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Oracle Airline Data Model

Business Overview Presentation

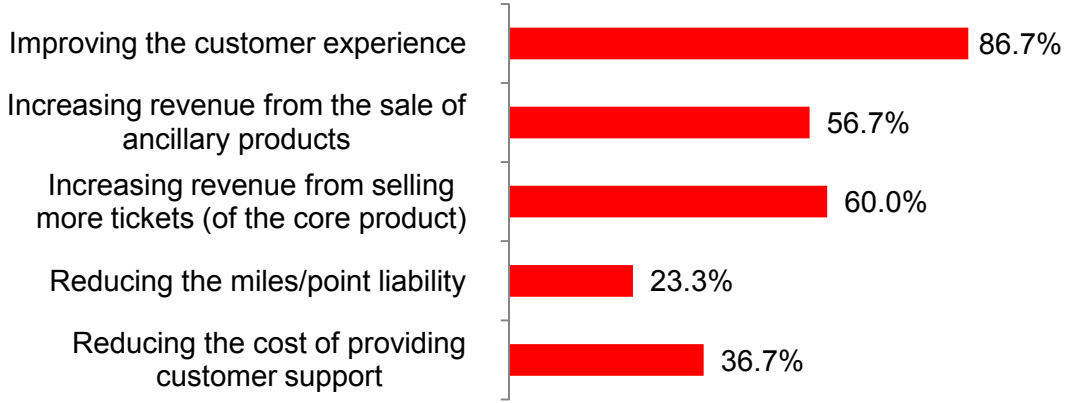
The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

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

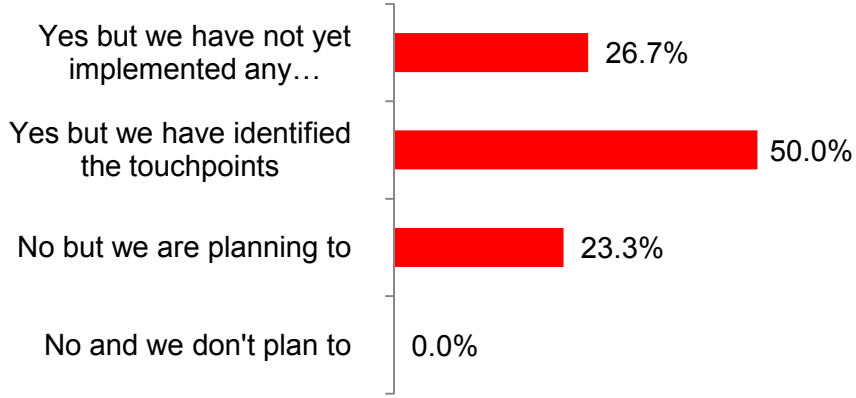
Enhancing the Customer Experience is the Top Priority For Airlines

Top Airline Priorities for 2011



Source: Airline Information Survey 2011

Progress Made on Top Priorities



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.

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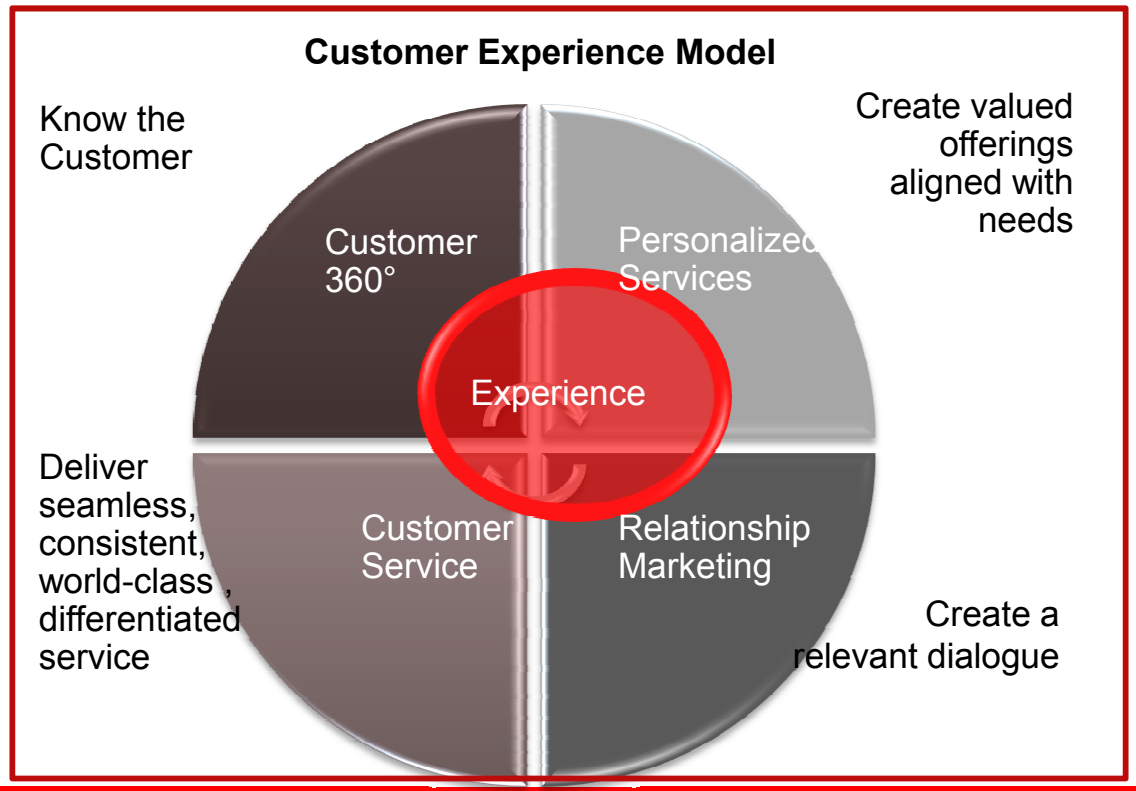
Delivering a Superior Customer Experience Requires the Organization to Align Around the Customer



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

	Pre-Arrival	Traveling Experience	Post-Departure
OBJECTIVES	Effective Marketing Effective Sales Effective Promotions Targeted Marketing	Member/Tier Identification Customized Services Personalized Services	Re-Book Reward Recover
PROCESSES	Marketing/Branding Sales and Reservations Revenue Management Product Development	Arrival and Check-In Lounge/On Board Connection Service Delivery	Measure Follow-up Loyalty Traveler Response
ENABLERS	Sales/Marketing Reservations Revenue/Yield Management GDS/CRS/DCS	Middleware Customer Tier Recognition Customer Master GDS/CRS/DCS	Loyalty Analytics Service Billing
RESULTS	MARKET SHARE	PROFITABILITY	SATISFACTION

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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Passenger Data Drives The Customer Experience

Shop | Buy | Pre-Flight | In-Flight | Post-Flight | Delight

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

SOA/ESB/Middleware

Customer Engagement

Shopping Experience | Booking Experience | Pre-flight Experience | In-Flight Experience | Service Experience | Search Experience | Social Experience | Mobile Experience

SOA/ESB/Middleware

Customer Lifecycle Management

Marketing | Sales | Service | Call Center | Loyalty Management | Loyalty Analytics

SOA/ESB/Middleware

Customer Hub

Customer Data Management

Passenger Data Management

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

GDS | PSS | Loyalty

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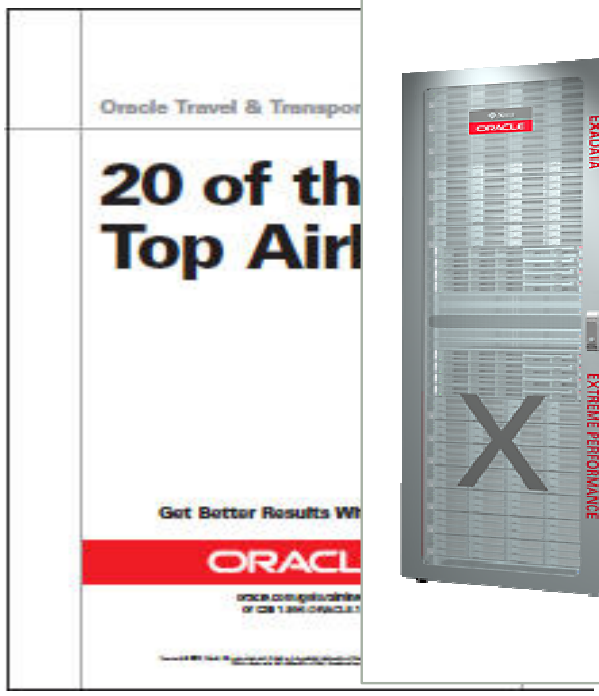
Oracle Exadata Intelligent Warehouse for Airlines

Brings Together Deep Expertise and Leadership in the Airline Industry and In Data Warehousing



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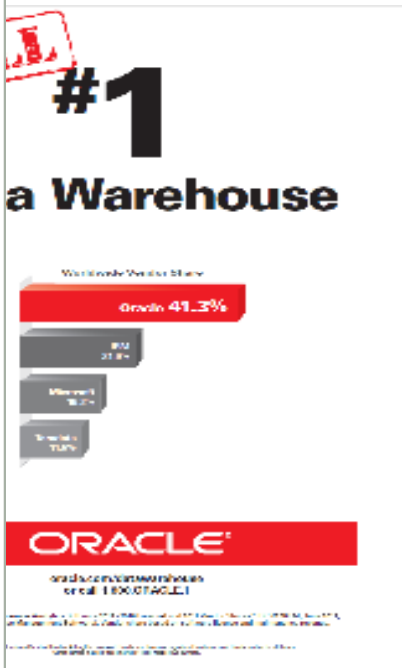
Exadata Intelligent Warehouse for Airlines



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Oracle Exadata Intelligent Warehouse for Airlines

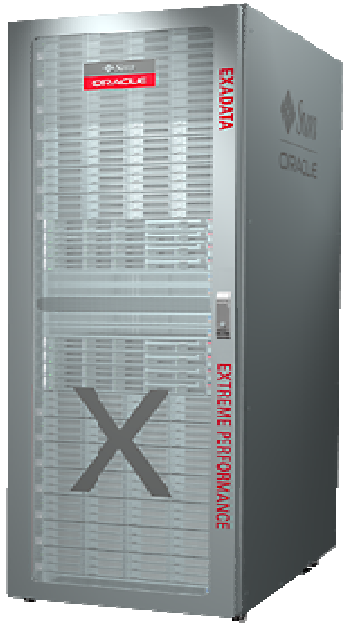
ORACLE Airlines Data Model

ORACLE Business Intelligence

ORACLE 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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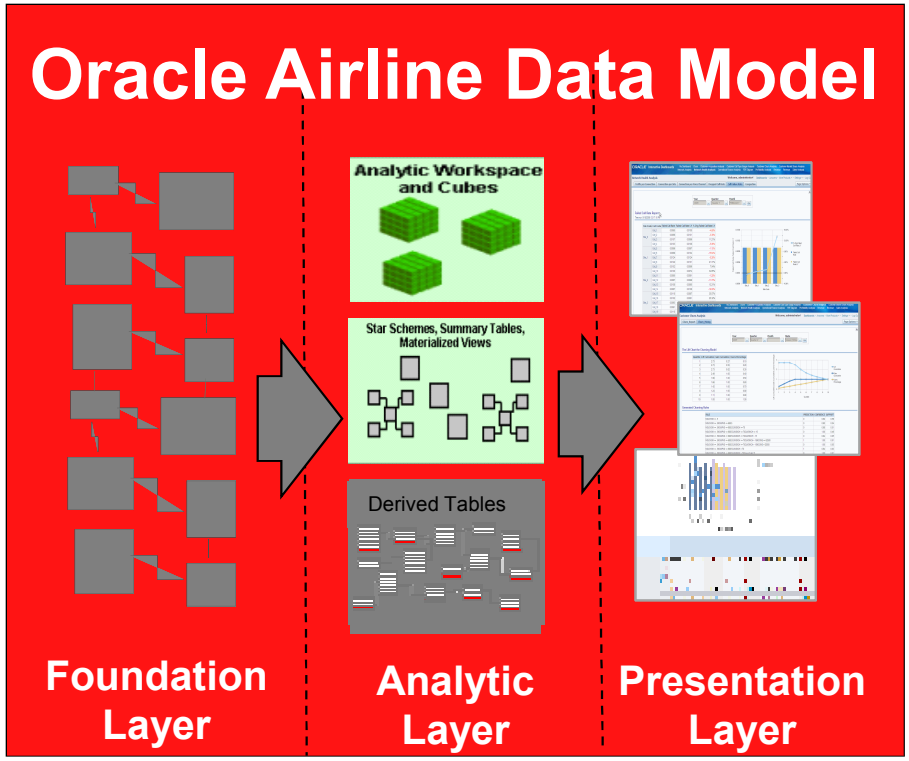
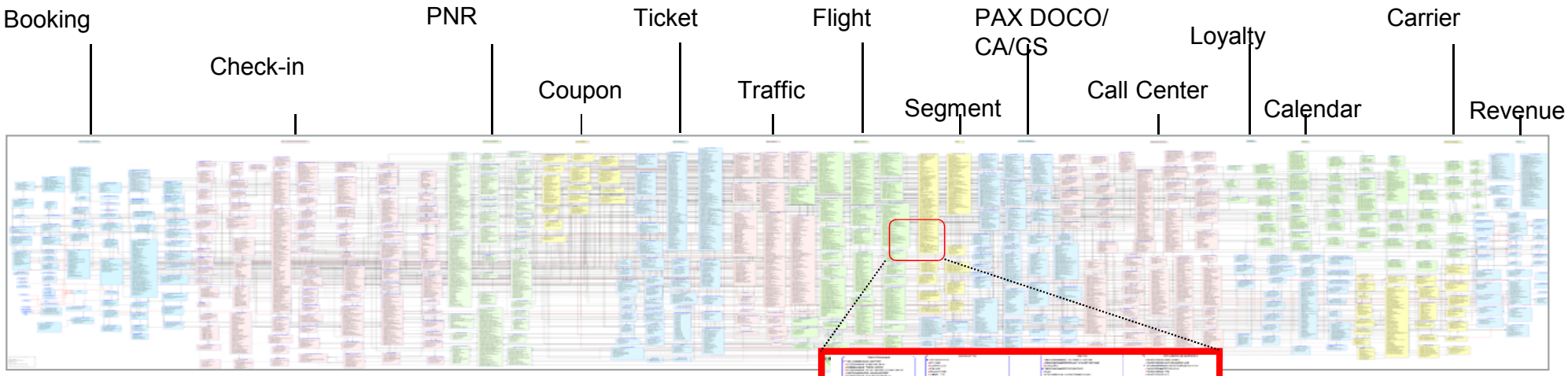
Oracle Airline Data Model

More Than Just a Data Model



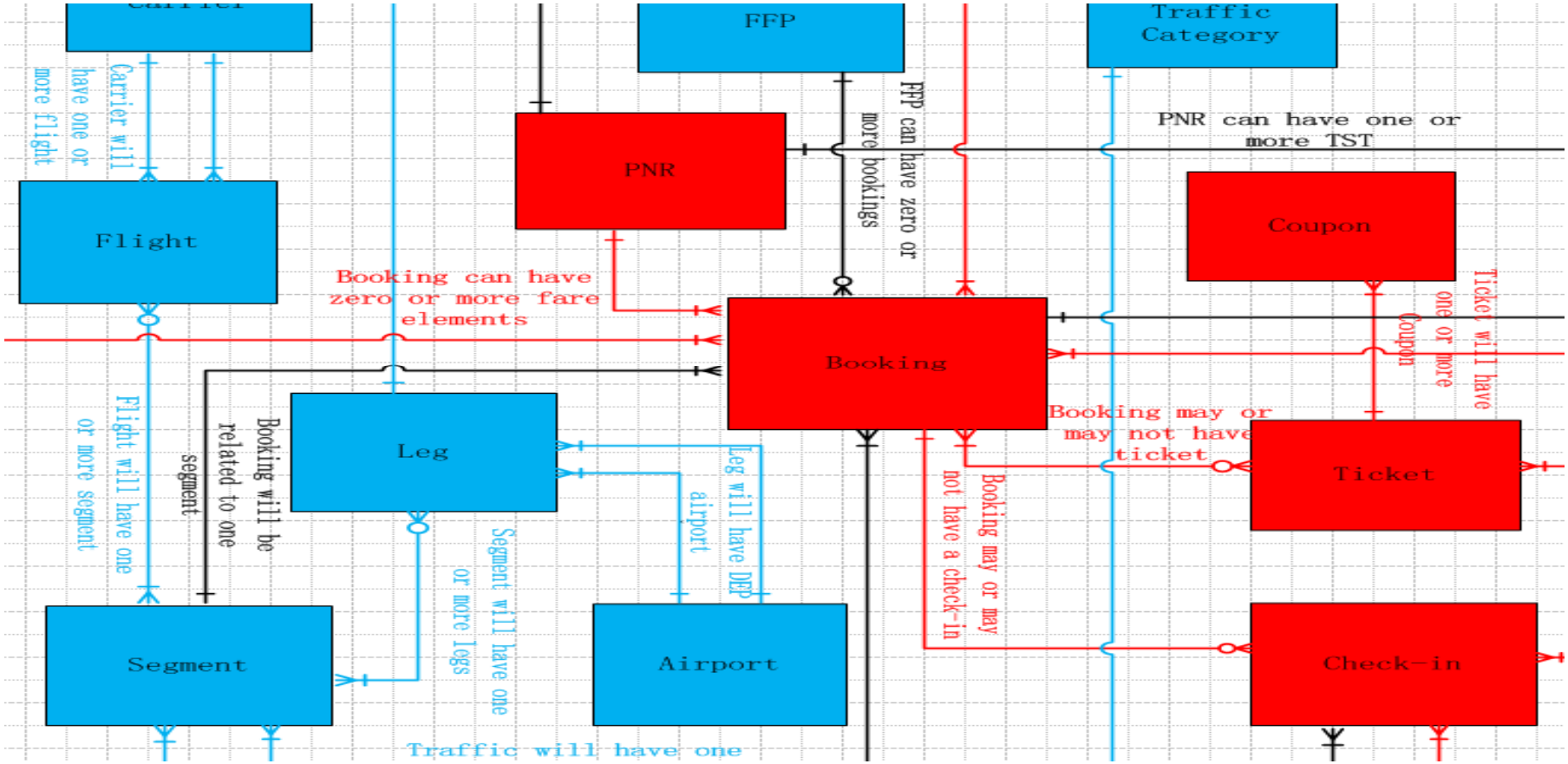
- Industry-standard compliant based Enterprise-wide Data Model
  - Over 370+ tables and 8500+ columns
  - Over 250+ industry measures and KPIs
- Contains Logical and Physical Data Models Third Normal Atomic, Dimensional Schema
- Industry specific Airlines Measures and KPI
- Pre-built OLAP cubes, Mining 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

Conceptual Model



Oracle Airline Data Model

Cross-Functional Data Models

	Booking	Ticketing	Check-In	Flight	Carrier	Segment	Loyalty	Revenue
Reference								
Base (3NF)								
Aggregations								
Derivations / Data Mining / OLAP								

Booking & Service Class:
- Booking Class
- Service Class
- Carrier Code
- Effective Dates
- Status

Segment:
- Segment Type
- Board Point and Off Point Airport Name
- Board Point and Off Point City
- Region
- Country
- Continent

Airport Codes:
- Airport Code
- City Code
- Geo Hierarchy
- City
- Region
- Country
- Continent

Carrier:
- Carrier Code
- Description
- Carrier Type
- Legal Name
- Trading Name
- Address
- Status

Traffic Category:
- Traffic Category
- IATA Levels
- Geo Area Name
- Market Area Name
- Calculation Year
- Calculation Month

Frequent Flyer:
- Frequent Flyer No.
- Card Carrier
- Airline Member Level
- Alliance Member Level
- Gender
- Date of Birth
- Address Location
- Account Open Date
- Account Expire Date

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

Oracle Airline Data Model

Cross-Functional Data Models

Booking	Ticketing	Check-In	Flight	Carrier	Segment	Loyalty	Revenue

Reference

Base (3NF)

Aggregations

Derivations / Data Mining / OLAP

Booking:
- Operating and Marketing Flight
- Agent
- Class
- Origin-Destination
- Frequent Flier
- Group
- Seat Details and Preferences
- Special Requests

Ticket:
- Primary Number
- Agent
- Currency
- Total Amount
- Issue Date
- Creation Date
- Tax, Payment and Service Fee

Check-in:
- Carrier
- Check-In Channel
- Agent
- Airport
- Segment
- Boarding Status
- Baggage Status

Coupon:
- Coupon Number
- Origin-Destination
- Agent
- Ticket Number
- Coupon Amount
- Currency Details
- Flight Details

PNR:
- Type
- Purge Date
- Group Name
- Journey Origin/Destination/Return Point
- Agent
- Frequent Flier Number

PAX/DOCO/CA/CS:
- Passenger Nationality
- Address
- Travel Doc Type
- Issue Country
- Expiry Date
- Doc Number
- Gender
- DOB
- Passport Hold Indicator

Booking TST:
- Transitional Store Ticket No.
- Origin
- Destination
- Ticket Type
- Fare Calculation Model

Flight Schedule:
- Flight Date.
- Flight No.
- Flight Carrier Code
- Segment ID
- LEG ID
- LEG Aircraft Configuration Code
- Total Saleable Capacity
- Nautical Miles

Oracle Airline Data Model

Cross-Functional Data Models

Booking	Ticketing	Check-In	Flight	Carrier	Segment	Loyalty	Revenue

- Reference
- Base (3NF)
- **Aggregations**
- Derivations / Data Mining / OLAP

Booking:
- Booking Count by Time , Geography, Segment
- Booking Count by Channel, Agent, PNR Type, Class
- Average Fair
- Materialization Rates
- Booking Status Change
- Trends – Load, Fair, Season

Check-in:
- Total Check in Count
- Total Group Baggage Count
- Total Check in Passenger by Passenger Type
- Total Baggage Count
- Total Boarded Count
- No-Show Rate
- Load Factor

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

Customer Interaction:
- Onboard Service Satisfaction Rate
- Ground Service Satisfaction Rate
- Customer Complain
- Call Center Average waiting time

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

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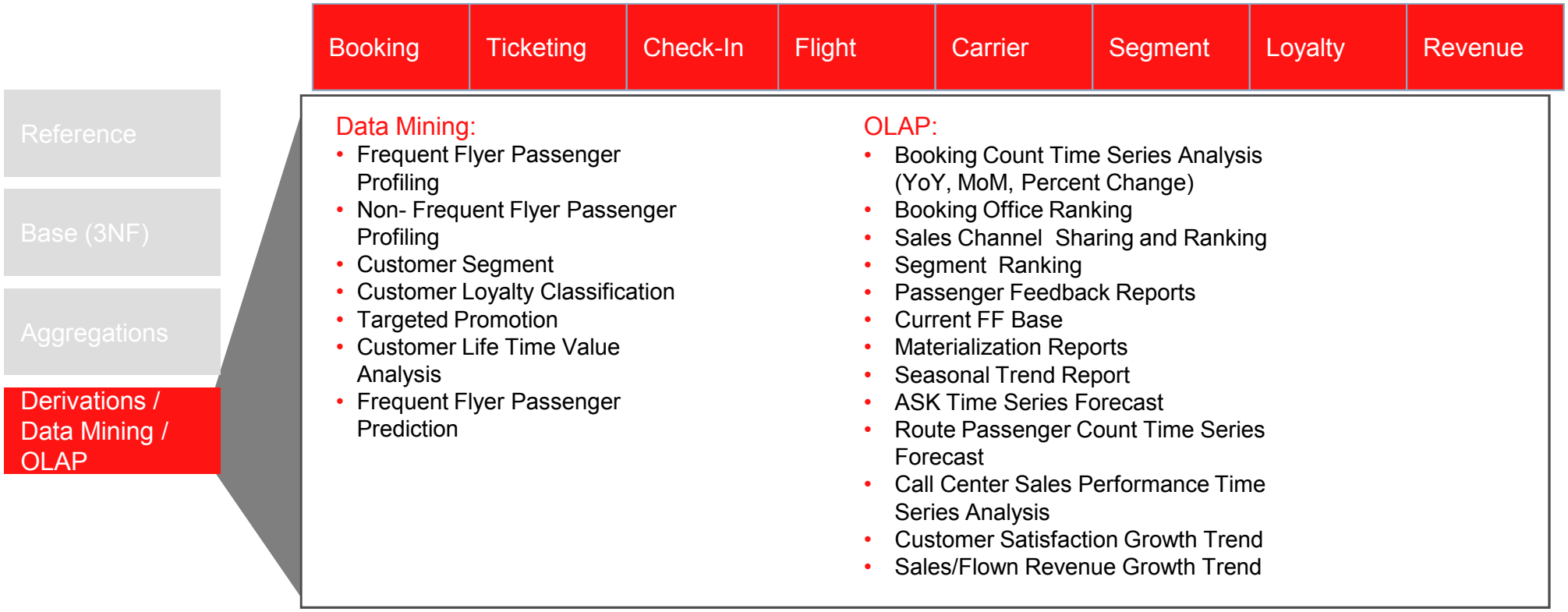
Oracle Airline Data Model

Cross-Functional Data Models



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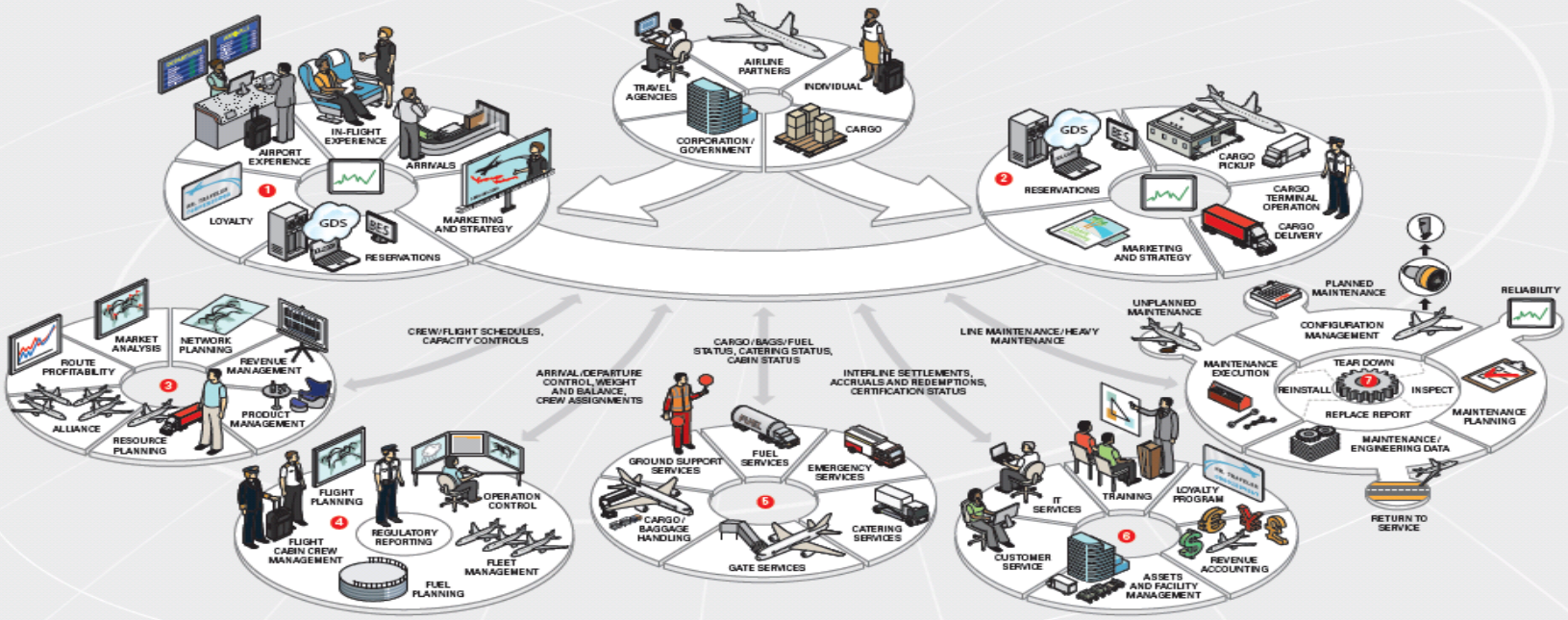
Key Business Processes In the Airline Industry

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's solutions help airlines deliver differentiated, personalized services to their customers across the customer lifecycle; maximize asset availability; and increase front and back-office efficiency.



FINANCE
Manage transaction processing and financial reporting with strong governance and risk management. Use enterprise performance management tools for financial planning, budgeting, profitability, and cost management.

HUMAN CAPITAL MANAGEMENT
Recruit, develop, deploy, and manage talent across the enterprise using automated tools for human capital management. Manage training and deployment of personnel with unique aviation-specific qualifications.

LEGAL AND REGULATORY AFFAIRS
Manage compliance with industry regulations. Drive relationships with governments, aviation agencies, and industry associations. Manage legal matters involving individual customers, corporations, and governments.

GOVERNANCE, RISK, AND COMPLIANCE
Manage compliance with aviation, security, labor, financial, and other regulations. Assess, mitigate, and manage enterprise risk. Implement strong governance for key enterprise functions.

1 PASSENGER BUSINESS
Manage reservations and ticketing, check-in, baggage, boarding, airport lounges, in-flight, and postflight processes for passengers. Collaborate closely with alliance and code-share partners, enabling a seamless travel experience.

2 CARGO BUSINESS
Provide domestic and international time-definite and deferred cargo and mail transportation services. Manage air cargo hubs and stations, coordinate with forwarders and alliance carriers, and manage interface with customs.

3 STRATEGY AND PLANNING
Demand forecasting, yield management, fleet, and workforce planning for passenger, cargo, and mail services. Optimization-based modeling to examine aircraft purchase and retirement options, route and slot acquisitions, and alliances.

4 FLIGHT OPERATIONS
Monitor flight, crew, and resource movement across the network. Manage flight planning, weight and balance, crew, and gate assignment for flights. Manage off-schedule operations and flight emergencies.

5 AIRPORT OPERATIONS
Plan and execute arrival, transfer, and departure processes for passengers at airports. Manage ticket counter, gate, ramp, baggage, and control-tower operations. Support security operations and retail services.

6 SUPPORT SERVICES
Loyalty program management, revenue accounting for passengers and cargo, training and certification for crew and airport operations personnel, customer support, enterprise IT services, and, facility management.

7 MAINTENANCE AND ENGINEERING
Acquire, support, repair, and overhaul planes and other equipment including ground service vehicles and building and terminal infrastructure. Record maintenance activities in compliance with regulatory standards.

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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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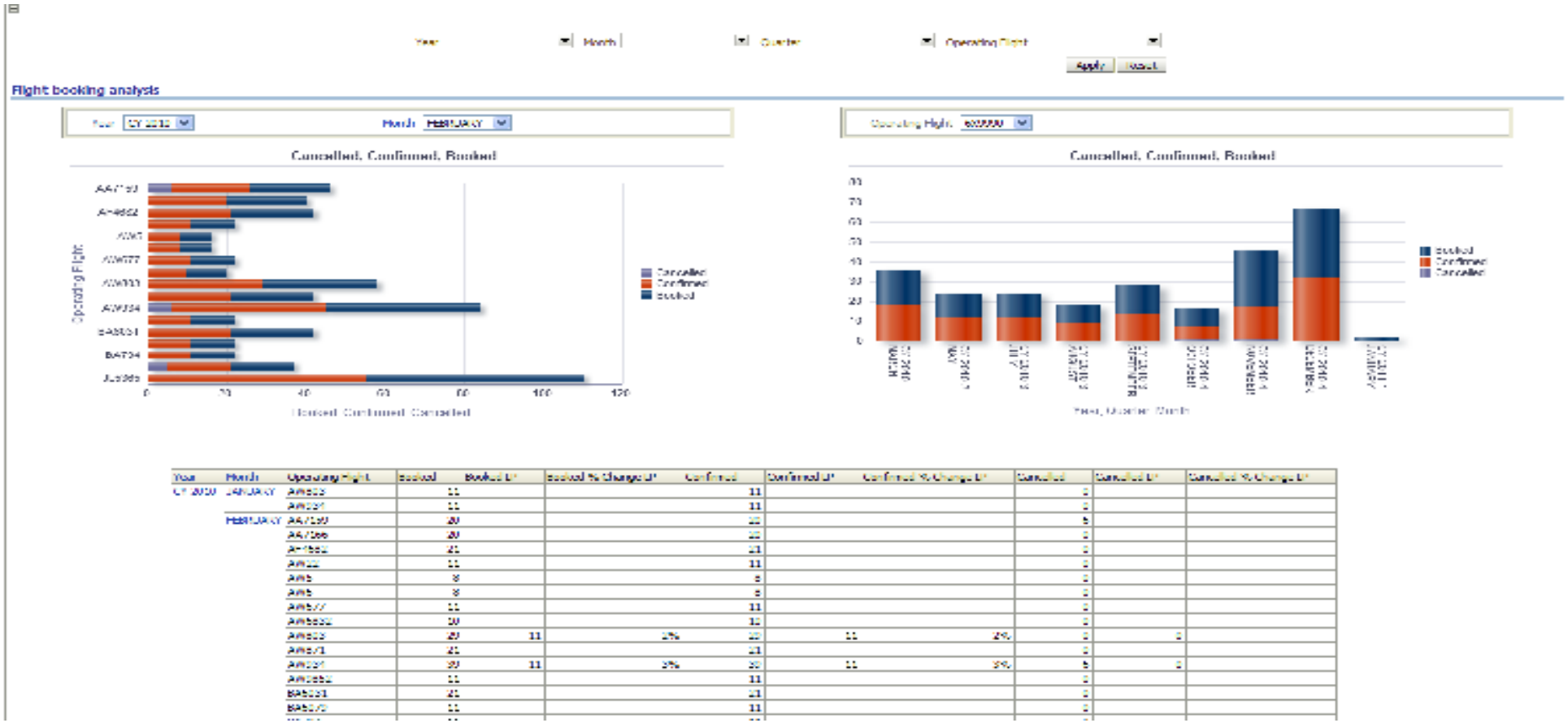
Get Insights Into Current Bookings

Using Pre-Built Analytics Analyze Current Passenger Bookings



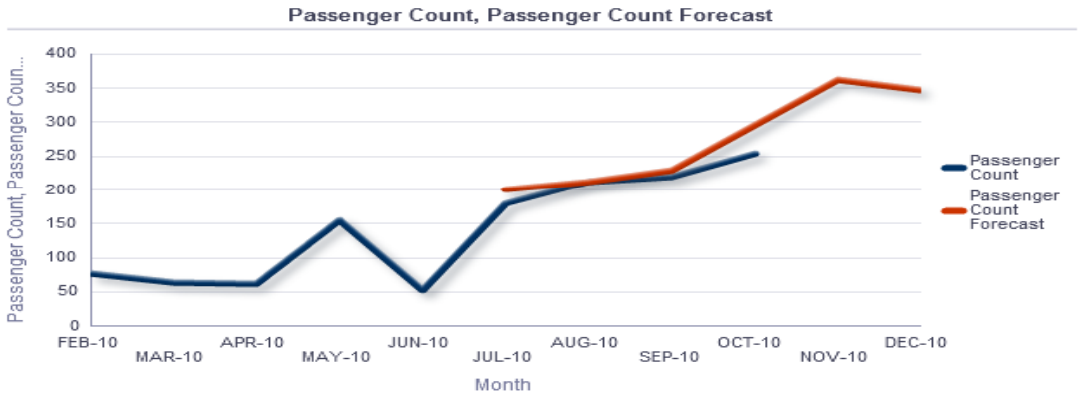
Get Insights Into Future Passenger Demand

Using Pre-built Analytics Forecast Passenger Volumes

Year | Month | Operating Segment | Apply | Reset

Route Passenger Count Forecast

Operating Segment: AAE - CDG

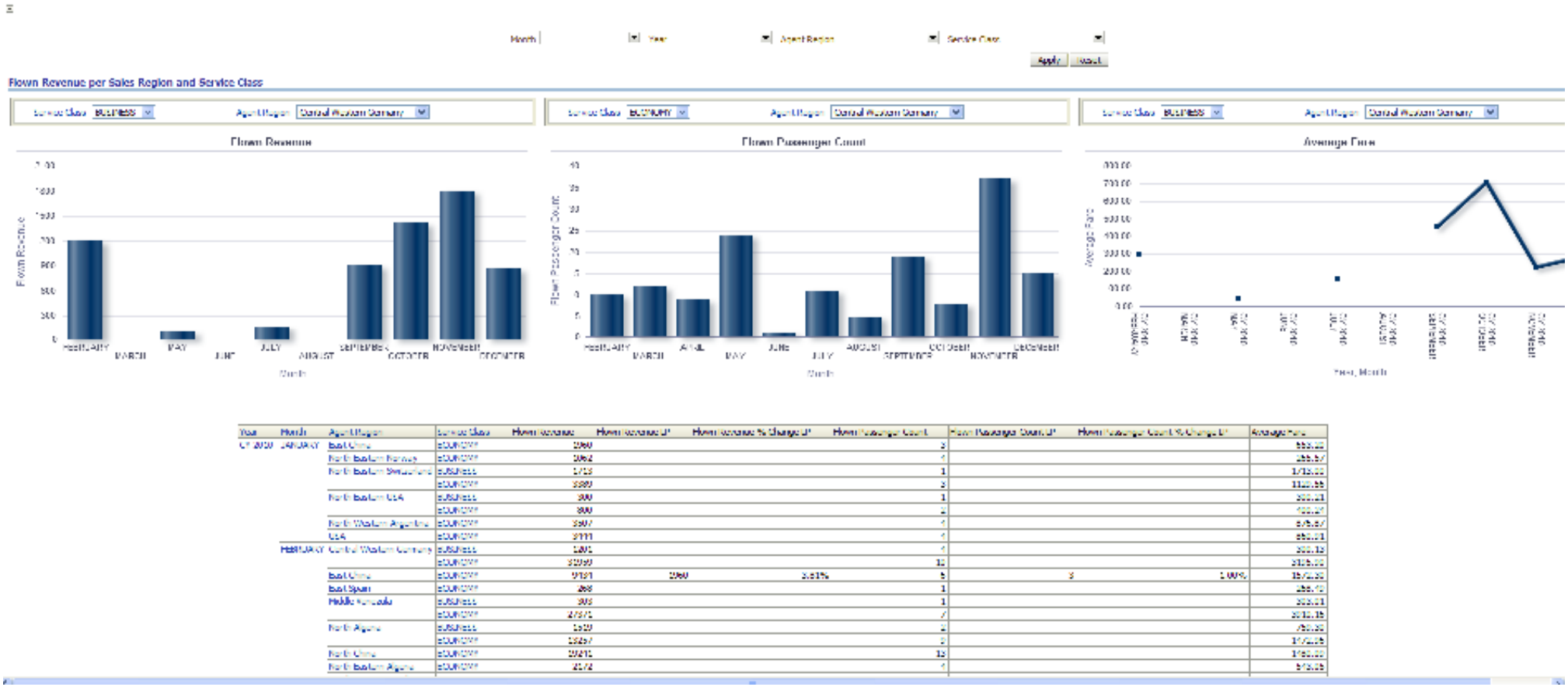


Year	Month	Operating Segment	Passenger Count	Passenger Count Forecast
CY 2010	FEB-10	AAE - CDG	76	
		AAE - HKG	38	
		AAE - LHR	56	
		AAE - STO	28	
	MAR-10	AAE - CDG	64	
		AAE - HKG	126	
		AAE - LHR	228	
		AAE - STO	68	
	APR-10	AAE - CDG	62	
		AAE - HKG	16	
		AAE - LHR	32	
		AAE - STO	16	
	MAY-10	AAE - CDG	154	
		AAE - HKG	176	
		AAE - LHR	214	
		AAE - STO	98	
	JUN-10	AAE - CDG	52	
		AAE - HKG	16	
		AAE - LHR	16	
		AAE - STO	16	
	JUL-10	AAE - CDG	180	201
		AAE - HKG	88	123
		AAE - LHR	102	151
		AAE - STO	102	151
	AUG-10	AAE - CDG	212	212

Rows 1 - 25

Get Insights Into Revenues By Flight

Using Pre-built Analytics On Flight Revenues and Pricing



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Get Insights Into Your Best Prospects

Leverage Pre-Built Data Mining Models To Analyze Non-FFP Activity

DT Rule ID	Target Measure Name	Target Measure Value	Non-FFP Customer Profile	Customer Count	Prediction Count
1	1		MO_GRP_BKGS <= .5	2,034	1,067
2	1		MO_GRP_BKGS <= .5 AND TOT_CPN_AMT <= 1485.035	1,576	908
3	0		MO_GRP_BKGS <= .5 AND TOT_CPN_AMT > 1485.035	458	299
4	1		MO_GRP_BKGS > .5	252	229

Customer Travel Doc Number	Customer SVM Prediction	Customer SVM Prediction Probability	Customer DT Prediction
00150444	0	0.82	1
012345678	0	1.00	1
017373329	1	0.82	0
02YK37247	1	0.82	0
038543178	0	0.82	0
038621441	1	0.82	1
040533435	1	0.82	1
050326571	1	0.82	1
050411618	1	0.82	1
060135436	1	0.82	0

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

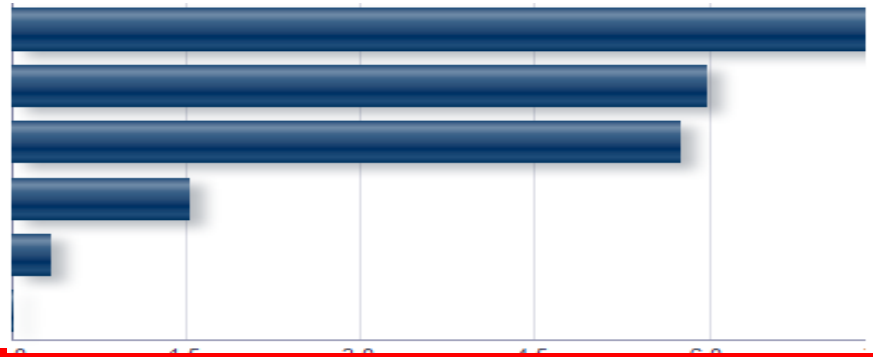
Number of Confirmed Bookings in the Last Month

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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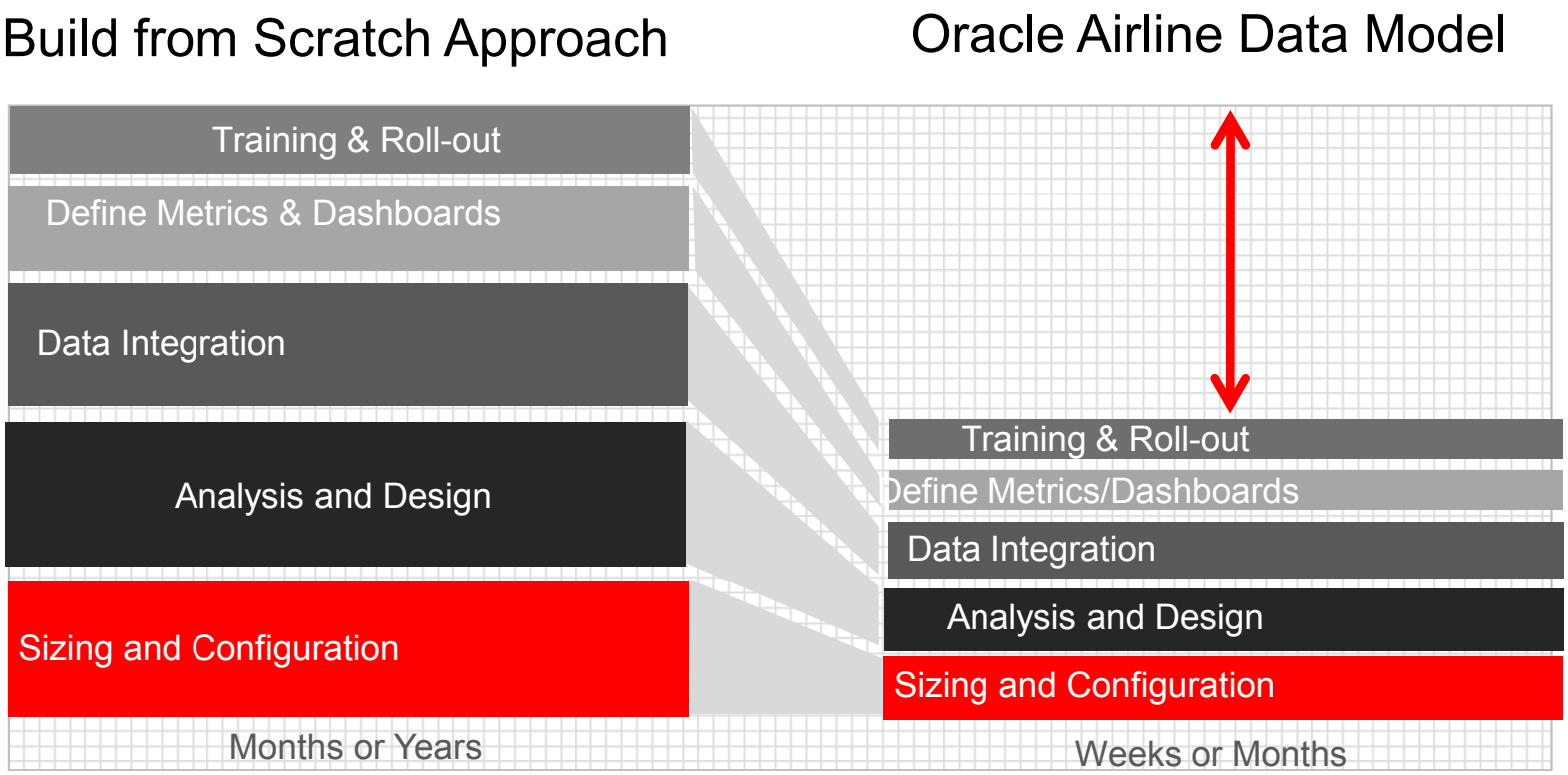
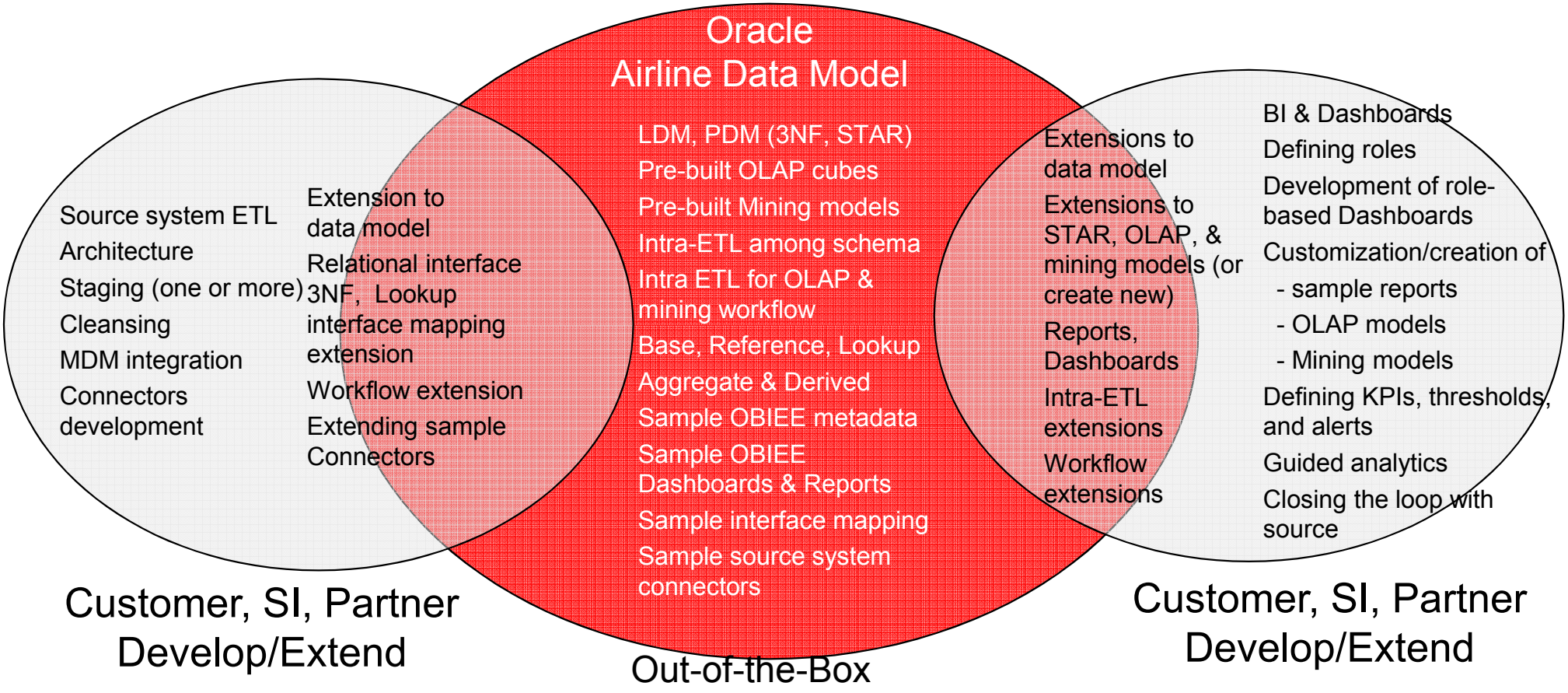
Faster Time-to-Value

Simplified Deployment, Predictable Cost



Typical OADM Implementation

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



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

ORACLE

Engineered to Work Together


ORACLE®