Master Reference Data Strategies for SOA-Based Global Business Operations

Naeem Hashmi
Chief Research Officer
Information Framework
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Agenda

- Evolving Global Business Models
- Enterprise Architecture & Governance
- Master and Reference Data Management Strategies
- Q&A
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- Enterprise Architecture & Governance
- Master and Reference Data Management Strategies
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What is already happening?

- India Becoming Service & Research Center of the World
- China Becoming Manufacturing Center of the World
- More than 2/3 of the world population lives in Asia
- Drag & Drop to Sense & Act Paradigm
- Multimedia Driven Business
- Intense Instant Communication - mobility
Information Convergence Path
Two different approaches

**Data Centric: Structured – Old Pattern**
- Data Integration – Reference and Master Data
- Business Intelligence - reporting and analytics
- Feed-back approach
  - *Data Centric* – Corporate Information Factory (CIF)
  - Today’s MDM - CDI

**Information Centric: Unstructured – New Pattern**
- Content Integration at websites (WCM)
- Navigation, taxonomy, ontology, Aggregation, consolidation, multimedia (Portals)
- Access, Search, Visualization
- Information Fusion approach
  - *Information Centric* - Information Architecture (IA)
  - Integrated/embedded and distributed
  - Reference Orientation
Agenda

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Why an Enterprise Architecture?

“A Beautiful and Solid Building is as good as its Vision, Architecture, Framework and Foundation”

Interestingly same is true for the Information Systems...

- Vision
- Architecture
- Framework
- Foundation

The “Enterprise Architecture” defines distinct abstract layers containing specific capabilities that business requires to fulfill its obligations.
• Architectural Domains
  – Business
    • How is business conducted?
  – Organization
    • Who will conduct the business?
  – Technology
    • What are means of doing business?
  – Information
    • How everyone stays informed?
  – Governance
    • Are we doing things the way we are supposed to in a truest fashion?
Enterprise Architecture Hierarchy

Enterprise Architecture (EA)

Information Architecture (IA)

Vision & Scope

Principles

Standards

Governance

Business Model

Solution Architecture

Information Resources

Integration Architecture

Content Architecture

Technology Architecture

Application Architecture

Strategic Plan

Operating Plan

ARCHITECTURAL MODEL

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The Enterprise Governance

Enterprise Governance

- Legal
- Compliance
- Stakeholders
- Fiscal
- Performance
- Social

RISKS

Processes/Resources

Enterprise Architecture

Enterprise IT Architecture

IT Governance

- Audit
- Control
- Management

Infrastructure

Source: Governance Aspects of Enterprise Architectures by Naeem Hashmi
Styles of IT Governance

• **Business Monarchy**
  – C-Level business Execs and Committee of Senior business executives and possible a CIO

• **IT Monarchy**
  – IT Executives Only

• **Feudal**
  – Business Units Leaders and Process Owners

• **Federal**
  – C-Level Execs and at least one other business group

• **IT Duopoly**
  – Two Party arrangement between an IT Execs and at least one business group

• **Anarchy**
  – Everyone small or large

Source: Tom Davenport, Peter Weill
## Business Decision for Governance

### Top 3 Performers

<table>
<thead>
<tr>
<th>Domain</th>
<th>IT Principles</th>
<th>IT Architecture</th>
<th>IT Infrastructure</th>
<th>Business Application Needs</th>
<th>IT Investment and Prioritization</th>
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1. Profit Oriented Governance Model
2. Asset Utilization Governance Model
3. Growth Oriented Governance Model

Business Decision for IT Governance

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1. Profit Oriented Governance Model
2. Asset Utilization Governance Model
3. Growth Oriented Governance Model
What Governance has to do with Reference Data?

- Style of governance dictate
  - Ownership
  - Control
  - Accountability
  - Solution Architecture
  - Deployment Strategy

The SOA approach can simply the solution architecture but at the same time will add complexities when deployed globally !!!
What is Service Oriented Architecture (SOA)?

- An architecture that uses common standards to represent software assets as services.
- The “Services” in SOA are business services (Create an Order).
- A business solution is composed using ‘Services’ without knowing who (which application) will fulfill the request.
- Services are ‘orchestrated’ to choreograph complete business process (order-to-cash process).
- Services conform to some industry standards to make re-usability possible.
- Allows business to configure processes easily – adds agility.
- Loosely coupled (binding at run-time).

Presentation
Business Processes
Services
Components
Core Applications
Infrastructure

<table>
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<tr>
<th>Presentation</th>
<th>Business Processes</th>
<th>Services</th>
<th>Components</th>
<th>Core Applications</th>
<th>Infrastructure</th>
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</table>
Service Orientation

- Service-Orientation adds extreme complexities because each application is broken into autonomous capabilities [services] requiring unique Service-Level-Agreement [contract], governance model that may or many not be part of the parent process itself (intra service-communication).

- More services a ‘process’ has to communicate with, more risk you will add in your business process-chain

- The grain of the Service defines the business process agility and governance scope.

- Finer the service grain, more flexibility you add in defining innovative business processes. At the same time the fine-grained services add additional risks and extreme complexities in defining governance models for innovative processes (such as composite applications).
Agenda

- Evolving Global Business Models
- Enterprise Architecture & Governance
- Master and Reference Data Management Strategies
- Q&A
What is Reference Data?

- In business context, reference data usually means
  - A set of standards data elements and their values
  - Data structures/models (used for Master Data)
  - Industry agreed/accepted norms
  - Benchmarks
  - Formulas
  - ...
  - Standards
  - Compliance
  - Regulations
  - International
What is Master Data Management?

- In business domain, MDM usually refers to the life-cycle of the following business entities:
  - Customers
  - Products
  - Vendors
  - Employees
  - ...

- Based on a Reference Data Model

- Example: Customer Data Integration (CDI) primarily deals with the customer domain life-cycle:
  - A subset of MDM around Customer activities
  - Mostly Business Intelligence perspective
Typical Enterprise Data Domain

- **Static**
  - **Reference Data**
    - Lookup Data, UOM, Hierarchies, Industry Metrics
    - Employee, Business Partner, Plant Layout
  - **Configuration Data**
    - Defines your Enterprise Boundaries, Localized Plant Configuration
  - **Master Data**
    - Reference Data used in Transaction Systems (Customer, Supplier, Material)

- **Stable**
  - **Conditional Master Data**
    - Derived Reference Content in Transactions (Pricing based on SLAs)

- **Semi-Stable**
  - **Transaction Data**
    - Actual Reference Content in Transaction (material/price in a purchase/sales order)

- **Dynamic**
  - **Exchange Data**
    - Information Sharing across business apps to complete a process chain (order-to-cash process, ETL for DW/BI)
  - **Reporting Data**
    - Specific Process related data reporting as well as enterprise wide aggregated data (company P&L, Order Backlog, sales forecast)

- **Volatile**
  - **Analytics Data**
    - Strategic and predictive analytics. Feedback discoveries/rules back to the transaction/strategy planning systems (Risks, CLTV)

The Volatility, Timeliness, Governance and Volumes determines how/when/where Reference/Master data is to be deployed in an enterprise
Business Events and Data Layers

**Intra-Business-Process – Real-time**
- B2B, B2C, Credit Verification, New/Change Orders, Collaborative Reference Data

**Operational**
- To maintain control over day to day transactions
  - Over-Due Orders, Orders on Hold, Stock Inventories, Localized Master Data

**Management**
- Assist in Analysis of measurements based on key business performance indicators/metrics, KPI, Balanced Score Cards
  - Orders & backlog Reporting, profitability Analysis, variance analysis, performance vs. plan, Master Data

**Enterprise wide Reporting and Analysis**
- Historical trends across multiple Business Units, Enterprise Wide Reporting, Data Mining
  - Assist in Analysis of measurements based on key business performance indicators/metrics, KPI, Balanced Score Cards, Long Term business planning, Past Trends, Strategic Planning, Legal Reporting, Long Term Data Retention, Data Consolidation, Detailed Atomic Data, Master Data, Reference data
Industry role of Reference Data

• Reference data is governed by industry accepted standards

• Example. Without standardization of reference data, the securities industry could not process the intense global client service requirements.

• In financial industry, reference data is the fundamental data element for defining customers, securities and transactions that flow through the world’s financial systems.

• Without this common (reference) data, Trading, Clearing and settling securities transactions would not be possible.
# Master Reference Data Standards

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<th>Standard</th>
<th>Description</th>
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Global Trade Reference Data Standards
Business Processes/Standards Relationship

- Under global business processes, success of MRD strategy depends on which business processes are executed where and what compliance/governance elements are required at each process (service) step.
- You must follow the industry defined MRD standards.
- The SOA can make such implementation somewhat easier.

Source: The road to standards Nirvana, by Martin Sexton, handbook of world Stock, Derivative & Commodity Exchanges, p xcii
Centralized MRD/MDM Model

- All Master and Reference Data is generated, managed and delivered from a central Organization
  - The MRD is then pushed out to remote applications for internal use
  - Applications access MRD from central hub at run-time
- No new data is created/modified/deleted in the applications

**Benefits:**
- Consistency, Quality and Good Governance
- Good for Asset Utilization Business Model
- Works well for Small-Mid Enterprises

**Drawbacks:**
- Expensive proposition – timeliness, applications modification
- Hard to implement in global business operation except when companies run their business on ERP systems
Federated MRD Model

- Most of the Enterprise Reference Data is generated, managed and delivered from a central Organization
  - The MRD is then pushed out to remote applications
  - MDM processes are handled locally
- Limited Reference data is created/modified/deleted in the applications
- Requires new MRD, when needed, to be sent back to the central organization
- Benefits:
  - Compliance level data Consistency and Quality
  - Semi-autonomous business entities
  - Quick resource utilization (Mergers & Acquisition)
  - Outsourced business model
- Drawbacks:
  - Expensive proposition – timeliness, applications modification
  - Hard to implement for global operation
  - Complex Governance model
Partial MR model/templates are generated, managed and delivered from a central Organization
  - The MRD is then pushed out to remote applications
  - MDM processes are handled locally
Most of Reference data is created/modified/deleted in the applications
Any exception to the rules are coordinated with the central governance organization
**Benefits:**
  - Good for global business operation
  - Increase agility for semi-autonomous business entities
  - Quick resource utilization (Mergers & Acquisition)
  - Outsourced business model
**Drawbacks:**
  - Adds global compliance management complexities
  - Requires good content harmonization model when enterprise wide information is required
ERPs to simplify MRD/MDM challenges

• Today ERPs are no longer what they used to be – no more black boxes
• SOA has changed their reach beyond tradition ‘ERP’ processes - composite solutions
• ERP vendors also providing MDM/CDI infrastructure
• ERP vendors bring MDM/CDI right within the business processes, where it should be

• Most Importantly, ERP implementations force you to think through governance and architecture models before actual implementation - MRM/MDM is part of this process

• ERPs provide relevant MRD standards/templates for most Industry specific business operations

• ERPs force you to agree on some sort of standardization across the enterprise
  – Common Vocabulary
  – Terms
  – business processes
  – Interfaces
  – Hierarchies
  – Reference Data
MRD Management Process

- Identify business processes
- Identify ‘Static’ data usage (life-cycle)
- Assess risks/compliance requirements
- Identify governance requirements
- Use industry standard specifications
- Assess quality requirements vs. cost/risk
- Internalize business architecture
- Evaluate IT infrastructure
- Use ‘services’ approach for MRD implementation
Master Reference Data Management Challenges in Global Business Operations

- **Trust**
  - Security
  - Privacy
  - Authentication

- **Example: Customer Data Domain**
  - Customer Lists
  - Health Information
  - Intellectual Property
  - Social Security No
  - Credit Cards

- **Geo-Dimension (Culture)**
  - Different part of the world have different views on Trust
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Questions

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