

Operational Data Architecture

Part 1:

The Operational Data Landscape

Angelo Bobak



DA-03 Operational Data Architecture Part 1: The Operational Data Landscape

Module 0: About the Course (2 min)

Module 1: Traditional Operational Systems (50 min)

- Transactional Systems
 - ERP – Enterprise Resource Planning
 - CRM – Customer Relationship Management
 - OMS – Order Management Systems
 - Legacy Transactional Systems
 - Human Resources Systems
 - Educational Systems
 - Transactional Systems
- Automation Systems
 - Automotive Assembly Lines
 - Commercial Food Packing Lines
 - Chemical Process Control
 - Feedback Control Systems
 - Supermarket Self-Checkout
 - Supermarket Self-Checkout at a National Level
 - Workflow Management
 - Manufacturing Assembly Lines – Manual or Robotic
 - Order Processing & Fulfilment
 - Return Processing & Customer Complaints
 - Inventory Control
 - Food Packing
 - Mail Delivery & Sorting
 - Other...
 - Topic Summary
- Module Summary

Module 2: IoT and Data Platforms (54 min)

- Commercial and Industrial IoT
 - logistics
 - Shipping Container Tracking
 - Freight Railroad Car Tracking
 - Freight Truck (Tractor/Trailer) Tracking
 - Commercial & Home security Monitoring
 - Municipal Utility Usage Tracking
 - Commercial and Industrial IoT - Summary
- Operational Data Platforms
 - Cloud Computing
 - ERP – Enterprise Resource Planning, On-Premises
 - ERP – Enterprise Resource Planning, Off-Premises
 - CRM – Customer Relationship Management



DA-03 Operational Data Architecture

Part 1: The Operational Data Landscape

- Asset Management
- Cloud Computing
- SaaS – Software as a Service
- IaaS – Infrastructure as a Service
- IaaS – Virtually Extend your own Infrastructure
- PaaS – Platform as a Service
- DaaS – Desktop as a Service
- MSaaS – Managed Software as a Service
- MBaaS – Mobile Back-End as a Service
- DCaaS – Data Center as a Service
- IPaaS – Integration Platform as a Service
- ITaaS – Information Technology as a Service
- Cloud Computing - Summary
- Module Summary

Module 3: Global Data Architecture Conventions (55 min)

- Data Structures
 - Data Structure's We Will Cover
 - Relational Data Model
 - Hierarchical Model
 - Network Data Model
 - Object Data Model
 - C Programming as an Object-Oriented Language
 - Unstructured Data
 - Summary
- Big Data
 - What is BIG Data?
 - Hadoop
 - Mongo DB
 - Mongo DB Architecture
 - Cassandra
 - Topic Summary
- JSON Documents
 - JSON – Java Script Object Notation
 - XML
 - Topic Summary
- Sensor & Telemetry Data
 - Area Temperature Monitoring
 - Feedback Control Systems
 - Temperature Log
 - Air Temperature Monitoring
 - Summary
- Naming & Data Standards
 - Naming Standards
 - Key Actors



DA-03 Operational Data Architecture Part 1: The Operational Data Landscape

- Topic Summary
- Format Standards
 - Format Standards Example
 - Summary
- Module Summary

Module 4: Global Data Architecture Challenges (62 min)

- Global Enterprise Conflict
 - Global Data Conflicts
 - Normal Form
 - Global Data Conflicts (Continued)
 - Summary
- Distributed Data
 - What is Distributed Data?
 - Distributed Architectures, Heterogeneous Data
 - Global Data
 - Summary
- Duplicate Data
 - What is Duplicate Data?
 - How to Fix Duplicate Data?
 - Summary
- Conflicting Standards
 - Data Standards Differ Across Different Systems
 - Conclusions & Points to Ponder
 - Summary – Global Data Architecture
- Conflicting Data Models
 - Each Platform Has Its Own Way of Managing Addresses
 - Best Solution is Normalized
 - Summary
- Data Islands & Gaps
 - Sales Gaps and Islands
 - Summary
- Homogenous Data vs. Heterogeneous Data
 - What's the Difference: Homogenous & Heterogeneous
 - Homogenous vs. Heterogeneous
 - How About This Hard-to-Process Data Set?
 - Processing Heterogeneous Data
 - Summary
- How to Integrate Heterogeneous and Homogenous Data
 - Schema Integration
 - Schema Integration Flow Chart
 - Schema Integration Artifacts
 - Final Data Integrations Architecture
 - Global Distributed Transactions
 - Summary
- Module Summary



DA-03 Operational Data Architecture Part 1: The Operational Data Landscape

Module 5: Master Data & Reference Data Examples (57 min)

- The Role of Reference & Master Data
- Master Data
 - Customer Master Data
 - Product Master Data
 - Address Master Data
 - Contact Master Data
 - Department Master Data
 - Employee Master Data
 - Employee Master Data Model
 - Asset Type Master (or Reference?) Data
 - Service Catalog Master Data
 - Master Data (Reference) Repository Model
 - Asset Management Model
 - Here is a Question...
 - Other Types of Master Data
 - Other Types of Master Data – Food Processing
 - Other Types of Master Data – Airline
 - Tools and Resources
 - Summary
- Application of Master Data
 - Master Data by Industry
 - Master Data by Process
 - Distributed Master & Reference Data in a Global Architecture
 - Master & Reference Data in an ODS Architecture
 - Summary
- Reference Data
 - Reminder
 - Application of Reference Data
 - A Detailed Look at Locations and Geography
 - Examples of Reference Data
 - Country Codes (ISO 3166)
 - Currency Codes (ISO 4217)
 - Calendar (Date and Time)
 - A Detailed Look at Calendars
 - Temperature Conversion Tables
 - Service Catalog Rate
 - Summary
- Module Summary

Module 6: Master & Reference Data Challenges (39 min)

- Management, Operational & Technology Challenges
 - Management Challenges
 - Roadmap – Part 1
 - Roadmap – Part 2



DA-03 Operational Data Architecture

Part 1: The Operational Data Landscape

- Project Planning Strategy
- Operational (& Technology) Challenges)
- Current State / future State Architecture
- Master & Reference Data Repository – Approach 1
- Master & Reference Data Repository – Approach 2
- Last But Not Least...
- Summary
- Data Quality Architecture
 - High Level Architecture
 - Data Quality Profiling
 - Data Cleansing
 - Data Cleansing – Address Example
 - Data Cleansing Process – Missing Postal Code
 - Data Quality Assessment Dashboard
 - Sample Data Quality Report
 - Summary
- Implementing a Data Quality Technology Strategy
 - Implementing a Data Quality Technology Processes
 - Summary
- Implementing a Data Quality Governance Model
 - Implementing a Data Quality Strategy
 - Issues That Drive Your Strategy
 - Summary
- Module Summary

Module 7: Summary & Conclusions (3 min)

- Course Overview
- Conclusions
- Next Steps