

Dynamic Pricing Engine (DPE)

Revenue Accounting Discussion Paper



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1 Overview

The Dynamic Pricing Working Group, established by ATPCO in 2016, addresses how airlines will be able to create customized offers in both traditional and NDC environments.

A pilot phase was initiated to focus on addressing the need to optimize the price points an airline wishes to offer along a demand curve. The two possible approaches being investigated are:

- **Dynamic Fare Adjustment.** The introduction of a dynamic pricing engine (DPE) will allow an airline to take a base published fare (already calculated based on journey characteristics and broad segmentation) and further adjust the fare after evaluating details about the traveler and current market conditions.
- **Two-Character RBD.** The expansion of the number of RBDs (Reservation Booking Designators) enabled through implementation of two-character RBDs provides the ability for expanded fare product segmentation while utilizing current methods and systems.

This document provides an overview of the **Dynamic Fare Adjustment approach** (via use of a DPE) and identifies impact areas for revenue accounting and audit processes.

1.1 Dynamic Fare Adjustment

A new pricing mechanism that has emerged from the ATPCO Dynamic Pricing Working Group is the Dynamic Pricing Engine (DPE). DPEs, which are proprietary to each airline and apply the unique business logic of each airline individually, work by applying dynamic price adjustments to the pre-filed prices that would ordinarily be offered by the airline's RM system. Since the amount of the adjustment could vary from transaction to transaction, the DPE is the first next generation pricing mechanism that allows airlines to offer prices that are not included on a list of that airline's pre-determined price points, thereby significantly enhancing pricing flexibility and better matching supply and demand, increasing output and competition overall. This means that a DPE could be used to facilitate both Dynamic Price Adjustment and Continuous Pricing, as long as the appropriate number of price points are accommodated. This document focuses on the DPE's use in facilitating Dynamic Price Adjustment

Early working group discussions focused on interconnectivity standards and whether the price adjustment would occur to the base fare or the total fare (inclusive of taxes, fees and surcharges). Participants agreed, for the initial solution, the DPE will adjust the base fare and the pricing system will continue to be responsible for calculating the total fare. This resolves some regulatory concerns regarding total fare disclosure responsibilities that currently reside with the pricing systems as well as paves the path towards interline solutions where it may be possible for multiple interline DPE responses to be consolidated into a single pricing solution.

Currently, the solutions identified require a filed fare or Fare by Rule fare with the same terms and conditions to facilitate the process.

Two solutions have been identified that support dynamic pricing through a DPE, with some differences in the mechanisms used to communicate the Dynamic Price as well as integration into other processes.

Solution A: DPE with Dynamic Fare Adjustment

Solution B: DPE with FBR Trigger

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A high-level lifecycle description of each of these solutions is provided below, along with identification of possible revenue accounting impacts.

2 Solution A: DPE with Dynamic Fare Adjustment

In this solution, the shopping/pricing systems (airline or 3rd party) will create possible pricing solution(s) utilizing its independent existing schedules, fares and related data and send the solution to the airline's proprietary Dynamic Pricing Engine(DPE) requesting possible adjustment. The DPE will adjust the price (or not) depending on its (i.e., the airline's) internal business rules and return adjusted fares. The shopping/pricing system will recalculate the total (including taxes, fees, surcharges) and return a shopping/pricing response.

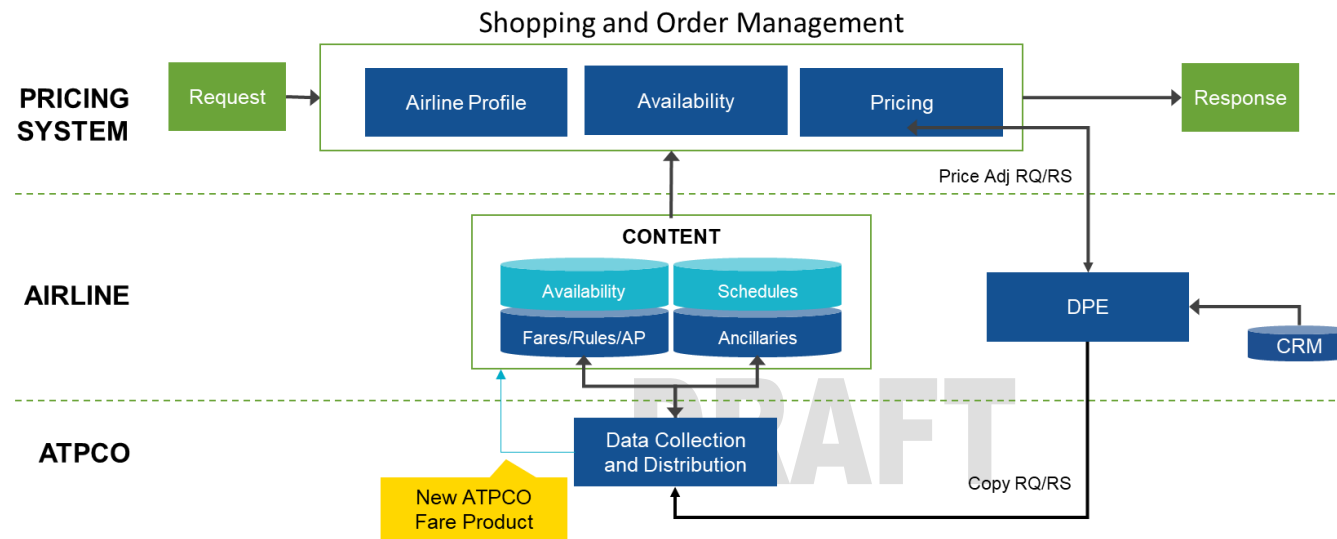
Depending on airline requirements, the DPE will send a copy of the request and response messages to ATPCO. ATPCO in turn will distribute the adjusted fare as a new private fare product solely for use in downline processing such as revenue accounting, fare management, and servicing (i.e., in the initial phase the adjusted fare is not distributed to other airlines).

The solution is defined such that the shopping/pricing system may be an external system (e.g. Global Distribution System (GDS) or internal airline system.

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2.1 High Level Processing Flow

Solution A



1. **Content Collection and Distribution:** ATPCO will continue to collect and distribute fare and rule data as it does today.
2. **Shopping/Order Management:** This system receives a request and continues to do what it does today, which is to pull in fares and rules and create pricing solutions (including calculation of taxes, fees, surcharges, and minimum checks).
 - a. **Dynamic Pricing Engine RQ/RS:** At this point the DPE layer is added. Before a pricing solution is presented to the customer, the system will send the pricing solution to the airline DPE, requesting an adjustment to the base fare(s) (the decision logic of whether to adjust or not adjust a fare, as well as the underlying data set informing these determinations, is strictly proprietary to the airline's DPE). Once a decision is made in the airline's DPE, the adjusted (or unadjusted) base fare(s) is returned to the system

- b. **Recalculation/Aggregation:** The system then recalculates the total fare to include taxes, fees and charges (e.g. to recalculate charges expressed as a percentage of the fare), and presents the pricing solution to the customer
 - c. **Copy of DPE RQ/RS:** ATPCO receives copy of DPE RQ/RS, identifies Fare information and creates a Dynamically Adjusted Fare (DAF)
3. **DAF distribution:** DAF to be distributed as a private fare for Revenue Accounting and Decision Support.

2.1.1 In Scope

The following are in scope for the initial implementation:

- **Base Fare Adjustment.** Dynamic adjustments are only applied to base fares. Dynamic adjustments are not applied to surcharges, fees, taxes, optional services, baggage, or any validating carrier charges. This resolves some regulatory concerns regarding total fare disclosure responsibilities that currently reside with the pricing systems (and will continue to reside with pricing systems) as well as paves the path towards interline solutions where it may be possible for multiple interline DPE responses to be consolidated into a single pricing solution.
- **Public/Private Fares.** All public or private fares (except net fares as specified below) are eligible to be sent in a Shopping/Pricing request to the DPE (pending applicable DPE Airline Profile data) for possible adjustment. This includes:
 - Published (specified) fares
 - Constructed fares
 - Fares created from Discounts (Categories 19-22) or Fare by Rule (Category 25)

NOTE: The new ATPCO distribution product will distribute the adjusted fare as a private fare, regardless of the public/private status of the original base fare.

- **Online Fare Owning Carrier.** Only journeys consisting of fares with the same fare owning carrier are supported for the initial solution. The fares may contain online or interline travel within the fare component (including codeshare) but must be

the same fare owning carrier. Interline pricing solutions (i.e. interline fares used in combination) will be supported pending system and DPE readiness.

2.1.2 Out of Scope

The following are out of scope for the initial implementation:

- Negotiated Fares (Category 35) with Display Category Type T (net) or C (net with update)
- Dynamic adjustments to services (e.g. pre-reserved seat assignments), baggage, and other fees.
- Dynamic adjustments to Total Fare
- Pricing solutions with a fare construction plus up applicable to a pricing unit (e.g. CTM). These solutions will not be sent to the DPE.
- Pricing solutions where at least one fare does not allow a combination with dynamically adjusted fares. These solutions will not be sent to the DPE.
- Adjustments to:
 - Surcharges, Stopover and Transfer fees
 - Carrier Imposed fees (YQ/YR)
 - Ticketing Fees (OB)

2.2 Shopping

This section defines the shopping process for Solution A.

1. System receives a shopping request
2. System creates possible pricing solutions (processing schedules, fares, and fare related data), including calculating total price (taxes, fees, surcharges).
3. System queries the DPE Airline Profile to identify airlines that support DPE requests.
 - a. For airlines that support DPE via Dynamic Fare Adjustment, system also attempts to match the base fares in the pricing solution against the data in Fare Identification Table 189 to determine each fare's eligibility to be sent to the DPE.
 - b. For eligible fares, send pricing solution(s) to DPE
 - c. For non-eligible fare, do not send this fare to DPE. (It is possible the fare will be part of a pricing solution that does contain an eligible fare, in which case that solution will be sent to DPE.)
4. System requests Dynamically Adjusted Fares from DPE utilizing a Shopping RQ.
5. DPE receives request and adjusts base fare amount(s) based on each airline's independent business logic reflected in its proprietary DPE (it is possible the DPE will determine no adjustment applies)
6. DPE sends Shopping RS to System
7. System receives RS and recalculates total
 - a. Charges based on percentage of fare are recalculated
 - b. Shopping/Pricing systems will apply all fare construction checks
8. System presents offers to customer

2.3 Booking and Ticketing

This section defines the Booking and Ticketing process for Solution A.

9. Customer selects an offer
10. System sends DPE Pricing RQ to DPE. The request includes the same DPE Input Criteria used for Shopping
11. DPE receives request and adjusts fare
12. DPE sends Pricing RS to System which includes DPE Output Criteria, as well as a Unique Identifier
13. DPE sends a copy of the Pricing RQ/RS (including Unique Identifier) to ATPCO's NDC Exchange for adjusted fare distribution
14. System receives response, books and tickets. The ticket reflects:
 - a. Fare Basis Code of the base fare
 - b. Adjusted amount
 - c. The Fare Calculation Pricing Indicator (FCPI) should indicate the fare is private.
15. ATPCO new fare distribution product:
 - a. Identifies the original base fare
 - b. Creates a new fare record (new distribution product) with the adjusted amount. The adjusted fare maintains all the fare related criteria as the base fare (same tariff, carrier, rule, footnote, and routing conditions), with the fare amount (adjusted amount) being the only difference.
 - c. Distributes the adjusted fare as a new private fare product. The new record includes:
 - i. Adjusted amount
 - ii. Original base fare amount
 - iii. Source code DPE (to distinguish it from existing, current fare products)

- iv. Unique Identifier (provided in the DPE pricing RS)
- v. Future Phase: Table pointing to original Point of Sale/Passenger information (provided in the DPE Pricing RQ)

16. Future Phase: (Ticketing) System sends a message to ATPCO's NDC Exchange with

- a. Ticket Number, linked to
- b. Unique Identifier

2.4 Revenue Accounting – Open Issues

Issue	Discussion Items//Action Plan
<p>Scope of Fares Included - Interline</p> <p>Current pilot does not address interline tickets (interline fares, interline marketing carriers participating on the fare, codeshare, validating carrier)</p>	<ul style="list-style-type: none"> • Requires industry discussion with revenue accounting experts • Interline settlement based on the applicable fare: Is this applied to the original base fare (not adjusted fare)? • Propose Pilot implementation

2.5 Proposed: New Fare Distribution Product (Adjusted Fares)

2.5.1 Overview

ATPCO will introduce a new fare distribution product to enable the adjusted fare to be distributed in a manner that supports the downline systems, post ticketing. In the initial phase this will be “private” data for downline systems only; in later phases this may change but only insofar as the fares are live, commercial fares available for sale. Even in the initial phase, downline processes, such as Revenue Accounting Settlement/Audit, Repricing and Revenue Management, require knowledge on all possible fares in the marketplace to have a comprehensive database of information to compare the sale/ticket information against.

This is an optional process for an airline. Some airlines may choose to implement a separate internal process for handling dynamically adjusted fares in revenue accounting processing

2.5.2 High-level Product Description

- **Aligned with Current Fare Subscription Products.** The record layouts and distribution are aligned as much as possible with the existing fare products for ease of implementation. ATPCO will distribute fare records (from a new database) using a modified version of the Passenger International Fare (PIT) record and the US/CA fare (PLF) product (refer to proposed record layouts provided later of this document).
- **DPE in Header and Source**
 - The new records will be identified as DPE in the header record in place of PIT or PLF
 - The Source Code will reflect DPE in place of ATP
 - This allows for the ability to differentiate the records as not for pricing and sale. It is recommended that the customer/subscriber separate this data as applicable only for Audit, Reprice and Settlement processes
- **Private Fare Distribution.** The dynamically adjusted fare will be a private fare and shared only with downline systems (i.e. not other airlines).

- **Only the Fare Amount is Adjusted.** The new fare product will retain (duplicate) the same Tariff, Carrier, Fare Class Code, Rule, Footnote, and Routing as the original base fare. Only the fare amount will be changed (adjusted per the DPE RS). No new rule data will be sent and the standard G16 will be used to point to the existing rule, routing and footnote data.
- **Point of Sale and Passenger Information.** Future Phase. A new table will point to the original point of sale and passenger information provided in the initial request to the DPE. This information will not be distributed as part of the ATPCO fare record but will be contained within the associated table. Any distribution of passenger information must consider any applicable privacy regulations. (Refer to the following section for further information.)
- **Unique Identifier.** The Unique Identifier (e.g. PricingID) provided in the DPE RS will be included on the new fare record. This can be used in post-sale processes as confirmation that the priced result was sold under the conditions stored for that unique condition
- **Constructed Fares.** Constructed fares that are adjusted by a DPE will be stored and distributed as a fully constructed fare and not as the separate parts (specified and add-ons.)
- **Fare by Rule.** Fare by Rule (FBR) fares that are adjusted by a DPE will be stored and distributed in a fare record format, but reflecting the FBR Tariff and Rule.
- **New ATPCO Database.** The records will be stored in a new ATPCO database. ATPCO will hold the fares data in the same tariff codes as the equivalent base fare data. These new DPE records will be held in a separate database and the rule data associated will be that of the original base fare (specified, constructed or fare by rule). Storing the DPE results in the tariff of the original base fare allows for all the conditional data (rule, footnote, routing/MPM) already associated to that tariff to be invoked without duplication. In other words, the new DPE result will apply all conditional data from the base fare that was adjusted. This new database will use the current/production G16 distribution criteria. Both the adjusted fare amount and the original fare amount associated to the DPE result will be stored (and distributed) as private data.
- **Distribution.** Distribution of the data will use the current Data Distribution and Subscription (DDS) control table the DDC. All subscribers listed as receiving public fare data would be positioned to receive the new fare product DPE data (pending airline instruction), and they can opt out using the current business functionality within DDS

- For international constructed fares, the product will include the fully constructed fare. This means that add-on records will not be sent in the new product, but the add-on data used will be reflected within the resulting constructed record which is sent as an international fare record.
- Change tags and other supplementary data will not be sent, and the data elements have been changed to Filler
- The subscription will be a fares file daily product reflecting the base fare amount and the adjusted dynamic fares (like child to parent) that are associated and were sold on a particular day with the table reference to their POS/Account/Passenger information. The records would have the original base fare Tariff/Carrier/Market/Fare Class and Rule, footnote, routing or MPM data, with the original fare amount with the adjusted fare amount.
- **Data Maintenance and Link Number.** Fare data distributed by ATPCO contains a link (control number) with a sequence number that increases when newer versions of the fare are created or as the fare is cancelled. The Link Number is a 3-digit field and the Sequence Number is 5 digits.
 - ATPCO proposes assigning a pseudo link and sequence to all records which will not be used for any data maintenance purposes.
 - Every record will contain the Unique Identifier assigned in the DPE RS.
 - For a tariff/carrier/market/fare class, each new fare will be a separate link. To follow the standard link and sequence processing, the records will be given their own link starting with 001. Each day the process will start again and use the link numbers. (Open Issue: Will the maximum of 999 link numbers be enough for a given day?) The associated sequence number will be 00001. ATPCO would reset the link and sequence usage every day and receiving systems who need to keep history will keep each link and sequence with the associated effective and discontinue date. The records must be kept independently, no down-dating or overlaying of any of the records should occur.
- **Effective and Discontinue Dates.** These dates reflect sale dates for the DPE fares.
 - Effective Date will be set as “today”, indicating the date the fare is sold. It is possible the Effective Date will be a past date (e.g. “yesterday” or earlier) in the event the sale information from the DPE is not received by ATPCO on the actual date of sale.

- Discontinue Date will be equal to the Effective Date and will have no application on the travel date.
- The assumption is that the adjusted fare was sold and the travel period was verified at the time of original pricing and using the base fare rule/footnote data. Currently, effective and discontinue dates reflect travel commencement dates (applied to the departure from the origin of the journey), but this is assumed to apply to the priced base data and not to the DPE data that is reflecting the day that adjusted fare was sold
- At the end of each day, all records will be considered canceled
- **Subscriber Impact.** The receiving subscription system can load these fares in a separate database that is only accessed if the fare is not found in their standard fare database. The query can use the same request information as for the standard fare retrieval and look for the ticketed amount in this alternative database. This process would be new and require development on the customer side, including but not limited to:
 - New database to store the DPE fare records and the associated table of conditions
 - New date logic process
 - Data loading would remain very similar to the standard process today. Records will be received with a discontinue date and could have the same link and sequence sent the following day, again with an effective and discontinue date. Both records must be stored.
 - Effective and Discontinue dates in a DPE record will not be used as the travel date window. It will be assumed that the pricing entry that was the basis for the DPE adjustment was valid for the travel period and had been processed in according with data application date logic
 - New retrieval process to compare the transaction in hand to the DPE database of fares by the amount and conditions, potentially using the unique ID as a cross-reference (future development).
 - New data elements and filler (as defined in the Record Layouts provided later in this document)

2.5.3 Point of Sale and Passenger Information

Future development will provide functionality to link the point of sale data with the adjusted fare.

The distribution process will include a new fare element that is the unique table identification of the associated data which is held and distributed outside the rules system. Any distribution of passenger information must consider any applicable privacy regulations.

Following is a list of elements tentatively identified (based on initial DPE RQ/RS specification):

- Point of Sale elements
 - Validating carrier
 - Distribution channel
 - Geographic location
 - IATA agency code
 - Pseudo city code
 - Office ID
 - Duty/function code
 - Department/Identifier
 - CRS/Cxr department code
 - ERSP number
 - LNIATA Number (CRT address)
- Passenger Elements
 - Passenger Type Code (PTC)
 - Frequent flyer number

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- Frequent flyer tier level
- Number of passengers traveling together
- Corporate ID
- Account Code
- Ticket Designator
- Nationality/Residency
- Government ID
- Tour Code

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FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATIONS
TAR NO	Tariff Number: A code indicating the tariff in which the record is applicable.	A	1 – 3	N	See "Data Subscription Services Master Appendices" document - Appendix H. NOTE: For Adjusted FBR Fares, this will be a FBR Tariff Number
CXR CD	Carrier Code: A standard industry alphanumeric code.	A	4 – 6	AN	Standard industry alpha or alphanumeric code.
ORIG	Origin City Information: <u>CITY</u> : Industry standard alpha code of the origin city, as defined in the IATA Airline Coding Directory. <u>CTRY</u> : Standard country code of origin country as defined in the Codes for the Representation of Names of Countries adopted by the International Standards Organization (ISO).	A A	7 – 11 12 – 13	A A	Three letter alpha code. (Fourth and fifth positions are reserved for future expansion.) See "Data Subscription Services Master Appendices" document - Appendix D.
DEST	Destination City Information: <u>CITY</u> : Industry standard alpha code of the destination city, as defined in the IATA Airline Coding Directory. <u>CTRY</u> : Standard country code of destination country as defined in the Codes for the Representation of Names of Countries adopted by the International Standards Organization (ISO).	A A	14 – 18 19 – 20	A A	Three letter alpha code. (Fourth and fifth positions are reserved for future expansion). See "Data Subscription Services Master Appendices" document - Appendix D.
FARE CLASS CD	Fare Class Code: The fare class code applicable to the fare.	A	21 – 28	AN	One to eight position alphanumeric codes

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATIONS
					NOTE: For Adjusted FBR Fares, this will be the Category 25 Resulting Fare Class Code
DATES	<u>EFF</u> : The date on which the fare is effective for travel on or after. <u>DISC</u> : The last date on which the record is effective either because: (a) the record has been superseded by a record within the link number. (b) the record has been cancelled by tariff ; or, (c) the record has been cancelled by an expired travel footnote connected to the fare.	W A	29 – 34 35 – 40	N N	This field will always contain zeros as ATPCO will not provide any data in this field. YYMMDD format
RULE NO	Rule Number: The rule number published in connection with the fare in the filed tariff or in some other identified source for non-filed fares.	A	41 – 44	N	Alphanumeric NOTE: For Adjusted FBR Fares, this will be the Category 25 Rule
RTG NO	Routing Number: The routing number or map number published with the fare. NOTE: In an unpublished (constructed) record, this is the routing number of the published fare.	A	45 – 48	N	Routing numbers in ATPCO tariffs are all numerics. 0000 - means Maximum Permitted Mileage applies. NOTE: For Adjusted FBR Fares, this will be the Routing Number provided to/from DPE
OW/RT	One-Way/Round-Trip Indicator: Indicator to identify whether fare is one-way or round-trip.	A	49	N	1 - One-way fare, which may be doubled to obtain a round trip fare.

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATIONS
					2 - Round-trip/circle-trip fare which cannot be halved to obtain a one-way fare. 3 - One-way fare which may not be doubled to obtain a round-trip fare.
SOURCE	Source of Data: Indicates the airline's Dynamic Pricing Engine (DPE) is the data source	A	50 – 53	A	Always "DPE" left justified.
FARE INFORMATION	Fare Information: The applicable fare values. At present, only two fare fields are used for each record. ADJUSTED: FARE AMOUNT: Adjusted fare amount.	W	54 – 64	N	Always numeric. A zero fare is a valid fare amount and will also continue to represent a cancelled fare.
	CUR CD: Currency code of the adjusted fare.	W	65 – 67	N	See "Data Subscription Services Master Appendices" document - Appendix D. Edits require this be the same as the Original Base Fare Currency (bytes 95-97)
	# DEC: The number of decimal places to be applied to the adjusted fare amount.	W	68	N	0-9
	FILLER ORIGINAL BASE FARE: FARE AMOUNT: Original base fare amount.		69 – 83 84 – 94		Always numeric. A zero fare is a valid fare amount and will also continue to represent a cancelled fare

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATIONS																
	CUR CD: Currency code of the base fare.	W	95 – 97	N	See "Data Subscription Services Master Appendices" document - Appendix D. Edits require this be the same as the Adjusted Fare Currency (bytes 65-67)																
	#DEC: The number of decimal places to be applied to the base fare amount.	W	98	N	0-9.																
FILLER	FILLER		99-108																		
FTNT	Fare Footnote: The footnote associated with the fare. NOTE: The "F" directional footnote will not be held in this field. Directional "F" footnote will only be represented in the Directional Indicator field (LOC 111).	W	109 – 110	AN	Alphanumeric A single footnote consists of one alpha, one numeric, a double numeric, or a numeric alpha. Two footnotes consist of double alphas or an alpha numeric; double alphas of the same letter will not be used. Examples: <table border="1"> <thead> <tr> <th>Subs</th> <th>Footnote</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>A - a single footnote</td> </tr> <tr> <td>1</td> <td>1 - a single footnote</td> </tr> <tr> <td>11</td> <td>11 - a single footnote</td> </tr> <tr> <td>1A</td> <td>1A - a single footnote</td> </tr> <tr> <td>A1</td> <td>A and 1 - two footnotes</td> </tr> <tr> <td>AB</td> <td>A and B - two footnotes</td> </tr> <tr> <td>AA</td> <td>not applicable</td> </tr> </tbody> </table> NOTE: For Adjusted FBR Fares, this will be blank	Subs	Footnote	A	A - a single footnote	1	1 - a single footnote	11	11 - a single footnote	1A	1A - a single footnote	A1	A and 1 - two footnotes	AB	A and B - two footnotes	AA	not applicable
Subs	Footnote																				
A	A - a single footnote																				
1	1 - a single footnote																				
11	11 - a single footnote																				
1A	1A - a single footnote																				
A1	A and 1 - two footnotes																				
AB	A and B - two footnotes																				
AA	not applicable																				
DI	Directional Indicator: Indicator specifying the applicable direction of the fare.	A	111	A	Always F – From origin city.																

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATIONS
GLOBAL	Global Indicator: The global routing applicable to the fare.	A	112 – 113	A	See "Data Subscription Services Master Appendices" document - Appendix J.
TAR EFF DATE	Tariff Effective Date: The date on which the fare is to become available for travel unless further modified by a footnote.	A	114 – 119	N	YYMMDD Format
MPM	Maximum Permitted Mileage: The maximum permitted mileage for the city pair (whether applicable or not).	A	120 – 124	N	00000 – 99999
FILLER	FILLER		125		
ORIGIN ADD-ON INFORMATION	Origin Add-On Information: Data relating to the origin add-on used in construction. (These fields are not populated for published fares.) FARE CLASS CD: RTG: FTNT:	W W W	126 – 133 134 – 137 138 – 140	AN N AN	Alphanumeric code 0000 – 9999 Alphanumeric A single footnote consists of one alpha, one numeric, a double numeric, or a numeric alpha. Two footnotes consist of double alphas or an alpha numeric; double alphas of the same letter will not be used. See bytes 109-110 for examples.

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATIONS
	GATEWAY:	W	141 – 145	A	Standard industry three-character code (fourth and fifth positions reserved for future expansion).
FILLER	FILLER		146 – 161		
DESTINATION ADD-ON INFORM ATION	Destination Add-On Information: Data relating to the destination add-on used in construction. (These fields are not populated for published fares.)				
	FARE CLASS CD:	W	162 – 169	AN	Alphanumeric code
	RTG:	W	170 – 173	N	0000 – 9999
	FTNT:	W	174 – 176	AN	Alphanumeric A single footnote consists of one alpha, one numeric, a double numeric, or a numeric alpha. Two footnotes consist of double alphas or an alpha numeric; double alphas of the same letter will not be used. See bytes 109-110 for examples.
	GATEWAY:	W	177 – 181	A	Standard industry three-character code (fourth and fifth positions reserved for future expansion).
FILLER	FILLER		182 – 227		

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATIONS
ACTION	Processing Action Code: A code indicating the type of action to be taken in connection with the processing.	A	228	A	I – Insert the record. No other records for the tariff, carrier, market, fare class and link number exist in the previous file. R – Replace the records for the tariff, carrier, market, fare class and link number in the previous file with the record(s) being transmitted.
FILLER	FILLER		229-246		
LINK	<p>Link and Sequence No.:</p> <p><u>NO</u>: A number assigned to each unique record within tariff, carrier, market and fare class (e.g., if fares are published via different routing numbers or footnotes, they are assigned different link numbers). Successive records produced by ATPCO file maintenance (e.g., changed fares, changed footnotes, changed routing numbers), have the same link number as the original record.</p> <p><u>NOTE</u>: At times, tariff processing may involve the cancellation of a record and its re-addition with revised data. This type of maintenance may result in a new link number if ATPCO had purged the previously cancelled record</p>	A	247 – 249	N	001 – 999

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATIONS
	SEQ: A number indicating the sequence of the record within a link number.	A	250 – 254	N	00001 – 99999
FILLER	FILLER		255-284		
ADJ ID	ADJUSTMENT ID: A unique identifier (key) assigned by an airline's Dynamic Pricing Engine (DPE) to identify the pricing adjustment.	A	285-314	AN	Up to 30 Alphanumeric (left justified followed by blank)
PSGR/POS TBL	Passenger/Point of Sale: A table containing the passenger and point of sale parameters on the DPE input request applicable to the adjusted fare	A	315-322	N	00000000-99999999
FILLER	FILLER		323-342		

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2.5.5 DPE US/CA Domestic Fare Record Layouts and Descriptions

ATPCO RECORD LAYOUT																					
RECORD NAME											SYSTEM										
DPE U.S./CA FARES DATA SUBSCRIPTION RECORD											US/CA FARES DATA SUBSCRIPTIONS										Jan-17
LOCATION	DATA FORMAT																				
T A R N O	C X R C D	CITY		FARE CLASS CODE	DATES		R U L E N O	R T G M A P N O	O W / R T	S O U R C E	ADJUSTED FARE		F T N T	F I L L E R	A C T I O N	F I L L E R	L I N K N O	S E Q N O	F I L L E R		
		ORIG	DEST		EFF	DISC					FARE VALUE	CUR								DETC	
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95		
FILLER		Codes ORIG DEST		FILLER		New Field ORIGINAL BASE FARE		FARE VALUE		C U R D E T C		New Field UNIQUE IDENTIFIER				New Field PSGR/POS TABLE	New Field FILLER				
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95		
New Field FILLER (cont)																					
		10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95		
TITLE	DESCRIPTION										TITLE	DESCRIPTION									
	RECORD LENGTH = 211 BYTES																				

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATION
TAR NO	Tariff Number: Identification of a specific group of fares based on criteria such as geographic area, fare type, etc.	A	1-3	N	Refer to Automated Rules Appendices; Tariff Matrix (Appendix H) NOTE: For Adjusted FBR Fares, this will be a FBR Tariff Number
CXR CD	Carrier Code: Standard industry alpha or alphanumeric carrier code as defined in the IATA Airline Coding Directory.	A	4-6	AN	Two or three position carrier code. (Two position carrier codes are left justified.)
CITY	City Codes: Industry standard alpha city codes as defined in the IATA Airline Coding Directory <u>ORIG</u> : Origin City <u>DEST</u> : Destination City	A A	7-11 12-16	A A	Three-letter alpha codes. (Fourth and fifth positions are reserved for expansion.)
FARE CLASS CD	Fare Class Code: The class code applicable to the fare.	A	17-24	AN	One to eight position alphanumeric codes. NOTE: For Adjusted FBR Fares, this will be the Category 25 Resulting Fare Class Code
DATES	<u>EFF</u> : The effective date of the record <u>DISC</u> : The last date on which record is effective.	A W	25-30 31-36	N N	YYMMDD format YYMMDD format 999999 - Open date
RULE NO	<u>Rule Number: The rule number published in connection with the fare.</u>	A	37-40	AN	Alphanumeric NOTE: For Adjusted FBR Fares, this will be the Category 25 Rule
RTG MAP NO	<u>Routing Number: The routing number or map number published with the fare.</u>	A	41-44	N	0001-0999 Note: 999 is highest permissible routing number with FareManager Fares system. NOTE: For Adjusted FBR Fares, this will be the Routing Number provided to/from DPE

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATION
OW/RT	One-Way/Round-Trip Indicator: Indicator to identify whether a fare is one-way or round-trip.	A	45	N	<p>“1” - One-Way Fare which may be doubled to obtain a round trip fare.</p> <p>“2” - Round-Trip Fare/circle-trip fare which cannot be halved to obtain a one-way fare.</p>
SOURCE	Source Of Data: Indicates the airline's Dynamic Pricing Engine (DPE) is the data source	A	46-49	AN	Always “DPE” left justified.
ADJUSTED FARE	<p>Fare Value: The fare value published in USD or CAD currency.</p> <p>Currency Code: The currency code applicable to the fare as defined by IATA Resolution 024d.</p> <p>Decimal: Number of decimal places applicable to the fare value.</p>	<p>A</p> <p>A</p> <p>A</p>	<p>50-60</p> <p>61-63</p> <p>64</p>	<p>N</p> <p>A</p> <p>N</p>	<p>DDDDCC format</p> <p>“USD” - U.S. Currency “CAD” - Canadian Currency Edits require this be the same as the Original Base Fare Currency (bytes 150-152)</p> <p>Always “2”.</p>
FTNT	Footnote: The footnote(s) associated with the fare.	W	65-66	AN	<p>A single footnote consists of one alpha, one numeric, a double numeric, or a numeric alpha.</p> <p>Two footnotes consist of double alphas or an alpha numeric; double alphas of the same letter will not be used.</p> <p>examples: <u>subs Footnote</u> A A - a single footnote</p>

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATION
					1 1 - a single footnote 11 11 - a single footnote 1A 1A - a single footnote A1 A and 1 - two footnotes AB A and B - two footnotes AA not applicable NOTE: For Adjusted FBR Fares, this will be blank
FILLER	Reserved for future use.	A	67-71		Spaces
ACTION	Processing Action Code: A code indicating the type of processing action to be taken in connection with the transaction.	A	72	N	1 - Cancel (Delete) 2 - Add (New) 3 - Update (Change)
FILLER	FILLER		73-81		
LINK NO	Link Number: A number assigned to each unique record within tariff, carrier, market and fare class. Successive records produced by file maintenance (e.g., changed fares, changed footnotes, changed routing numbers), have the same link number as the original record. A new link is assigned to changes involving tariff number, carrier code, market codes or fare class codes. NOTE: At times, tariff processing may involve the cancellation of a record and its re-addition with revised	A	82-84	N	001 - 999

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATION
	data. This type maintenance results in a new link number.				
SEQ NO	Sequence Number: A number indicating the sequence of the record within a link number. Each successive revision to a record contains a higher sequence number than the previous record. Due to processing however, there may be gaps in subscribers' files (e.g., sequence 1, 2, 3, 5).	A	85-89	N	00001 - 99999
FILLER	FILLER		90-120		
Geographic Codes	Codes: The ATPCO geographic codes and the state/province codes of the cities between which the fare is published. <u>ORIG</u> : G: Geographic T: State <u>DEST</u> : G: Geographic T: State	I I I I	121-122 123-124 125-126 127-128	N N N N	ATPCO Geographic Codes: 01 - Continental U.S. 02 – Canada 04 – Hawaii 08 – Alaska Please refer to Automated Rules - Appendix E (States/Provinces) for a complete listing of the valid 2 position numeric State/Province codes.
FILLER	FILLER		129-138		

FIELD	DESCRIPTION	AVAIL	LOC	REP	SPECIFICATION
ORIGINAL BASE FARE	Fare Value: The fare value published in USD or CAD currency.	A	139-149	N	DDDDCC format
	Currency Code: The currency code applicable to the fare as defined by IATA Resolution 024d.	A	150-152	A	"USD" - U.S. Currency "CAD" - Canadian Currency Edits require this be the same as the Original Base Fare Currency (bytes 61-63)
	Decimal: Number of decimal places applicable to the fare value.	A	153	N	Always "2".
ADJUSTMENT ID	ADJUSTMENT ID: A unique identifier (key) assigned by an airline's Dynamic Pricing Engine (DPE) to identify the pricing adjustment.	A	154-183	AN	Up to 30 Alphanumeric (left justified followed by blank)
PSGR/POS TBL	Passenger/Point of Sale: A table containing the passenger and point of sale parameters on the DPE input request applicable to the adjusted fare	A	184-191	N	00000000-99999999
FILLER	FILLER		192-211		

Availability Codes	Representation Codes:
<p>A - Always Included</p> <p>I - Included when necessary to modify the application of other data in the record.</p> <p>W - Included when applicable.</p>	<p>A – Alpha (Spaces)</p> <p>AN – Alphanumeric (Spaces)</p> <p>N – Numeric (Zeros)</p>

DAF Distribution Product

Confirmation that ATPCO fare distribution product fulfills requirements for **Revenue Accounting**

- Solution supports revenue accounting requirements as discussed at the previous working group; however, a full review/verification is requested of revenue accounting experts.
- Requires revenue accounting systems to process new ATPCO fare product
- Addition of point of sale data (new table) to expand auditing functionality
- Pilot implementation

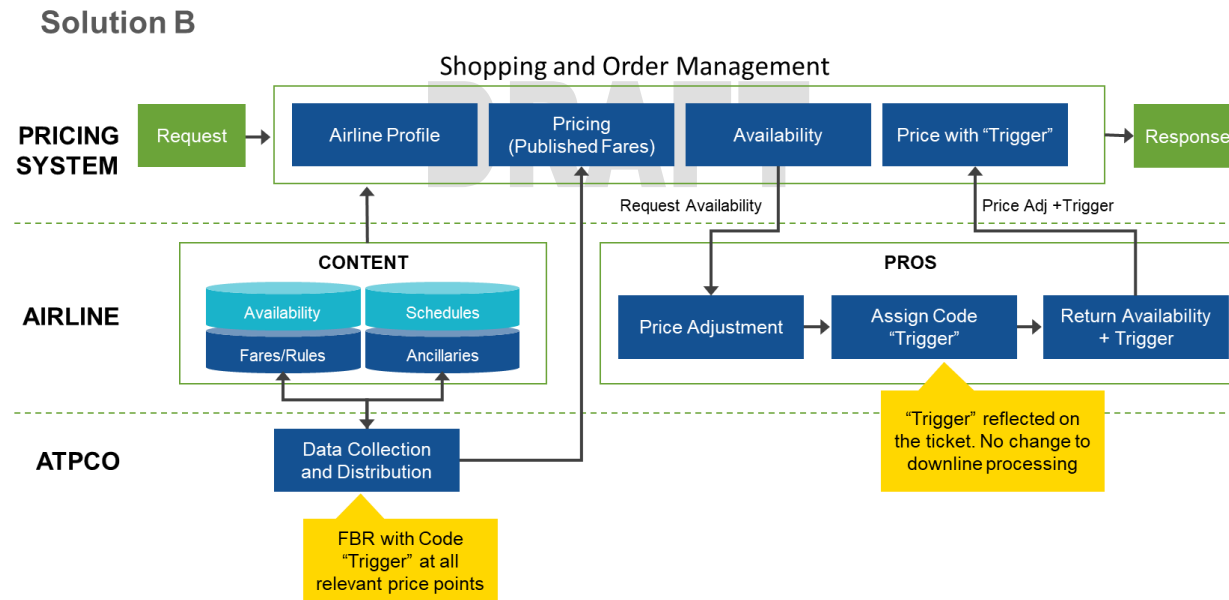
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3 Solution B: DPE with FBR Trigger

This solution for Dynamic Fare Adjustment utilizes current industry Fare by Rule capabilities to provide an implementation mechanism that allows dynamically adjusted fares to be supported throughout the collection, data distribution, and revenue accounting processes.

There are no changes to ATPCO records and processing. The DPE will return a Trigger (account code) which will in turn be used by the shopping/pricing systems to process ATPCO fare and related data. There are no changes to how the ATPCO data is processed.

3.1 High Level Processing Flow



3.1.1 In Scope

- **Online Fare Owning Carrier.** Only journeys consisting of fares with the same fare owning carrier are supported for the initial solution. The fares may contain online or interline travel within the fare component (including codeshare) but must be the same fare owning carrier. Interline pricing solutions are an open issue. It is anticipated that interline fare combinations may require aligned account codes (e.g. alliances).

3.1.2 Out of Scope

The following are out of scope for the initial implementation:

- Interline fare combinations.
- Dynamic adjustments to Total Fare

3.2 Shopping

1. Internet Booking Engine (IBE) determines whether to send request for Dynamic Pricing via Airline Profile
2. If indicated, IBE sends request to the Airline.
3. Airline's Shopping Product receives requests and sends request to DPE/Availability system
4. The DPE/Availability Box determines availability, and whether a Dynamic Price is desired, and if so, that Dynamic Price (based on its independent business logic)
 - a. Dynamic Prices may only be required under certain situations
 - b. The DPE determines the account code.
 - c. The DPE/Availability Box are expected to be the same thing. Thus, a single request to the RM system is required to obtain both availability and DPE response
5. The DPE/Availability Box sends message back to Shopping Product

- a. Message includes the Account Code (trigger) and the booking class (RBD) to which the Account Code should be applied
6. The Shopping Product then prices the itinerary based upon the provided Account Code, the availability, and the RBD.
 - a. This is when a Fare Basis Code (FBC) is identified.
 - b. For each itinerary in the O&Ds requested there would be a FBC (and RBD) and price, some of which have been discounted/marked up and some which may not have been.
7. The Shopping Product passes this final price back to the IBE to present to the Consumer
 - a. This final message may include both dynamically adjusted prices and standard prices due to multiple O&Ds in itinerary and/or due to providing multiple RBDs back to the customer (fare families/branded fares) and/or varying RBDs per itinerary.
8. The message type should be the same as today or it could be an NDC compliant message.

3.3 Booking and Ticketing

Booking

Open issue: Once a Consumer selects a flight, i.e. at the time of booking or selling, there would be an availability check, as is done today, but the intention is the dynamic price would not be recalculated. The discount code provided is assumed to remain valid. This process is an open issue pending Pilot results.

Ticketing

No change to current processes. Systems will reflect the Account Code (or not) as done today (e.g. in the PNR)

3.4 Revenue Accounting

No change to current processes.