DATA MANAGEMENT - FALL 2022

Low Fares, Big Data

The Data Management of Southwest Airlines

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Overview

1

Data Strategy

We'll begin by discussing the data strategy that our team believes to be the best choice for Southwest Airlines

2

Data Systems

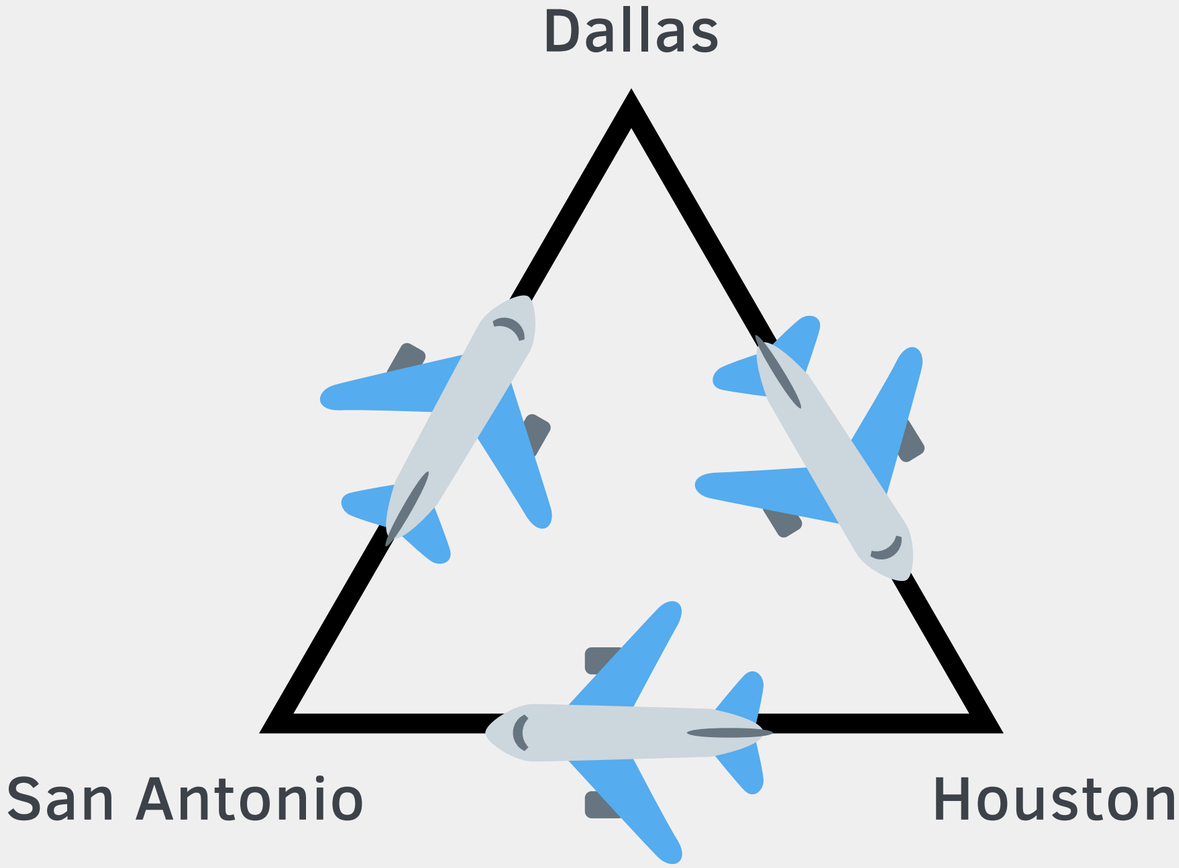
Next, we'll take a look at how Southwest utilizes OLTP systems, data warehousing, & unstructured data in their operations

3

Data Governance

We'll conclude by discussing the data governance policies that we believe Southwest should embrace in order to succeed

Data Management Strategy



About Southwest

Mission

"To connect People to what's important in their lives through friendly, reliable, and low-cost air travel"

Vision

"To become the the world's most loved, most efficient, and most profitable airline"

Business Model

"Extremely efficient operations, low-cost pricing, and innovative logistics solutions"

An Offensive Strategy

Deriving insights from the data → Better decision making → Developing a competitive advantage

Benefits

Smarter Mainentance

Aircraft sensor data analyzed per trip to identify ways to achieve fuel efficiencies

Safer Flights

Flight incident data analyzed to target weak links in flights

Improved Service

Consumer spending habits data run on machine learning models to personalize offers and promotions

Customer Satisfaction

Predictive models on consumer data to personalize experience or baggage data transformed into consumer bag tracking application

OLTP Systems

Ticketing

TEXT HERE

Baggage Tracking

TEXT HERE

Plane Maintenance

TEXT HERE

Here is how I imagine transactions would be logged

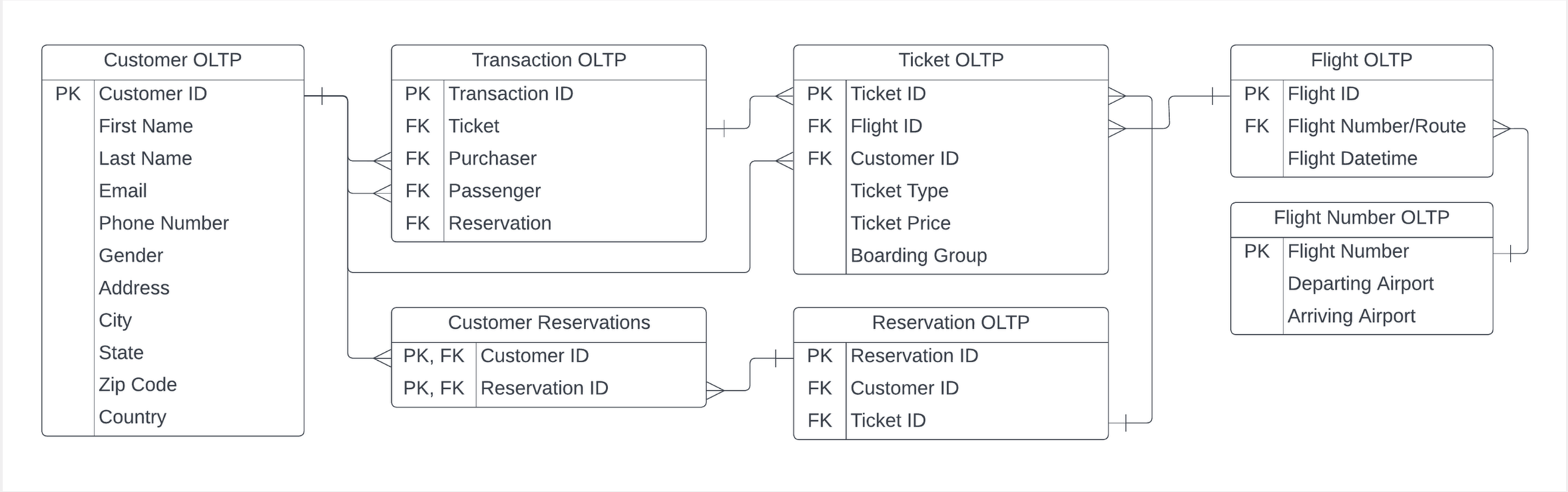
Each ticket for each passenger gets logged on its own row, even though they were all purchased at the same time by Bob. This enables us to track every transaction at the ticket level rather than the reservation level

Scenario: Bob creates a reservation and buys round trip tickets for himself, his wife, and his daughter

Transaction Table

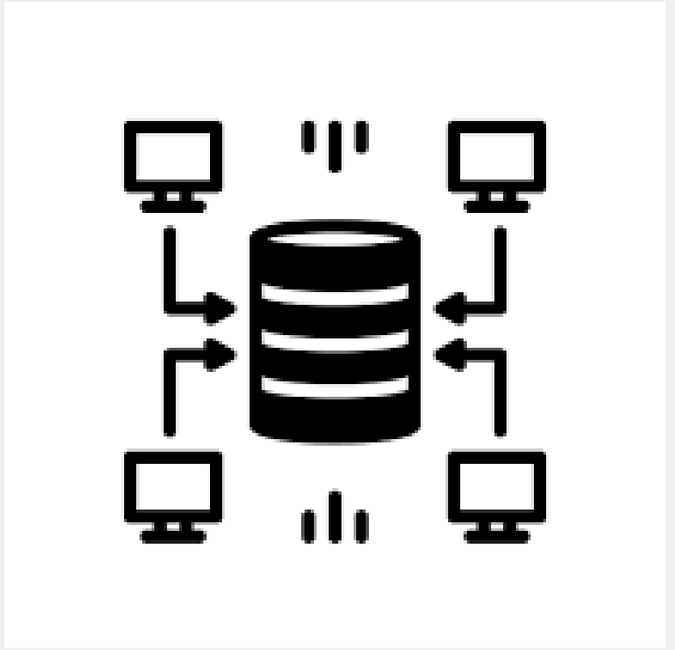
Purchaser	Passenger	Reservation	Ticket	Transaction Datetime
Bob	Bob	Disney Trip	Ticket 0	11/25/22 16:47
Bob	Wife	Disney Trip	Ticket 1	11/25/22 16:47
Bob	Daughter	Disney Trip	Ticket 2	11/25/22 16:47
Bob	Bob	Disney Trip	Ticket 3	11/25/22 16:47
Bob	Wife	Disney Trip	Ticket 4	11/25/22 16:47
Bob	Daughter	Disney Trip	Ticket 5	11/25/22 16:47

Rough Draft of Ticketing OLTP System

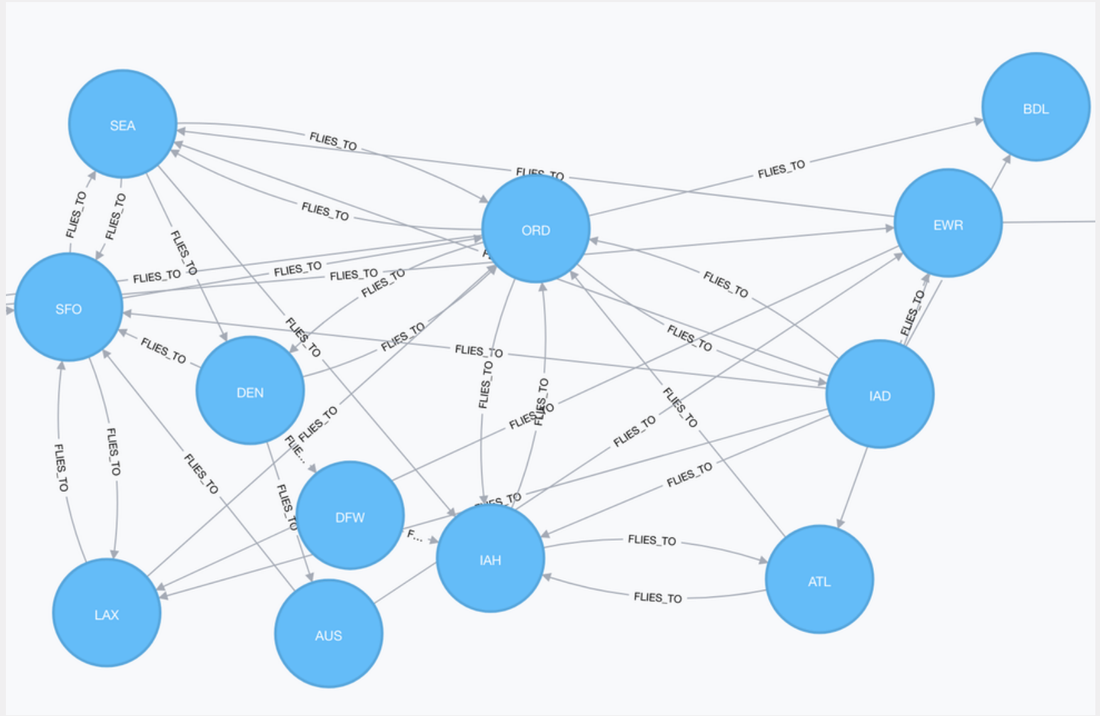


ERDs

Data Warehouse



Unstructured and Semi-Structured Data



Flight Graph

The graph can be applied to many things:

- Pricing engine
- Construct models for route&ticketing variables
- Recommendation system

Photos & Audio

- Photos of damaged luggage
- Pictures of plane part for defect detection
- Pilot audio recording

Role/Access Matrix

Data Governance Mechanisms

Framework

Classification

Discovering and identifying different types of data

Categorizing the data according to business terms and data classes

Policy

Set of guidelines to manage data effectively

CCPA, HIPAA or others.

Rules

Help us ensure we follow the policy

Data Owners and Data Stewards

Data Source

Data Mapping- How data from one source relates to other sources

Metadata- Help describe 'what/where/how' of data

Reflection

What we learned

What was most valuable

Using what we learned going forward

Additional opportunities

Capturing those opportunities