Oracle Airline Data Model

Business Overview Presentation
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Presentation Overview

• Airline Industry Perspective
• Passenger Data Management
  • Exadata Intelligent Data Warehouse for Airlines
  • Oracle Airline Data Model
• Oracle Airline Data Model Components
• Why Oracle Airline Data Model
• Summary
Enhancing the Customer Experience is the Top Priority For Airlines

Top Airline Priorities for 2011

- Improving the customer experience: 86.7%
- Increasing revenue from the sale of ancillary products: 56.7%
- Increasing revenue from selling more tickets (of the core product): 60.0%
- Reducing the miles/point liability: 23.3%
- Reducing the cost of providing customer support: 36.7%

Progress Made on Top Priorities

- Yes but we have not yet implemented any...: 26.7%
- Yes but we have identified the touchpoints: 50.0%
- No but we are planning to: 23.3%
- No and we don't plan to: 0.0%

Source: Airline Information Survey 2011

• Improving the customer experience is the key focus for airlines as they track data to understand customer segments and preferences while looking for ways to add value beyond the customer journey.
• Airlines want to improve the customer experience, but this is still very much a work in progress as airlines work to identify touchpoints, identify improvements, and implement their improvements.
• Passenger data will play a central role in enhancing the customer experience --- to personalize and differentiate the customer experience, airlines need to empower employees with knowledge of the passenger at each touch point.
Delivering a Superior Customer Experience Requires the Organization to Align Around the Customer

Critical enablers
- Enterprise CEM strategy
- Executive championship
- Customer understanding
- Relevant, timely offerings
- Voice of the customer (social media)
- Seamless and consistent experience across all touch points
- Collaboration capabilities
- Employee empowerment
- Experience monitoring and measurement capabilities
- Integrated technology capabilities
**Passenger Data Is The Key To Enhancing The Customer Experience**

<table>
<thead>
<tr>
<th>Pre-Arrival</th>
<th>Traveling Experience</th>
<th>Post-Departure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OBJECTIVES</strong></td>
<td>Effective Marketing</td>
<td>Member/Tier Identification</td>
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<td></td>
<td>Effective Sales</td>
<td>Customized Services</td>
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<td></td>
<td>Effective Promotions</td>
<td>Personalized Services</td>
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<td>Targeted Marketing</td>
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<tr>
<td><strong>PROCESSES</strong></td>
<td>Marketing/Branding</td>
<td>Arrival and Check-In</td>
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<td></td>
<td>Sales and Reservations</td>
<td>Lounge/On Board</td>
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<td></td>
<td>Revenue Management</td>
<td>Connection Service Delivery</td>
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<td></td>
<td>Product Development</td>
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<tr>
<td><strong>ENABLERS</strong></td>
<td>Sales/Marketing</td>
<td>Middleware</td>
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<td></td>
<td>Reservations</td>
<td>Customer Tier Recognition</td>
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<td></td>
<td>Revenue/Yield Management</td>
<td>Customer Master</td>
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<tr>
<td></td>
<td>GDS/CRS/DCS</td>
<td>GDS/CRS/DCS</td>
</tr>
<tr>
<td><strong>RESULTS</strong></td>
<td>MARKET SHARE</td>
<td>PROFITABILITY</td>
</tr>
</tbody>
</table>

**PASSENGER DATA LOYALTY MANAGEMENT**
Key Challenges Airlines Face With Managing Passenger Data

- **Multiple Data Sources For Passenger Data**
  - PNR data from global distribution systems, alliance partners and other airlines
  - Bookings from airline web portals and mobile devices
  - Bookings from travel agencies and OTA's
  - Bookings from reservation centers, ticket offices, and airport ticket counters
  - Customer profiles and transactions from loyalty management platforms

- **Multiple Internal Repositories For Passenger Data**
  - Passenger Service Systems
  - Departure Control Systems
  - Loyalty Management Systems
  - Customer Data Warehouses

- **Historical Data From Legacy Systems That Need to Be Modernized or Retired**
  - Booking data
  - Flight data
  - Loyalty transactions
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• Why Oracle Airline Data Model

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Passenger Data Drives The Customer Experience

Customer Engagement
- Social Networks
- Customer Service
- Reservations
- Ticket Counter
- Airline Portal
- Kiosk
- Agency Portal
- Smart Phone
- Tablet

Customer Lifecycle Management
- SOA/ESB/Middleware
- Marketing
- Sales
- Service
- Call Center
- Loyalty Management
- Loyalty Analytics

Customer Data Management
- Passenger Data Management
  - Oracle Airline Data Model
  - Historical Enterprise DW and Pre-built Analytics
  - Operational Data Store on Exadata

Customer Hub
- GDS
- PSS
- Loyalty

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Oracle Exadata Intelligent Warehouse for Airlines

Brings Together Deep Expertise and Leadership in the Airline Industry and in Data Warehousing
Oracle Exadata Intelligent Warehouse for Airlines

- Airlines Data Model
- Business Intelligence
- Exadata
Oracle Exadata Intelligent Warehouse for Airlines

- Better Business Insight
  - Airline specific data model
  - Based on industry standards
  - Packaged advanced analytics

- Extreme Performance
  - Improve query performance 10-100x with Exadata

- Fast Time-to-Value
  - Jumpstart development
  - Lower cost, risk, and complexity
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Oracle Airline Data Model

More Than Just a Data Model

Oracle Airline Data Model

• Industry-standard compliant based Enterprise-wide Data Model
  – Over 370+ tables and 8500+ columns
  – Over 250+ industry measures and KPIs
• Contains Logical and Physical Data Models
  – Third Normal Atomic, Dimensional Schema
• Industry specific Airlines Measures and KPI
• Pre-built OLAP cubes, Mining Models & Reports
• Automatic Data Movement Among Layers
• Extensive business intelligence metadata
• Easily extensible and customizable
• Usable within any GDS, GCS Applications
• Central repository for atomic level data
• Complete metadata (end-to-end)
• Rapid implementation
Oracle Airline Data Model Foundation Layer
## Oracle Airline Data Model

### Cross-Functional Data Models

<table>
<thead>
<tr>
<th>Reference</th>
<th>Base (3NF)</th>
<th>Aggregations</th>
<th>Derivations / Data Mining / OLAP</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Booking</th>
<th>Ticketing</th>
<th>Check-In</th>
<th>Flight</th>
<th>Carrier</th>
<th>Segment</th>
<th>Loyalty</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Booking &amp; Service Class:</strong></td>
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<tr>
<td>Booking Class</td>
<td>Service Class</td>
<td>Carrier Code</td>
<td>Effective Dates</td>
<td>Status</td>
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<tr>
<td><strong>Segment:</strong></td>
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<tr>
<td>Segment Type</td>
<td>Board Point and Off Point Airport Name</td>
<td>Board Point and Off Point City</td>
<td>Region</td>
<td>Country</td>
<td>Continent</td>
<td></td>
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</tr>
<tr>
<td><strong>Carrier:</strong></td>
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<tr>
<td>Carrier Code</td>
<td>Description</td>
<td>Carrier Type</td>
<td>Legal Name</td>
<td>Trading Name</td>
<td>Address</td>
<td>Status</td>
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<td><strong>Airport Codes:</strong></td>
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</tr>
<tr>
<td>Airport Code</td>
<td>City Code</td>
<td>Geo Hierarchy</td>
<td>City</td>
<td>Region</td>
<td>Country</td>
<td>Continent</td>
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<tr>
<td><strong>Traffic Category:</strong></td>
<td></td>
<td></td>
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<tr>
<td>Traffic Category</td>
<td>IATA Levels</td>
<td>Geo Area Name</td>
<td>Market Area Name</td>
<td>Calculation Year</td>
<td>Calculation Month</td>
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<td><strong>Frequent Flyer:</strong></td>
<td></td>
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</tr>
<tr>
<td>Frequent Flyer No.</td>
<td>Card Carrier</td>
<td>Airline Member Level</td>
<td>Alliance Member Level</td>
<td>Gender</td>
<td>Date of Birth</td>
<td>Address Location</td>
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<tr>
<td>Account Open Date</td>
<td>Account Expire Date</td>
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</tr>
</tbody>
</table>

| Flight: | | | | |
| Flight Number | Flight Type | Code Share Type | Carrier Code | Flight Status |

| Booking Office: | | | | |
| Booking Office Code | City Code | Country Code | IATA Code | Channel Type | Office Type | Agent Chain | Status |

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## Oracle Airline Data Model

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<tr>
<td>Booking:</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>• Booking Count by Time, Geography, Segment</td>
<td>• Booking Count by Channel, Agent, PNR Type, Class</td>
<td>• Average Fair</td>
<td>• Materialization Rates</td>
<td>• Booking Status Change</td>
<td>• Trends – Load, Fair, Season</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check-in:</td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>• Total Check in Count</td>
<td>• Total Group Baggage Count</td>
<td>• Total Check in Passenger by Passenger Type</td>
<td>• Total Baggage Count</td>
<td>• Total Boarded Count</td>
<td>• No-Show Rate</td>
<td>• Load Factor</td>
<td></td>
</tr>
</tbody>
</table>

### Revenue:

- Issued and Flown
- Rev. Maximization by Optimization (dimensions)
- Agent
- Channel
- Corporate and Individual
- Frequent Flyer
- OD
- Special service revenue

### Agent Fraud Analysis:

- Channel Identification
- Agent Fraud patterns
- Duplicate booking
- Speculative bookings
- Duplicate ticket numbers
- Revenue loss
- Cancellation Fee
- Unused inventory

### Frequent Flyer:

- Loyalty Program Performance
- Earn/Burn Ratio
- Partner Performance (Airline and Non-Airline)
- Tier Movements
- Promotions
- Member Churn Analysis
- Revenue and Liability Analysis
## Oracle Airline Data Model

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<tr>
<td>• Frequent Flyer Passenger Profiling</td>
<td>• Non-Frequent Flyer Passenger Profiling</td>
<td>• Customer Segment</td>
<td>• Customer Loyalty Classification</td>
<td>• Targeted Promotion</td>
<td>• Customer Life Time Value Analysis</td>
<td>• Frequent Flyer Passenger Prediction</td>
<td></td>
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<tr>
<td><strong>OLAP:</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Booking Count Time Series Analysis (YoY, MoM, Percent Change)</td>
<td>• Booking Office Ranking</td>
<td>• Sales Channel Sharing and Ranking</td>
<td>• Segment Ranking</td>
<td>• Passenger Feedback Reports</td>
<td>• Current FF Base</td>
<td>• Materialization Reports</td>
<td>• Seasonal Trend Report</td>
</tr>
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<td>• ASK Time Series Forecast</td>
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<td>• Route Passenger Count Time Series Forecast</td>
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<td>• Call Center Sales Performance Time Series Analysis</td>
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<td></td>
<td>• Customer Satisfaction Growth Trend</td>
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<td></td>
<td></td>
<td>• Sales/Flown Revenue Growth Trend</td>
</tr>
</tbody>
</table>
Key Business Processes In the Airline Industry

OADM Release 1.0 Covers the Passenger Business

Enhance Customer Loyalty, Asset Availability, Front and Back-Office Efficiency, and Regulatory Compliance with Airline Solutions from Oracle

Only Oracle offers a comprehensive airline architecture that provides interoperability, scalability, and high performance. Oracle’s hardware and software solutions are engineered to work together to provide exceptional performance and value to meet the current and future information technology needs of your airline. Oracle solutions help airlines deliver differentiated, personalized services to their customers across the customer lifecycle, maximize asset availability, and increase front and back-office efficiency.

1. **PASSANGER BUSINESS**
   Manage reservations and ticketing, check-in, baggage, boarding, airport lounges, in-flight, and post-flight processes for passengers. Collaborate closely with airlines and provide a seamless travel experience.

2. **CAPACOS BUSINESS**
   Provide domestic and international airline cargo and air passenger services. Manage cargo and flights, ensuring efficient and effective service, and manage revenue with_survival.

3. **STRATEGY AND PLANNING**
   Strategic forecasting, risk management, fleet, and network planning for passengers, cargo, and freight services. Optimize business models to maximize asset utilization through effective revenue, cost, and demand optimization.

4. **FLIGHT OPERATIONS**
   Efficient flight zone and ramp movement across the network. Manage flight planning, weight, and balance, crew, and gate assignments for flights. Manage aircraft, operations, and flight arrangements.

5. **AIRPORT OPERATIONS**
   Plan and ensure arrival, departure, and departure processes for passenger and cargo. Manage airport security, gate usage, and airport facility. Support aviation operations and airport services.

6. **SUPPORT SERVICES**
   Support program management, revenue accounting for passenger and cargo, waiting and certification for new and existing equipment, and support operations, maintenance, IT, services, and liability management.

7. **MAINTENANCE AND ENGINEERING**
   Manage contractual obligations to integrate and maintain all assets and other equipment, including ground service, vehicles, and buildings, and survival infrastructure. Ensure adherence to regulatory standards and compliance with regulatory standards.

**FINANCE**
- Manage transaction processing, and financial reporting with strong governance and risk management. Use enterprise performance management tools for financial planning, budgeting, and regulatory compliance.

**HUMAN CAPITAL MANAGEMENT**
- Recruit, develop, deploy, and manage workforce across the enterprise through automated tools for human capital management. Ensure training and development of personnel with access to superior management tools.

**LEGAL AND REGULATORY AFFAIRS**
- Manage compliance with industry regulations. Drive relationships with governments, aviation bodies, and regulatory agencies, ensuring alignment with laws and regulations. Support continuous improvement of key enterprises functions.

**GOVERNANCE, RISK, AND COMPLIANCE**
- Manage compliance with statutory, regulatory, and internal control requirements. Focus on risk management and governance to support the organization's goals and objectives.

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### Business Insights To Help You Make The Right Decisions

#### Business Areas Covered
- Reservations
- Revenue Management
- Pricing
- Airport Operations
- Flight Operations
- Alliances
- Loyalty Management
- Marketing

#### Sample Analytics
- What is the impact of the fare promotion on booking levels for this origin-destination pair?
- How do the overbooking levels and load factors compare for flights in this origin-destination pair?
- What is the price elasticity for economy fares by fare class in the ATL-NYC market?
- What is the number of kiosk check-ins by time of day and day of week at DFW?
- What is the on-time departure rate for flights out of the Chicago?
- How many seats did we sell through this alliance partner this quarter?
- What is the impact on activity levels of our Tier 1 members with our double miles loyalty promotion?
- What is the open rate for this email marketing campaign? What is the promotion acceptance rate?

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Get Insights Into Current Bookings

Using Pre-Built Analytics Analyze Current Passenger Bookings
Get Insights Into Future Passenger Demand

Using Pre-built Analytics Forecast Passenger Volumes
Get Insights Into Revenues By Flight

Using Pre-built Analytics On Flight Revenues and Pricing
Get Insights Into Your Best Prospects
Leverage Pre-Built Data Mining Models To Analyze Non-FFP Activity

Non FFP Activity Analysis
(Key Attributes Identified by Pre-built Data Mining Model)

- Number of Confirmed Bookings in the Last Month
- Life Time Group Booking for Non-FFP Passenger
- Life Time Confirmed Booking for Non-FFP Passenger
- Number of Bookings by Non FFP Passenger Last Month
- Life Time Business Class Booking
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Faster Time-to-Value

Simplified Deployment, Predictable Cost

Build from Scratch Approach

Oracle Airline Data Model

- Training & Roll-out
- Define Metrics & Dashboards
- Data Integration
- Analysis and Design
- Sizing and Configuration

Months or Years

Weeks or Months
Typical OADM Implementation

Out-of-the-Box Functionality Reduces Cost and Implementation Time

Oracle Airline Data Model

- LDM, PDM (3NF, STAR)
- Pre-built OLAP cubes
- Pre-built Mining models
- Intra-ETL among schema
- Intra ETL for OLAP & mining workflow
- Base, Reference, Lookup
- Aggregate & Derived
- Sample OBIEE metadata
- Sample OBIEE Dashboards & Reports
- Sample interface mapping
- Sample source system connectors
- Extensions to data model
- Extensions to STAR, OLAP, & mining models (or create new)
- Reports, Dashboards
- Intra-ETL extensions
- Workflow extensions

Source system ETL
Architecture
Staging (one or more)
Cleansing
MDM integration
Connectors development

Extension to data model
Relational interface
3NF, Lookup
interface mapping
extension
Workflow extension
Extending sample Connectors

Customer, SI, Partner Develop/Extend

Out-of-the-Box

Customer, SI, Partner Develop/Extend

BI & Dashboards
Defining roles
Development of role-based Dashboards
Customization/creation of
- sample reports
- OLAP models
- Mining models
Defining KPIs, thresholds, and alerts
Guided analytics
Closing the loop with source
Why OADM - Key Differentiators

Exadata Intelligent Warehouse For Airlines

• Enables Intelligent Insight and Powerful Analysis Through Oracle DW & BI Technology
  – All the key subject areas covered like Reservation, Flight Scheduling, Departure Control, Frequent Flier, Revenue Accounting etc
  – Pre-built Airlines specific dashboards & insightful sample reports (developed using OBIEE)
  – Enhanced summary level data for OLAP & mining analysis
  – Automatic data movement (pre-built) & process flows to support KPIs
  – Physical model pre-tuned for VLDB deployment on Oracle

• ‘DW out-of-the-box’ that Facilitates Rapid Implementation
  – “Buy and Extend” rather than “Build from Scratch” DW+BI Solution
  – Easily extensible & customizable (modular design and flexible hierarchy [applying for patent])
  – DW implementation could start wherever the needs or opportunities in the organization are greatest
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Summary

- To retain and grow their customer base, airlines need to focus on the **customer experience**.

- To personalize and differentiate the customer experience, airlines need to effectively manage their **passenger data**.

- **The Oracle Airline Data Model** can help airlines jump start their customer experience initiatives by consolidating passenger data into a customer data hub that drives real-time business intelligence and strategic customer insight.

- Oracle’s Airline Data Model brings together base data, reference data, and derived data into a comprehensive logical and physical data model that can jump start your data warehousing project with rich out-of-the-box functionality.

- **Oracle’s Intelligent Warehouse for Airlines** brings together the powerful capabilities of Oracle Exadata and the Oracle Airline Data Model to give you the high performance operational data store and data warehouse you need to get real-time and strategic insights into passenger demand, revenues, sales channels and your flight network..
Hardware and Software

Engineered to Work Together