price block space seat is calculated within the package price and whether this block space seat is offered to the Customer or not.

## Use Case 7: Through-Fare Journeys on Interline Marketing Carriers

**Description**

This use case describes the process of creating through-fare journeys with multiple marketing carriers (no codeshare) in the NDC world[1].

**Principal actors**

- Aggregator/Seller[2]
- Offer Responsible Airline (ORA)
- Participating Offer Airline (POA)

**Assumptions**

1. BSP/ARC setup processes as before BUT the NDC airline (ORA) rather than Aggregator needs to be certified to send RET (or corresponding ARC file).  It is possible for the Aggregator to do this on behalf of the airline. BSP/ARC Airlines join a BSP/ARC and get certified to report sales.  BSP/ARC accredits Agents into BSP/ARC Airlines select Agents in BSP/ARC.

2. If Agent defaults, BSP/ARC informs Airlines to immediately remove ticketing authority.

3. In airline bankruptcy, BSP/ARC informs airlines & agents to cease further NDC requests.

4. There are no changes to ticketing, revenue accounting, audit, and settlement processes, **except** they may need to be revised to accept the content from a different source and/or format (e.g. via XML) and/or they must incorporate offer IDs and dynamic fare details.

5. Existing industry-agreed upon fare selection criteria (currently used to identify a primary/controlling airline for the fare) need to be incorporated in NDC.  The airline providing the offer (ORA) for the air travel must be the airline identified based on the process defined in IATA Composite Resolution 017ha.  This airline controls the fare and impacts airlines that are able to ticket the itinerary (which can further impact the retention of YQ/YR and other fees). NDC airlines are expected to abide by the process defined in this resolution when providing offers.

6. For future use cases involving baggage:  Existing regulatory requirements and industry-agreed upon criteria for identifying the airline whose baggage allowance and charges apply need to be incorporated in NDC.  The airline providing the offer/sub-offer for baggage must be the airline identified via IATA Composite Resolution 302, including the US DOT reservation to 302.  NDC airlines are expected to abide by this resolution when providing offers.

7. Interline partners will exchange ticket coupon control per existing IATA Resolution 722f.

8. The ORA is able to build or has access to all necessary content, such as schedules, connection building, Minimum Connect Times (MCT), fares, fare rules (including reissues, refund), taxes, fees, baggage, airline profile, mileage, currency conversion, and ancillaries.

9. The ORA's pricing system is able to identify points of sale, "who is asking" (customer, travel agent, aggregator), and any other criteria necessary for producing product offers.

10. The ORA is the validating carrier[3].

---

[1] Initially this UC only addresses fares.  Future iterations will address ancillaries, baggage, taxes, and fees (e.g. YQ/YR, OB).

[2] The Interline Taskforce proposes renaming this to be Purchaser or Requestor in order to more accurately reflect the actor. This use case applies regardless of whether the request comes from an aggregator or directly from a seller.

[3] Third party validating carrier requirements are an outstanding issue to be addressed by the Steering Group.

**Preconditions**

The consumer/ passenger/ agent has a travel plan.  For example:  passenger wants to travel LHR-MNL.

The ORA establishes the through-fare for travel including other marketing carriers (POAs).  There is no direct NDC communication between the ORA and POA(s).  The fare is established by using one of the following scenarios:

1. **Scenario A1:  Published Through-Fare based on existing interline settlement agreements.**
   The ORA creates the offer using a published fare.
   - Airlines authorize data distribution which could be (but does not have to be) through a central fare distribution shop (for example, a data bank agreement signed with a central fare distribution shop)
   - Airlines agree to participate as a secondary airline on an OAL fare (for example, a concurrence agreement with a central fare distribution shop)
   - Fare and fare-related data may be distributed through a central fare distribution shop to support:
     - Regulatory bodies
     - Pricing
     - Ticketing and Baggage agreements (which require an airline to disclose where their tariff is)
     - Auditing
     - Settlement
   - Distribution, dependent upon the airline's business needs, may be:
     - Private:  Limited only to systems authorized by the airline.  For example, data is distributed only to the airline's internal pricing system or directly only to one pricing system
     - Public:  Open to anyone.  For example, data is distributed to all pricing systems.

2. **Scenario A2:  Non-Published Through-Fare based on existing interline settlement agreements.**
   The ORA creates the offer based on settlement data that has already been negotiated with the POA.  Such data is not published.

**Basic Flow**

1. Aggregator/Seller  identifies ORA's that will accept requests for the LHR-MNL travel plan (e.g. Airlines XX, A1, A2, A3)
2. Aggregator/Seller generates a shopping request and sends it to the ORAs (e.g. Airlines XX, A1, A2, A3).
3. ORA builds the connections using schedules and rules (such as minimum connect times) and other product features (such as ancillaries) for the ORA and any interline partners.
4. **Scenario A1[4]:**
   a. ORA (Airline XX) has a published through fare that includes secondary travel on airline ZZ.
   b. ORA (Airline XX) queries POA (Airline ZZ) for availability, if applicable.

---

[4] Ancillary and Baggage Data will be included in the offer communication in a future use case.

5. **Scenario A2[5]:**
    a. ORA (Airline XX) has a pre-negotiated settlement agreement with airline ZZ.  Based on this agreement, ORA creates a non-published fare that includes secondary travel on airline ZZ.
    b. ORA (Airline XX) queries POA (Airline ZZ) for availability, if applicable.
6. ORA (e.g. Airline XX) packages the final offer which must include all applicable taxes and fees for the itinerary.
7. ORA provides offer to Aggregator/Seller.
8. Aggregator/Seller displays all product offers to the customer (e.g. offers from airlines XX, A1, A2, A3).
9. Customer selects an offer (e.g. LHR-HKG-MNL for airline XX).

*Steps 10 to 28  are not in scope of Shopping and included in Appendix A to this Use Case for context*

**Alternate Flow 1**

1. ORA informs the Aggregator/Seller the offer is no longer valid
2. ORA may invalidate the offer in its system
3. Use case ends.

**Post conditions**

Interline through fare ticket is issued, flown and settled.

---

[5] Ancillary and Baggage Data will be included in the offer communication in a future use case.

**Use Case 7: Appendix A**

*The following steps 10 to 28 are not in scope of Shopping, and are included for context*

10. Aggregator/Seller acquires and provides passenger data to the ORA (e.g. Airline XX).
11. ORA validates that the offer complies with the time limit set by ORA.
    a. If the offer does not comply with the time limit, go to **Alternate Flow 1**
12. ORA (e.g. Airline XX) creates the master PNR record and creates a booking in its system.
13. ORA forwards the PNR data to POA (e.g. Airline ZZ).
14. POA creates a PNR copy in its system and a confirmation is sent back to ORA, including Ticketing Time Limit, if applicable per carrier agreements.
15. ORA provides PNR details to the Aggregator/Seller, including Ticketing Time Limit (most restrictive), if applicable per carrier agreements.
16. Aggregator/Seller confirms the booking and provides Form of Payment details before the time limit expiry of the booking.
    a. In case Aggregator/Seller doesn't confirm the booking by the Ticketing Time Limit, go to **Alternate Flow 1**
17. Entity requesting ticketing (e.g. Aggregator/Seller) authenticates the Form of Payment.
18. Entity requesting ticketing (e.g. Aggregator/Seller) sends a ticketing request to the ORA and the ORA issues the ticket (neutral or airline stock).
19. ORA provides confirmation ticket numbers to the entity requesting ticketing (e.g. Aggregator/Seller).
20. Validating carrier (ORA) generates an Agent Reporting file (RET)[6] for all sales/refunds made on that day and forwards it to the respective BSP data processing centre.
21. BSP data processing centre will process the RET files and generate Hand Off Tapes (HOT) and ensure that the funds are collected from the Agent/Credit Card company and remitted to the validating carrier (ORA).
22. The validating carrier (ORA) pushes control to the operating carrier (POA) (or its handling agent) or the operating carrier requests control from the validating carrier.
23. ORA checks in the passenger. ORA's coupon goes to "checked in" status.
24. ORA flies the passenger on its sector (e.g. Airline XX flies the passenger LHR – HKG). Coupon status changes to "flown".
25. POA checks in the passenger. POA's coupon goes to "checked in" status.
26. POA flies the passenger on its sector (e.g. Airline ZZ flies the passenger HKG – MNL). Coupon status changes to "flown". POA sends "flown" status to ORA as the validating carrier.
27. ORA returns Settlement Authorization Code (SAC) to POA for billing.
28. ET coupons are settled as per the existing interline settlement procedures and rules (which may need to encompass offer IDs and/or new source for content).

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[6] It is possible the aggregator may generate the RET
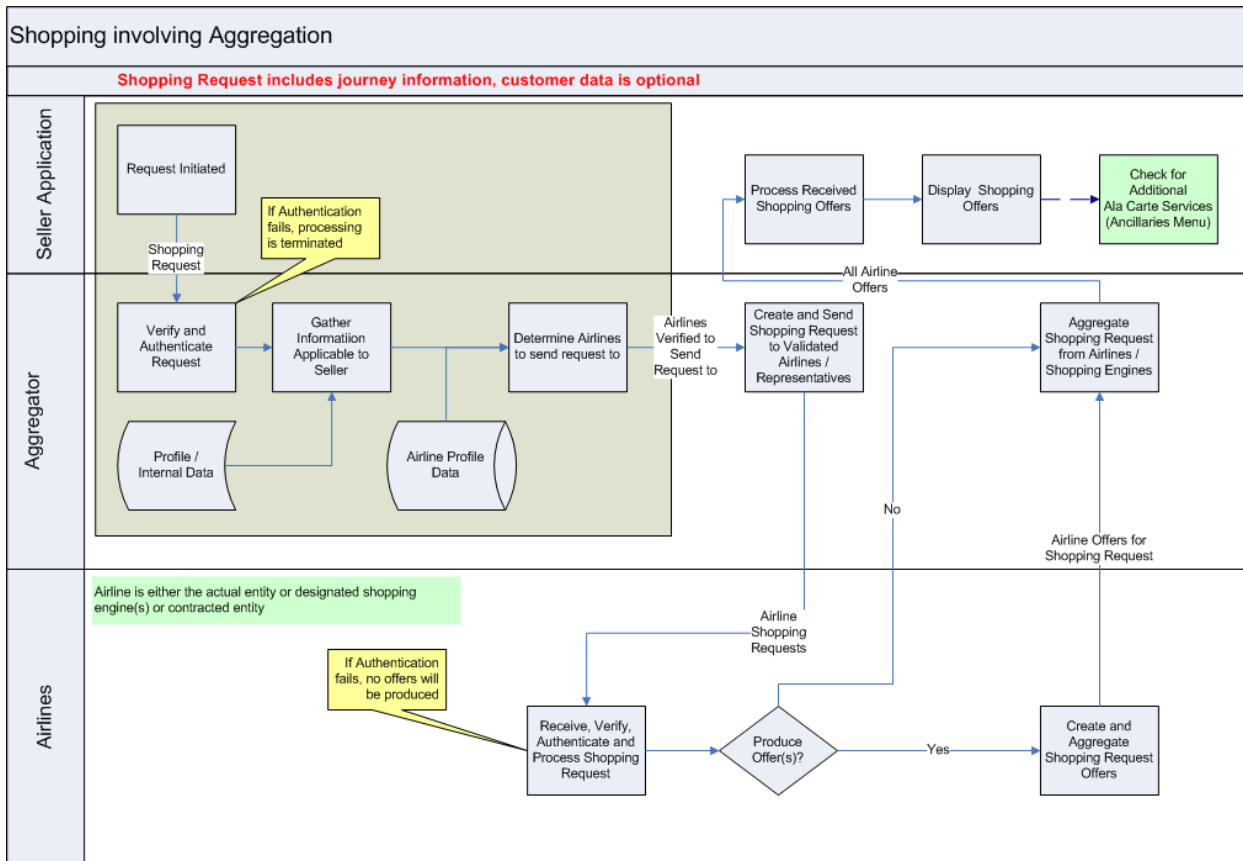
# Appendix B: Process Flows

## B1 Shopping Without Aggregation
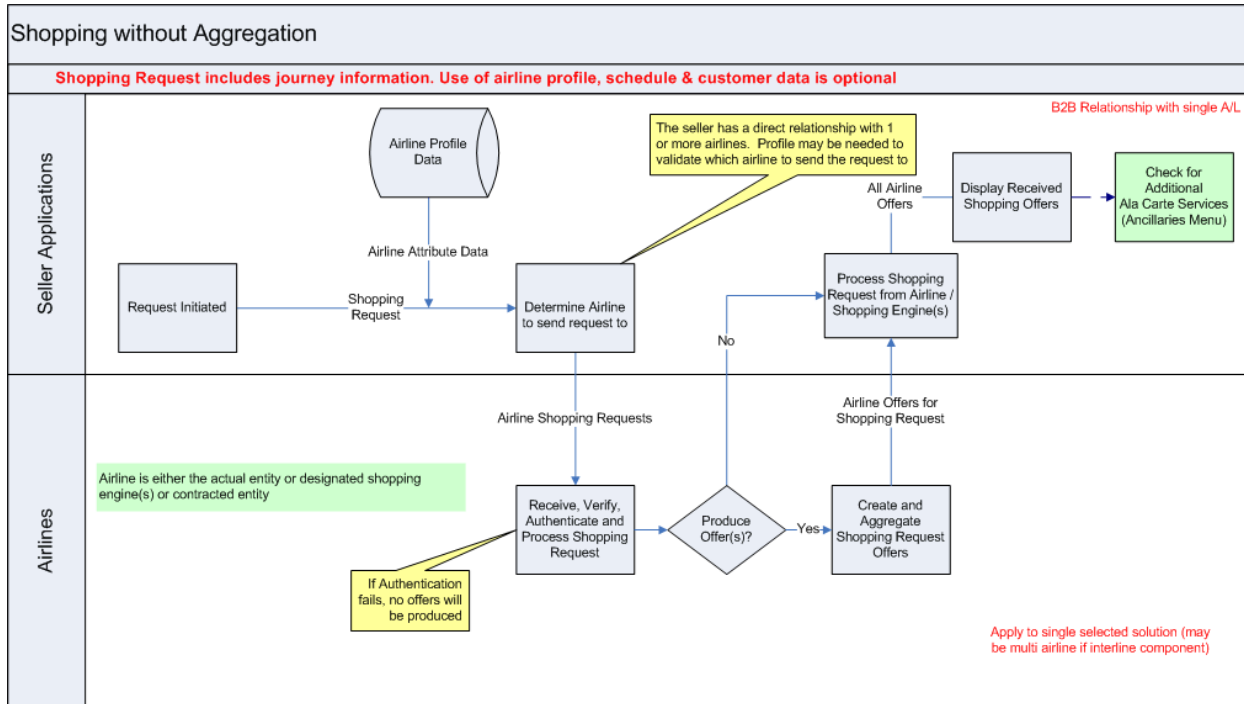


High Level Process

1. The Seller creates a shopping request on behalf of their customer and uses the information in the shopping request and ancillary, Airline Profiles to determine which airlines want to receive such requests and passes it to them
2. An airline on receiving a request, authenticates the source and processes the request to either return a product offer to the Seller or not.
3. The Seller compiles all returned offers from Airlines and displays them for their customer to make a selection.

## B2 Shopping With Aggregation



High Level Process

1. The Seller creates a shopping request on behalf of their customer and sends it to one or more aggregators

2. An Aggregator authenticates the source of the received request and uses the information in the request and Airline Profiles to determine which airlines want to receive such requests and passes it on to them

3. An airline on receiving a request, authenticates the source and intermediaries and processes the request to either return a product offer to the Aggregator or not

4. An Aggregator compiles all returned offers from Airlines and passes them to the Seller

5. The Seller compiles the responses from Aggregators and displays the airlines' offers for their customer to make a selection

## B3 Ancillary Shopping Without Aggregator
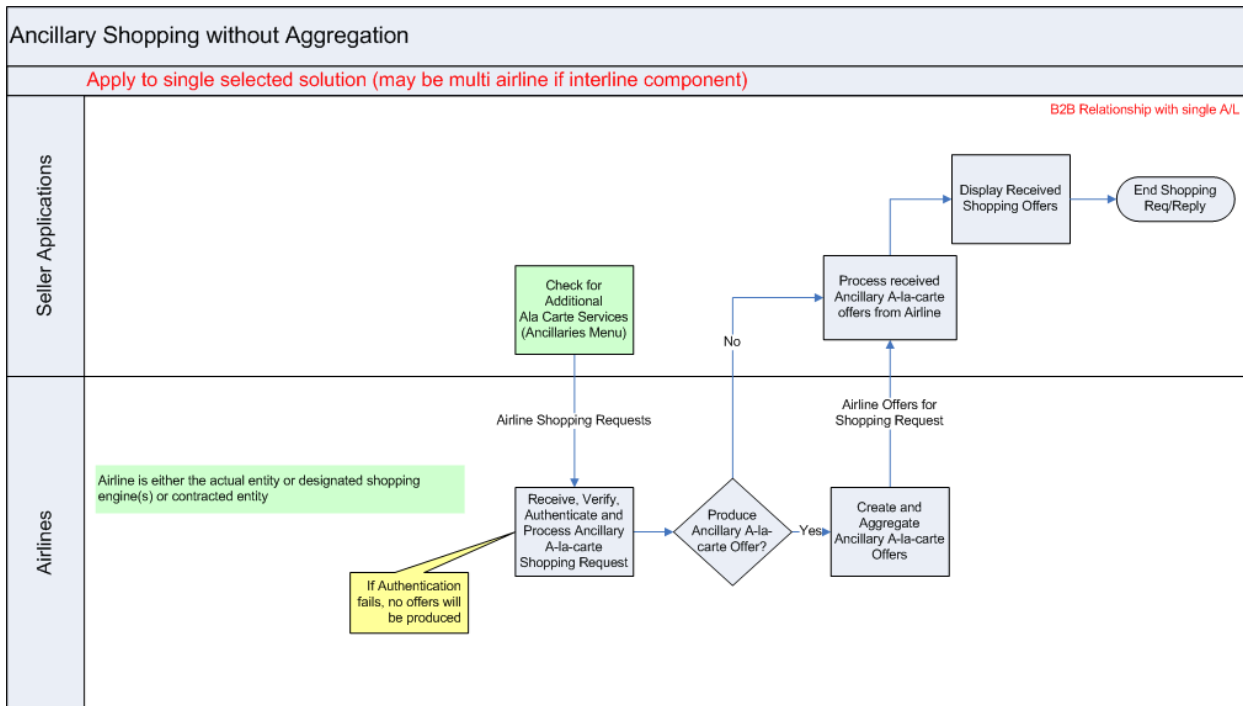


High Level Process

1. The Seller makes a request for available additional a-la-carte ancillary services for the selected airline product offer and passes it to the selected airline
2. The airline, on receiving the request, authenticates the source & product offer IDs and processes the request and returns to the Seller: offers for available ancillaries and error messages where an ancillary is unavailable or is not eligible.
3. The Seller displays the ancillary offer(s) for their customer to make a selection

## Appendix C: List of Attachments

List of attachments referenced and included with this Business Requirements Document:

1. Airline_Shopping_Schema.zip
2. Airline_Shopping_Schema_Release_Notes.pdf
3. Airline_Shopping_Schema_vs_BRD_Qualifiers_Gap_Analysis.xls
4. NDC_BRD_Shopping_BRD_QualifiersSupporting_v71_Gap_Analysis_vs_OpenAXIS_Rev5

## Appendix D:  Shopping Response ID and Offer ID

**Use Case: Offer Management**

**Principal actors (with roles):**

**Customer:** interacts with Seller

**Seller:** sends shopping requests and displays airline responses

**Airlines**: Responds to Seller requests for offers

**Preconditions/Assumptions:**

- Seller system has a shopping basket capability (ie a way for a customer to  select multiple individual offers they are interested in purchasing)
- Seller system is able to show multiple airline branded fare options and is able to display airline a la carte ancillary offers
- Airline has a system for managing the offers that it generates and is able to support bundled and personalized offers

**Post Conditions:**

Seller has an accountable document record identifier for an Airline Order

**Description:**

Seller directly connects to Airline to shop for Product Offers.  Responses will include any or all of: bundled product offers, unbundled product offers, as well as a la carte ancillary services.  There are 2 passengers, a high value frequent flyer and a non-frequent flyer scheme member. Settlement is via BSP.

**Steps to follow in the process:**

1. Seller sends an anonymous shopping request to the Airline for an economy return from A to B on a date.
2. Airline returns product offers for a discount economy offer and a fully flexible branded fare that includes lounge access in a bundled offer. In addition the airline returns a selection of a la carte ancillary offers and a 'pick 3 out of a possible list of 5 ancillaries' product bundle. The Airline uniquely identifies this set of offers with a Shopping Response ID in its offer management system (see *Scenario 1A*) and records the price offered against each product against an Offer ID within the Shopping Response. The combination of the source Airline, the Shopping Response ID and an individual Offer ID is unique. Individual products (as indicated by their Service ID) may be present in individual offers and in combination with other products in a bundle.
The Shopping Response has an Offer Time Limit by which the Seller must reserve any of the included offers.
3. Customer makes a selection from among the products returned. Seller requests the Airline to reserve these product offers referring to them by their Shopping Response and individual Offer IDs (see *Scenario 1B*).
4. Airline looks up the Shopping Response ID in their Order Management system and:

    **4a** the Offer Time Limit has expired. Airline re-prices selected offers:

      if offer unchanged go to 4b

else the Airline issues a new set of offers to the Seller – go to step 2

Airline periodically deletes all the Shopping Response offers that have an expired Offer Time Limit

**4b** the Offer Time Limit has not expired. Airline reserves inventory for the requested products and returns a Booking Time Limit by which time the Order must be completed.

5. Seller sends passenger details to Airline, identifying 1 passenger as a high value frequent flyer recognised by the Airline and the other as having no recognisable frequent flyer status. Seller requests Airline to complete the Order, referring to the Shopping Response and selected Offer IDs

6. Airline looks up the Shopping Response ID in their Offer Management system and:

   **6a** Booking Time Limit (BTL) has expired.  Airline re-prices selected offers:

   if offer unchanged go to 6b

   else the Airline issues a new set of offers to the Seller – go to step 2

   Airline periodically deletes all the Shopping Response offers that have an expired BTL

   **6b** BTL has not expired. Airline reserves requested products, creates an Order and returns a Ticketing Time Limit by which time an accountable document must be issued for the Order.

   In addition the Airline returns additional personalised offers for the individual passengers complementary to their existing reserved offers. Seat selection is available at no charge to the frequent flyer but at a charge to the non-frequent flyer (see *Scenario 1C*).

7. Customer adds the Seat Selection ancillary to their basket for both passengers. Seller sends a Seat Availability request to the Airline, referring to the offers by their Shopping Response and individual Offer IDs.

8. Airline returns priced available seat map.

9. Seller displays seat map, Customer makes seat selection, Seller returns selection to Airline requesting reservation and including the Shopping Response and Offer IDs.

*Note: Steps 10 to 14 are not in direct Airline Shopping Scope, and are added for clarity and completeness*

10. Airline reserves requested products.

11. Seller requests Airline to re-price the Order prior to payment.

12. Airline re-prices the Order and returns to Seller.

13. Seller takes payment from customer and requests Airline to issue accountable documents for the Order.

14. Airline looks up the Order and:

    **14a** Ticketing Time Limit (TTL) has expired, expiry message returned to Seller.

    Airline periodically deletes all the Orders that have an expired TTL.

    **14b** TTL has not expired. Airline re-prices Order, creates accountable document records for the Order and returns the record identifiers to the Seller.

**Scenario 1A Airline Response to Anonymous Request: Travel A to B, Economy Return**


&lt;ShoppingResponseID&gt; '999999999999001' &lt;Source&gt; 'Global Airways'
   &lt;Passenger&gt; 'Anonymous' &lt;PTC&gt; 'Adult'

| | | |
|---|---|---|
| 'Discount Restricted Economy' | &lt;FareID&gt; 'A001' | &lt;OfferID&gt; '01' '$200' |
| 'Flexible Economy Bundle' | &lt;FareID&gt; 'A002' | &lt;OfferID&gt; '02' '$300' |
| includes: 'Lounge Access' | &lt;ServiceID&gt; 'B001' | |
| | | |
| 'Lounge Access' | &lt;ServiceID&gt; 'B001' | &lt;OfferID&gt; '10' '$20 |
| 'Seat Selection' | &lt;ServiceID&gt; 'B002' | &lt;OfferID&gt; '11' '$30' |
| '1$^{st}$ Extra Bag' | &lt;ServiceID&gt; 'B003' | &lt;OfferID&gt; '12' '$40' |
| '2$^{nd}$ Extra Bag' | &lt;ServiceID&gt; 'B004'' | &lt;OfferID&gt; '13' $50' |
| 'Wifi On Board' | &lt;ServiceID&gt; 'B005 | &lt;OfferID&gt; '14' '$10' |
| 'Premium Meal' | &lt;ServiceID&gt; 'B006 | &lt;OfferID&gt; '15' '$30' |
| 'Any 3 of 5 Ancillary Bundle' | &lt;ServiceID&gt; 'C001' | &lt;OfferID&gt; '20' '$100' |
| Includes: 'Lounge Access' | &lt;ServiceID&gt; 'B001' | |
| 'Seat Selection' | &lt;ServiceID&gt; 'B002' | |
| '1$^{st}$ Extra Bag' | &lt;ServiceID&gt; 'B003' | |
| 'Wifi On Board' | &lt;ServiceID&gt; 'B005' | |
| 'Premium Meal' | &lt;ServiceID&gt; 'B006' | |

**<u>Note:</u>** OfferID is associated with a price – whether an individually priced item or bundle. The product item sold under the offer is identified by its Fare/Service ID. Some products may be a bundle of individual products, each additionally identified by their own Service ID.

**Scenario 1B: Selected Offers returned to Airline**

&lt;ShoppingResponseID&gt; '999999999999001' &lt;Source&gt; 'Global Airways'
  &lt;Passenger&gt; 'Anonymous' &lt;PTC&gt; 'Adult'
      'Flexible Economy Bundle'   &lt;FareID&gt; 'A002'     &lt;OfferID&gt; '02' '$300'
      includes: 'Lounge Access'   &lt;ServiceID&gt; 'B001'

      'Any 3 of 5 Ancillary Bundle'  &lt;ServiceID&gt; 'C001'    &lt;OfferID&gt; '20' '$100'
      Includes: '1$^{st}$ Extra Bag'   &lt;ServiceID&gt; 'B003'
              'Wifi On Board'   &lt;ServiceID&gt; 'B005'
              'Premium Meal'   &lt;ServiceID&gt; 'B006'

**Note**: Seller's response shows which optional items in an offer have been selected for reservation.
If there are further shopping sessions, it is expected that the airline will know which items have already been reserved so that the airline has a complete picture of reserved and new items in the shopping basket

**Scenario 1C: One passenger identifies themselves as high status frequent flyer**

&lt;ShoppingResponseID&gt; '999999999999001'     &lt;Source&gt; 'Global Airways'
  &lt;Passenger&gt; 'High status FQTV' &lt;PTC&gt; 'Adult'
      'Flexible Economy Bundle'   &lt;FareID&gt; 'A002'   &lt;OfferID&gt; '02' '$300'
      includes: 'Lounge Access'   &lt;ServiceID&gt; 'B001'

      'Any 3 of 5 Ancillary Bundle'  &lt;ServiceID&gt; 'C001' &lt;OfferID&gt; '20' '$100'
      Includes: '1$^{st}$ Extra Bag'   &lt;ServiceID&gt; 'B003'
              'Wifi On Board'   &lt;ServiceID&gt; 'B005'
              'Premium Meal'   &lt;ServiceID&gt; 'B006'
      'Seat Selection'            &lt;ServiceID&gt; 'B002' &lt;OfferID&gt; '31' '$0'
      'Book of 3 Economy Returns'  &lt;ServiceID&gt; 'C002' &lt;OfferID&gt; '30' '$1000'
              'Open Itinerary 1'   &lt;ServiceID&gt; 'D001'
              'Open Itinerary 2'   &lt;ServiceID&gt; 'D002'
              'Open Itinerary 3'   &lt;ServiceID&gt; 'D003'

  &lt;Passenger&gt; 'No FQTV status' &lt;PTC&gt; 'Adult'
      'Flexible Economy Bundle'   &lt;FareID&gt; 'A002'   &lt;OfferID&gt; '02' '$300'
      includes: 'Lounge Access'   &lt;ServiceID&gt; 'B001'
      'Seat Selection'            &lt;ServiceID&gt; 'B002' &lt;OfferID&gt; '11' '$30'

Once passengers differentiate themselves, airlines may return new personalised offers for specific passengers along with currently selected offers