



Designing and Implementing Data Architecture Analytics

By

Dave Wells, Course Author

Jed Summerton, Instructor



Module 0. About the Course (7 mins)

Module 1. Legacy Data Management Constraints (15 mins)

- *Data Sources*
- *Data Flow and Processing Part 1 & 2*
 - Data Extraction and the Information Supply Chain
 - Data Transformation and the Information Supply Chain
- *Data Structure*
 - Data Structure and the Information Supply Chain
- *Growth and Infrastructure*
- *Use Cases*
 - Use Cases and the Information Supply Chain
- *Roles*
- *Relationships*
- *Dependencies*

Module 2. Analytics and Data Architecture Capabilities (27 mins)

- *Data and Processing*
 - Data Sources
 - Data Pipelines
 - Data Flexibility (It's a Pipeline Thing)
 - Low Latency and Real-Time Data (It's a Pipeline Thing)
 - Data Streaming-Multiple Pipelines and Multiple Latencies
- *Data Platforms*
 - On-Premises, Cloud, Multi-Cloud, and Edge
 - On-Premises, Cloud, Multi-Cloud, and Edge-What About Technical Debt
- *Data Governance*
 - Data Governance
 - Enterprise Data Catalog and Metadata Management
- *Data Consumption*
 - Data Access and Use Cases
- *Modernizing Data Architecture*
 - BI Architecture vs. Analytics Architecture
 - The Need to Modernize

Module 3. More Requirements for Analytics and Data Architecture (21 mins)

- *Twelve Requirements*
 - Focus on User Experience
 - Adaptable to Many Use Cases
 - Automation with AI/ML
 - Fault Tolerance and Resilience
 - Support All Data Types
 - Edge Data and Processing
 - Data Lake Support
 - Data and Information Products
 - Portability
 - Managed Services



DA-02: Designing and Implementing Data Architecture Analytics

- Technical Agility
- Data Warehouse and Data Lake Cohesion
- *Thirty Questions*
 - *30 Questions for Analytics Data Architecture*

Module 4. Data Architecture Design Patterns (46 mins)

- *Data Pipeline Patterns*
 - The Big Picture
 - Storage
 - Storage and Database Types
 - Processing
- *Data Warehouse and Data Lake Patterns*
 - Hub & Spoke Architecture
 - Bus Architecture
 - Hybrid Architecture
 - Data Lake Architecture
 - Data Lake Zone Patterns
 - Data Lake Characteristics
 - Data Warehouse Outside the Data Lake
 - Data Warehouse Inside the Data Lake
 - Data Warehouse in Front of the Data Lake
- *Master Data Management Patterns*
 - Master Data and Reference Data
 - Master Data Management (MDM) Functions
 - Master Data Registry
 - Master Data Repository – Consolidated
 - Master Data Repository – Synchronized
 - Master Data Services
 - Evolving MDM Architecture

Module 5. Data Management Architecture Frameworks (43 mins)

- *Data Lake*
 - Data Lake
 - Beyond the Data Lake (Data lake and More)
- *Data Fabric*
 - Data Fabric Functional Architecture
 - Data Fabric Technical Architecture
 - Data Fabric – Graph Enhances
 - Data Fabric – The Power of Graphs
 - Data Fabric – Graph Effects
- *Data Mesh*
 - Data Mesh Architecture
 - Data Mesh – Data Governance
 - Data Mesh – Interoperability
 - Data Mesh – “Independent” Data Domains
 - Data Mesh – Data Products
 - Data Mesh – Shared Infrastructure
 - Data Mesh – Architecture, Not Technology



DA-02: Designing and Implementing Data Architecture Analytics

- *Data Network*
 - Data Network – Application-Driven Data Silos
 - Data Network – Integration vs. Network
 - Data Network – Conceptual Architecture
- *Data Services*
 - Data Services – Details & Decoupling
 - Data Services – A Data Access Framework
 - Data Services with Data Lake
 - Data Services with Data Fabric
 - Data Services with Data Mesh

Module 6. Defining Your Architecture (44 mins)

- *Step-by-Step Process*
 - Four Steps to Architecture Design
 - Four Steps: Details, as a “Double V” Model
- *Business Capabilities and Requirements*
 - Data: A Core Business Factor of Production
 - Data-Drive Strategic Pyramid
 - Balanced Scorecard
 - Understand Your Position
 - Quantifying and Prioritizing and Aligned Model
 - Business Capabilities – What Are They?
 - Business Capabilities – An Implementation Perspective
 - Business Capabilities – Identify & Describe
 - Business Capabilities – An Example
 - Business Requirements – Identify & Describe
 - Business Requirements – What Are They?
 - Business Requirements – Expanding on Capabilities
 - Business Requirements – An Example
 - Business Requirements – An Example, Extended to Use Cases
 - Use Case Reasons: 5 Reasons
- *Data Capabilities and Requirements*
 - Data Capabilities – What Are They?
 - Data Capabilities – What Else?
 - Data Capabilities – More to Consider
 - Organize Capabilities and Requirements into Groups
 - Data Capabilities – An Implementation Perspective
 - Data Capabilities – Extending to Data Management Requirements
 - Data Capabilities – Identify & Describe
 - Data Capabilities – An Example
 - Architecture Features – An Example
 - Data Management Requirements – An Example
 - Data Capabilities & Requirements – Putting It All Together

Module 7. Designing Your Architecture (36 mins)

- *Apply Framework and Design Patterns*
 - Applying Frameworks – Lake, Fabric, and Mesh
 - Applying Design Patterns – Data Warehousing
 - Evolving MDM Architecture
 - Applying Design Patterns – Data Pipelines



DA-02: Designing and Implementing Data Architecture Analytics

- *Adapting a Reference Architecture*
 - Evaluating and Using Reference Architecture
 - Adapting Reference Architecture – Step-by-Step
 - Select a Reference Architecture (4.1)
 - Reference Architecture – Conceptual Level
 - Reference Architecture – Functional Level
 - Reference Architecture – Technical Level
 - Adapt the Language to Your Terminology (4.2)
 - Map Business Capabilities & Identify Gaps (4.3 – 4.4)
 - Map Data Capabilities & Identify Gaps (4.5 – 4.6)
 - Revise and Refine (4.7) – Filling Gaps and Capturing Details
 - Revise and Refine (4.7) – Clear, Crisp, Understandable
 - Six Additional Steps

Module 8. Testing and Implementing Your Architecture (23 mins)

- *Testing the Architecture*
 - Testing the Architecture (4.8)
 - Testing with Business Requirements
 - Testing with Data Capabilities and Requirements
- *Guiding Principles*
 - Guiding Principles – What and Why
 - Guiding Principles – Some Examples
- *Implementing the Architecture*
 - Six Approaches to Implementation
 - Mix and Match Implementation
 - Implementation Road Map