
From: Sue Carter
Sent: Friday, May 19, 2017 1:13 PM
To: Jim Davidson;Vernon Blanson
Cc: Tim Reiz
Subject: FW: ACES PSS Doc
Attachments: FLX Airline Commerce Enterprise System v3 - White Paper Clean.docx

This time with Vernon.

From: Sue Carter
Sent: Friday, May 19, 2017 1:12 PM
To: Jim Davidson <jdavidson@farelogix.com>
Cc: Tim Reiz <treiz@farelogix.com>
Subject: RE: ACES PSS Doc

This is the latest I have. We should port over to new format before sending – Vernon could you convert this to current document template? Jim when do you need it?

Thanks

From: Jim Davidson
Sent: Friday, May 19, 2017 12:29 PM
To: Sue Carter <scarter@farelogix.com>
Cc: Tim Reiz <treiz@farelogix.com>
Subject: ACES PSS Doc

Can you send me the most recent ACES PSS document. Thx

James K. Davidson
CEO and President



Farelogix Inc.
760 NW 107th Ave, Suite 300 Miami, FL 33172
T 305-222-5401 C 630-865-3997 F 305-552-1436



FAAC



iflybags

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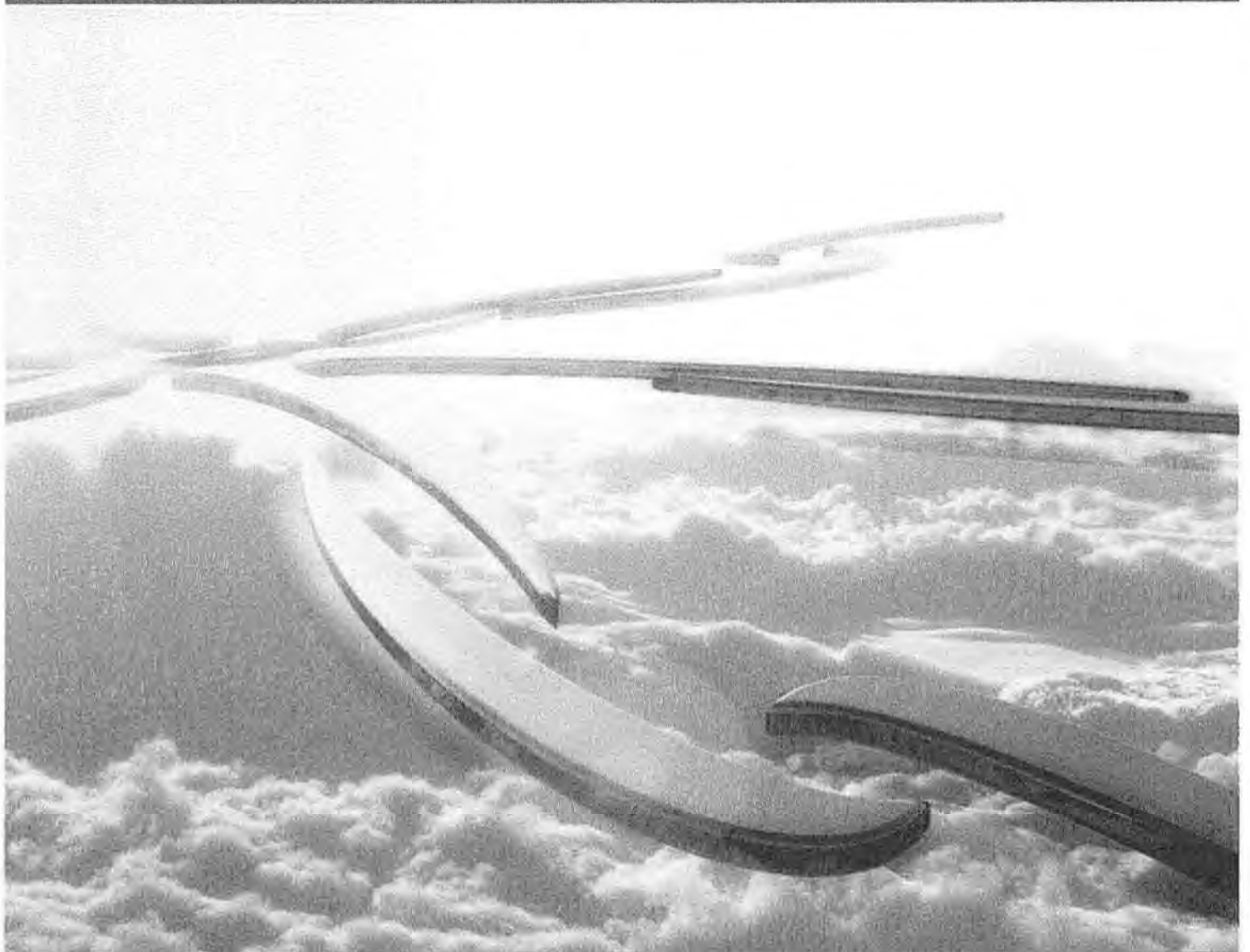
Airline Commerce Enterprise System

FLX-ACES White Paper

March 2017

Author: Tim Reiz

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I. BACKGROUND

Farelogix is a technology provider with innovative solutions for airline commerce and distribution. Farelogix has developed many software components that would be an integral part of a re-designed and modernized Airline Computer Reservations System ("CRS") (traditionally referred to as Passenger Services System ("PSS")). Farelogix is evaluating the further development and marketing of an Airline Commerce Enterprise System ("ACES") that would, over time, replace these legacy systems, in conjunction with an airline partner or group of airlines.

II. BUSINESS CASE

Currently the competitive landscape for the traditional airline PSS systems is limited. The market is dominated by two providers, Amadeus and Sabre, with steady growing market share for each. Amadeus and Sabre are also the two largest GDS providers, with a high degree of control over travel agency distribution, an essential airline sales channel. As a result of dominance in both PSS and GDS markets, Amadeus and Sabre have little incentive to innovate their legacy technology to meet changing airline requirements. Furthermore, they are able to leverage their control over their PSS to protect or compensate for decreasing GDS revenue. All of this has a negative impact on airlines in the following ways:

- Excessive scan and polling charges for airlines and 3rd parties accessing the system
- Higher cost of operations due to dated technology that drives up costs for servicing, maintenance and enhancements, including additional charges for shopping, pricing, excessive queries, ticketing and other services
- Potential claims to ownership of customer and booking data
- Potential erecting of roadblocks to airline controlled sales and distribution initiatives commercially and technically
- Forced Community Model with enhancement priorities driven by largest customers, and/or the interest of the PSS, or worse, used to deter innovation
- Erecting roadblocks to 3rd party access and integration to support new airline functionality

Navitaire, the main Low Cost Carrier PSS provider, was acquired by Amadeus in 2015. Other PSS providers such as HP, SITA and UNISYS have not played a significant role in the market recently and are experiencing shrinking market share. The increasing market share of Sabre and Amadeus naturally leads more airlines to seek a more neutral, modern, and airline-centric PSS solution. Furthermore, airlines are seeking a solution that is based on the IATA One Order initiative with support for new online retail and e-commerce business models and customer engagement strategies.

An independent and airline-influenced solution would allow airlines to take back control and ownership of their inventory, distribution and technology, and integrate with emerging solutions,

including but not limited to current and future Farelogix products. In other words, enabling the airlines to realize a new state of Total Content Control (TCC) – a required state for any airline that wants to maximize revenue generation, product differentiation, and brand loyalty.

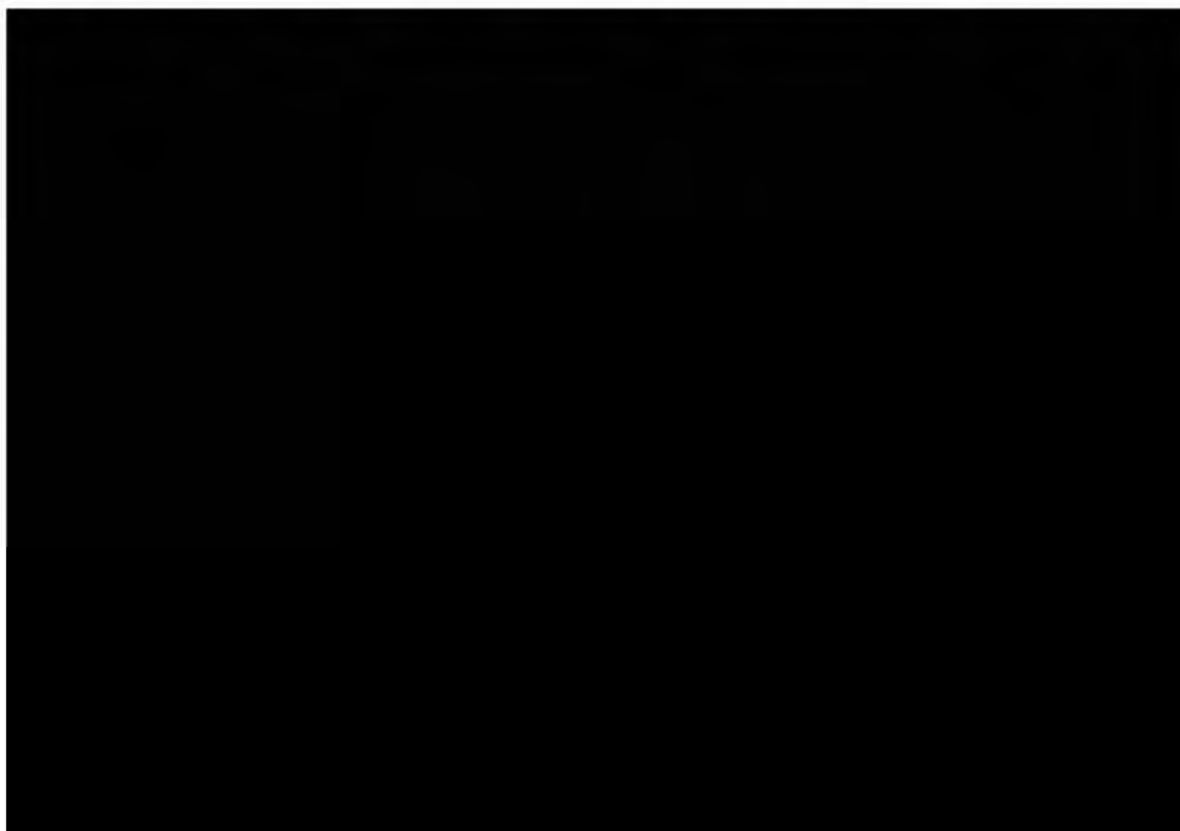
There are two major challenges to this project:

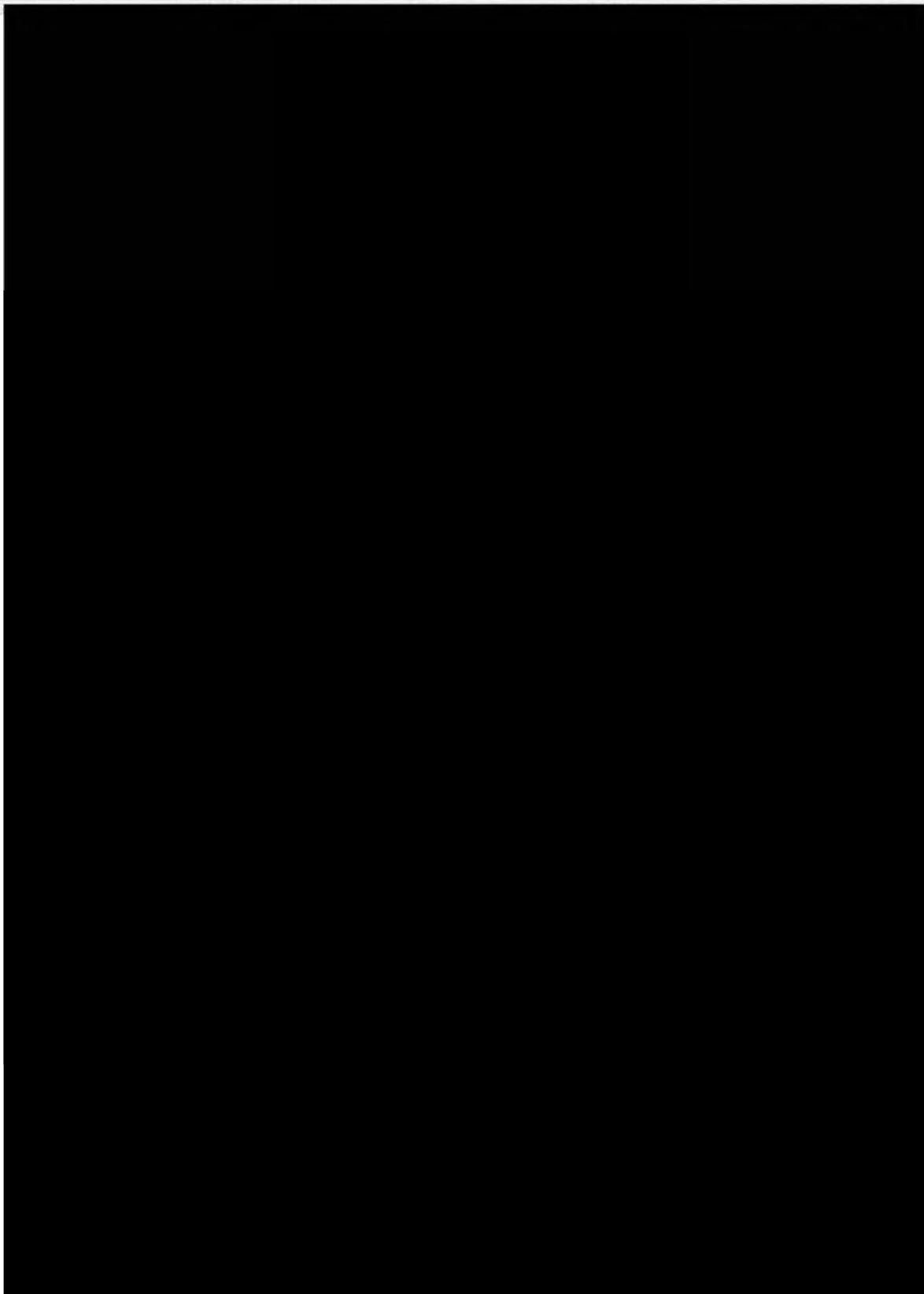
1. Airlines are locked into long term agreements for their PSS, so the immediate market opportunity may be small initially but increases over time.
2. The process of a migration to a new system is usually costly for an airline, with some significant operational risks. That said, Farelogix believes a migration to ACES can be managed through an efficient and low-risk process.

III. PROPOSED SOLUTION

1. INTRODUCTION

In Farelogix' view a comprehensive airline commerce system consists of the following components:







The following sections further explain the components and the proposed ACES solution.

■ [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

3. NDC OFFER AND ORDER MANAGEMENT/ IATA ONE ORDER

NDC (New Distribution Capability) is a new data format standard governed by IATA that will enable the travel industry to transform the way air products are retailed to corporations, leisure and business travelers, by addressing the industry's current distribution limitations: product differentiation, personalization and time-to-market, access to full and rich air content and finally, transparent shopping experience. In the NDC world, the selected Offer from a shopping result is directly converted into an Order. NDC Offer and Order Management address the reservation process from search through booking.

One Order is a separate IATA concept of a single Customer Order record, holding all data elements obtained and required for order fulfilment across the air travel cycle - such as customer data, order items, payment and billing information, fulfilment data and status.

Farelogix is currently enhancing the █████ product to fully support NDC Offer and Order management, with a seamless integration of legacy PNRs. In addition, Farelogix believes the One Order concept is the next step for airline efficiency and as such, the company is actively involved in the development of emerging One Order standards.

4. NDC DISTRIBUTION

The Farelogix FLX-DM (Distribution Manager) manages multiple sources and interline itineraries. Both shopping aggregation and multi-source booking management are supported for the entire functionality around creating and servicing a reservation. Furthermore, FLX offers an NDC XML API for distribution to any airline sales channel or touchpoint. Currently Farelogix is certified by IATA on NDC at Level 3, and is also in production with a number of airlines at Level 2.

5. LEGACY DISTRIBUTION AND COMMUNICATIONS

Farelogix believes the ACES solution will need to be integrated with current distribution channels and partner carriers using legacy communications, data protocols and work flows, at least for the near future. These are typically defined by IATA PADIS Type-A and AIRIMP Type-B standards. The Farelogix software is already integrated with every major host PSS and supports most of these standards related to reservations.

6. DYNAMIC SHOPPING AND PRICING

FLX Shop & Price is a state-of-the-art airline offer and pricing engine for comprehensive handling of pricing and faring requirements. FLX Shop & Price is designed to meet the emerging requirements of an NDC-aligned shopping experience, yet is compatible with the current shopping processes in place today. This includes managing and processing any combination of published fares from ATPCO, private fares, and pricing/merchandising/ancillary offers generated directly by the airline, and true dynamic and personalized fares/offers. The solution is highly scalable and designed to support high volume searches in support of new NDC-based concepts – affinity and attribute-based shopping as well as extended calendar-based shopping. Also, currently in development is a patent pending NDC-compliant offer management component with dynamic and personalized price guarantees.

7. MERCHANDISING, RULES MANAGEMENT, AND DYNAMIC BUNDLING

FLX Merchandise (FLX-M) is a highly flexible and efficient merchandising and retailing solution from Farelogix that puts airlines squarely in control of how their product is differentiated and branded in terms of ancillary services and flight merchandising. This solution supports retailing and personalization across multiple sales channels, including airline.com, mobile, check-in kiosks, call centers, and travel agencies (direct or via GDS). FLX Merchandise takes personalization and merchandising to new heights. The system's limitless choices of products, attributes, and dynamic business rules enable airlines to design and communicate targeted offers to customers with unprecedented flexibility and speed to market. FLX-M offers can be dynamically bundled with fares from FLX Shop & Price. Also included with FLX-M is a sophisticated baggage allowance and fee calculator, as well as an integrated inventory system for inventory controlled perishable ancillary services.

FLX-M is also a robust airline developer tool with a broad-range of operational and business process application. Also see Loyalty Programs section below.

8. E-TICKETING (ETKT AND EMD)

Even though IATA's long term One Order vision is a ticketless purchase process, E-Ticketing support will still be relevant and required for years to come. FLX Docs is a Farelogix solution providing airlines full flexibility to ticket, settle, and report each transaction that today handles e-ticketing and ticketless carriers and is certified for both ARC and BSP. Farelogix, which supports both EMD-A and EMD-S documents, is an industry leader with BSP certification for EMDs in over 100 markets. In addition, the system can handle all standard reporting methods, including ARC SPRF, BSP RET, TCN, HOT, and CAT. The solution is unique in its cross-channel flexibility, giving the airline control of its method for ticketing, settlement and reporting for each channel.

9. DYNAMIC SCHEDULES AND AVAILABILITY

NDC distribution will require airlines to take control and manage large volumes of shopping requests, which are steadily increasing due to NDC affinity, calendar, and mobile shopping, and for re-booking and "what if" scenario shopping. Farelogix has just completed the development of a new highly scalable dynamic schedule builder (FLX Schedule Builder) that meets these requirements. Airline availability for these schedules is designed as plug-in driver (FLX Availability Calculator). The Farelogix Schedule Builder and Availability Calculator are part of the FLX Inventory component and are tightly integrated with FLX Shop & Price and FLX-M. The integration with FLX-M allows incorporating Bid-Prices directly into the dynamic bundling process and bypass RBD-based ATPCO pricing.

10. SEATING

The seat management system allows the airline to configure seating charts and occupation for different aircraft types and configuration, and manage the allocation and seating by flight. Farelogix

[REDACTED]

11. INVENTORY

The system contains all the airline's flights and the available seats. The main function of the inventory system is to define and track how many seats are available on a particular flight by opening or closing an individual booking class in accordance with rules defined by the airline.

[REDACTED]

12. DEPARTURE CONTROL (CHECK-IN, BOARDING)

The departure control system is the system used by airlines and airports to check-in a passenger. The DCS is connected to the reservation system, enabling it to check whether a passenger has a valid reservation on a flight. The DCS is used to enter information required by customs or border security agencies and to issue the boarding document. In addition, the DCS may also be used to dispatch baggage, cargo and to optimize aircraft weight and balance.

[REDACTED]

13. LOYALTY PROGRAMS

The FLX-M product contains advanced functionality for Redemption and Award calculation across multiple loyalty programs, related to both fares and ancillaries. Farelogix has developed the entire back end for a major North American carrier's 'Rewards for Business' program. Most of the components can be used to build out a robust Frequent Flyer program system. In fact, another major North American carrier has used FLX-M as a developer tool to integrate the system completely with the airline's internal loyalty and redemption solutions.

14. CRM

[REDACTED]

15. AIRLINE CALL-CENTER APPLICATION FOR SERVICING

The Airline customer service center will require a graphical user interface to service bookings. Today, the Farelogix SPRK user interface web application covers the entire functionality for shopping, booking, ticketing, exchanges and refunds, including support for group bookings and traveler split. SPRK is in use by thousands of travel agencies today around the world, and can be easily modified and branded for airline call center applications.

16. AIRLINE.COM WHITE LABEL WEB AND MOBILE APPLICATION

Farelogix is currently partnering with [REDACTED] for building white label airline applications – including web and mobile--that are fully integrated with Farelogix systems.

17. WEB SITE CONTENT MANAGEMENT

[REDACTED]

18. IRREGULAR OPERATIONS / REBOOKING

Flight delays and cancellations may require the customer to be rebooked or accommodated. Such a

[REDACTED]

19. REVENUE MANAGEMENT

[REDACTED] Airline offers are becoming more customer centric and revenues are increasingly driven by bundles and ancillaries which add significantly to an airlines bottom line. This requires new methods of demand

forecasting based using Big Data and application of dynamic pricing. The Farelogix Shopping and Merchandising products provide a solid foundation.

20. REVENUE ACCOUNTING

[REDACTED] but the system should easily integrate with 3rd party software specialized on revenue accounting and finance. The Farelogix Shop & Price and FLX Merchandise products provide fully itemized details including taxes and fees which can be used for real-time revenue tracking. FLX Merchandise also provides an airline pro-rate calculation feature that follows IATA standards or custom airline alliance and JV relationships. However, many of the complexities that exist today are expected to be removed with One Order implementations.

21. PARTNER MANAGEMENT

All of Farelogix existing software has been designed to support Interline and Codeshare relationships, which can be managed and configured using sophisticated tools and rules processors. Integration with partner loyalty programs and alliance/JV compliance will require some new development. NDC participating/offering airline concepts will be covered through current NDC related Farelogix development.

22. OTHER REQUIREMENTS

The ACES shall be [REDACTED]

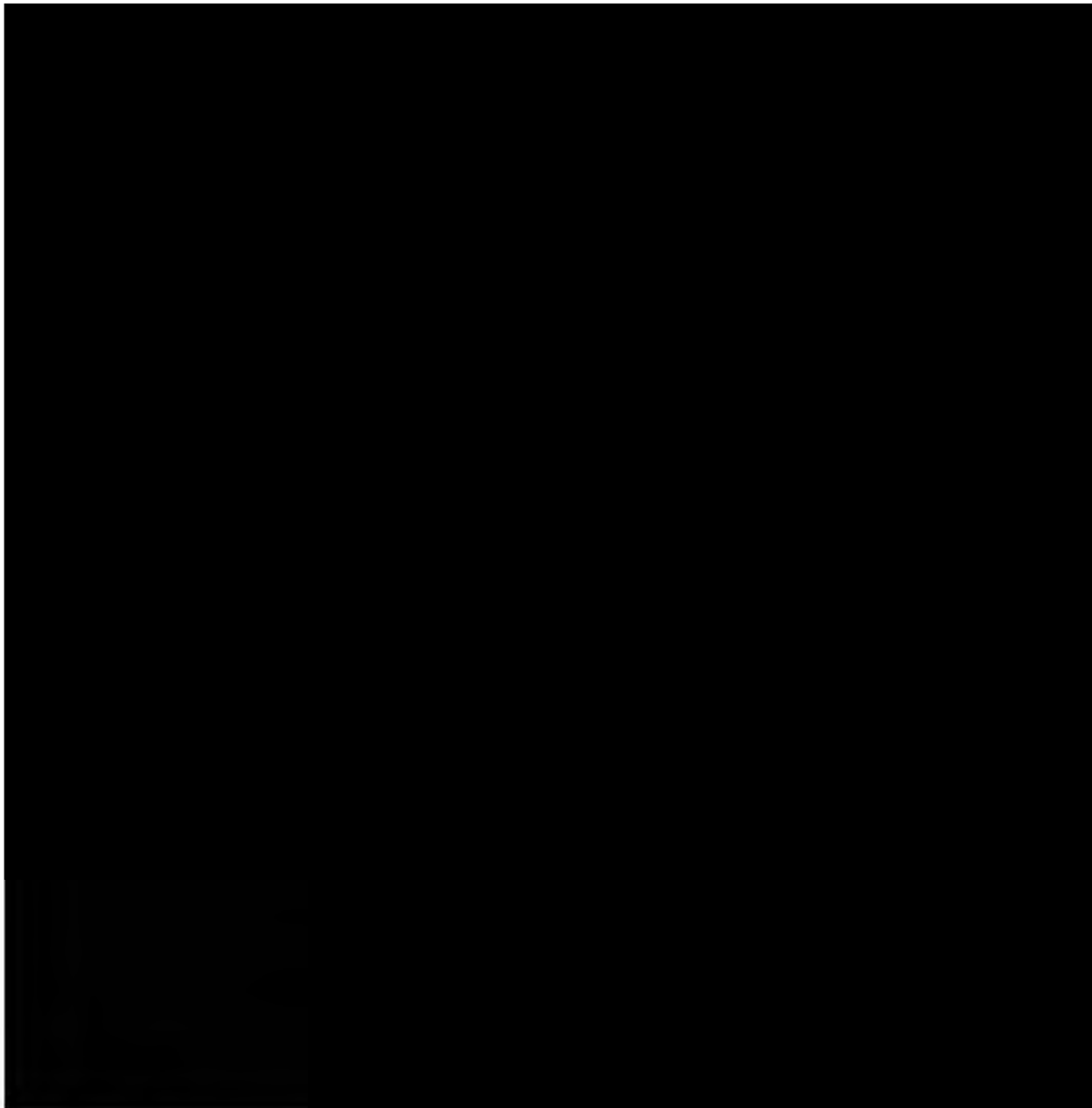
[REDACTED]

The system should facilitate a smooth migration [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



V. CONCLUSION

Farelogix owns a significant amount of intellectual property that would be required for building out the Airline Digital Commerce System. Such a system would help Farelogix and the airline community as a whole to overcome barriers created by existing PSS/GDS providers for implementing a modern airline retail solution.

