Enterprise Master Data Management
Architectural Aspects

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Agenda

- Requirements – EMDM Applicability
- Framework, Principles & Architecture Vision
- Business, Information & technology Architectures
- Opportunities and Solutions
- Migration Planning, Implementation Governance & Change management
- Best Practices
Applicability of EMDM

- Organizations, specifically, retailers and manufacturers have made many efforts to improve product flow – lean manufacturing, floor-ready merchandise, etc.
- However, the processes for information flow fall behind improvements in the supply chain flow.
- Delays caused by incomplete and inaccurate information limit trading partners’ ability to capitalize on improvements in the physical supply chain.

<table>
<thead>
<tr>
<th>Category</th>
<th>Industry Trends</th>
<th>Implications</th>
</tr>
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<tbody>
<tr>
<td>Compliance Needs &amp; Emerging Global standards</td>
<td>Basel II, Sarbanes-Oxley, HIPAA etc safeguard the data and assign ownership; focus on data quality Global standards like GDS</td>
<td>Solutions that trigger change in data management processes Bring key data elements into centralized control and define common view of key data elements</td>
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<tr>
<td>Mergers and Acquisitions</td>
<td>More sources of master data Leveraging Knowledge embedded in key master data across partners</td>
<td>Improve cross sell Negotiate better with vendors Eliminate pricing mismatch</td>
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<tr>
<td>Operational efficiency Improvements &amp; enterprise initiatives</td>
<td>Increasing competitiveness Reduce latency; right data at right time Enterprise initiatives like RFID</td>
<td>Reducing time to market Improving supply chain interactions</td>
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<tr>
<td>Increasing Customer needs</td>
<td>Customer demands; reducing loyalty Considering master data as strategic asset</td>
<td>Ability to offer superior services Increase accuracy with single view</td>
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Win in the flat world
Business Context / Problem Context

- Problems with master data cause companies to under perform when transacting business with suppliers and customers.
- Each business unit of a company has different representations of item and vendor numbers, resulting in inability to leverage its scale and hence reduce procurement costs from its vendors.
- Because an online specialty foods retailer had a very manual item setup process, it took over thirty days to introduce new items. This was very frustrating for vendors and as a result, many decided not to continue to do business.

- There’s no single enterprise view of customer, vendor or product.
- Senior management request for information requires intensive manual effort to respond, and far longer than desired.
- Low return on technology investments; higher operational costs.
- No ownership of data; difficulty in complying with regulatory requirements.
- Inability to keep up with volume, pace and variety of data.
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**EMDM Architecture Framework**

**Business Architecture**
Describes the business strategy, models, processes, services and organizations. Provides the foundation upon which the other enterprise architecture dimensions base their decisions.

**Technical Architecture**
Defines the strategies and standards for technologies and methods used to develop, execute and operate the Application Architecture.

**Information Architecture**
Identifies, documents and manages the information needs of the enterprise. Assigns ownership and accountability for the information and describes how data is stored by and exchanged between stakeholders.

**Application Architecture**
Defines the specification of technology enabled solution in support of the business architecture. Provides a view of how services should be bundled to support a business process.

**Architecture governance**
The practice and orientation by which enterprise architectures and other architectures are managed and controlled at an enterprise-wide level.
Architecture Principles

- Reduce load on mission critical systems
- Provide for different means of Master Data integration, combination of EAI, ETL & EII
- Separate functional concerns of OLTP, OLAP and MDM
- Non intrusive syndication
- Ease of other systems doing data stewardship
Architecture Vision - Four building blocks for EMDM

1. Streamlined Master Data Processes & Workflows
   - Setup
   - Delete
   - Inactive
   - Maintain

2. Master Data Repository & Internal Synch
   - Setup
   - Delete
   - MDM
   - Maintain
   - Analytical Systems
   - Planning Systems
   - Transaction Systems
   - Suppliers
   - Website
   - Product-Vendor Store Database

3. Electronic Data Synchronization w/ Vendors
   - Supplier A
   - Supplier B
   - Supplier C
   - Catalog
   - Vendor Portal
   - GDS
   - Master Data Repository

4. GTIN / GLN / EPC / Flexible Merchandise Hierarchy
   - Data Standards
   - Data Attributes
   - Data Hierarchies
   - EAN-14
   - EAN-13
   - EAN-8

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Typical Business Architecture

Note:
1. This workflow is applicable for Non-internet based channel for creation of a client of type Individual or legal entity.
2. Other workflows will cover the internet channel and creation of a client in workflows related to customer creation or service provider creation
3. A client group can be created. This workflow does not cover the group scenario.

To Be: Acquire/Create Client
It is important to leverage existing technologies, while integrating new ones.

Since different technology tools are needed to develop a comprehensive Master Data foundation, it is important to analyze alternatives and select appropriate tools as part of the MDM strategy.
Enterprise Master Data Management – Technical Architecture

UCCnet Repository

UCCnet Gateway
- FTP
- HTTP
- SMTP
- Protocol Mgmt & Workflow
- Translation & Adapter Layer

Partner Gateway
- FTP
- HTTP
- SMTP
- Protocol Mgmt & Workflow
- Translation & Adapter Layer

Vendor Portal

Master Data Management Process Automation
- Master Data Management Processes
- Workflow Automation
- Business Intelligence Tools
- Central Master Repository
- Process Monitoring & Management
- Workflow Modeling
- Process Repository

Enterprise Integration Backbone
- Event Management
- Translations
- Synchronization Rules
- Scheduler
- Data Extract & Load Mechanisms
- Routing
- Messaging
- Publish / Subscribe
- Request / Response

Exception Mgmt

Logging

Adapters

Enterprise Application (Remote @ Stores/DCs)

Application Master Data

Business Partners
- Paper Based Data
- Interactive Data Input
- Manual Input
- Data Requests & Authorizations
- Interactive Data Input
- Notifications & Master Data

Firewall

Notifications & Master Data

Business Users

Business Modeler
- Process & Data Modeling

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Opportunities & Solutions

- **Improve process efficiencies**
  - Getting some processes corrected and optimized
  - Collect process best practices

- **Improve execution efficiencies**
  - Speed up time to Shelf
  - Better support for data intensive applications

- **Better information management**
  - Reduce data administration costs
  - Improve product data accuracy
  - Collect industry best practice - data models, ER diagrams etc
  - Collect COTS product evaluation criteria & matrices
  - Identifying custom built components that can be built once & reused
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Steady state, “To Be”, governance model
Business and IT work together to ensure that Master Data provides business value across the enterprise
Change Management Considerations

Create the Migration Approach
- Should address key aspects of the migration exercise like: implications of this project on other projects and activities, products needed, organizational resources needed to develop the new components, cultural impact on the user community, and how can it be controlled, cost of retraining the users...

Determine the Migration Impact
- Example of aspects to be addressed: parallel operations, choices of proceeding with phased migration by subsystem or by function, impact of geographical separation on migration

Assess co-existence of legacy and new projects. The main problems with coexistence are:
- User Interfaces – combining UI to the old and new applications in a single unit on the users desk can be difficult if not impossible
- Access to data – the new applications need to share data with the old applications, this may be difficult unless the old and new systems use the same technology
- Connectivity – may involve expenditure on software and gateway equipment

Create a Migration/Implementation Roadmap
- Determine the future disposition of current systems
- Develop an estimated value to the business as well as key business drivers for each subproject
- Create a project by project implementation plan

Identify the relevant governance groups and organize them along process area, process category and roles.

Example of Process Areas:
- Enterprise business groups
- Operate & Sustain
- Create & Change

Example of Category:
- Data Availability
- Data Quality
- Monitoring
- System Administration

Identify the key change management processes and group them into relevant functional modules

Example of Functional Module:
- Create
- Operate/Sustain
- Change
- Sunset

Map governance roles and positions to all change management processes
Provide detailed description of each role activities and responsibilities
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# Master Data Management best practices

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<th>BEST PRACTICE</th>
<th>DESCRIPTION</th>
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| • Establish clear objectives for master data initiatives & secure strong business & IT alignment | • Identify business capabilities desired and role of master data management  
• Obtain executive sponsorship and ensure participation of both business and IT team |
| • Streamline master data life cycle processes, and automate using workflows     | • Streamline item life cycle processes e.g. (item introduction to item deletion)  
• Consider developing integrated new item process  
• Automate to provide alerts and exception management.  
• Clearly establish data ownership to establish accountability for data accuracy |
| • Electronically obtain master data from trading partners                       | • Leverage opportunities to obtain master data from trading partners through global data synchronization and vendor portals and minimize manual input |
| • Deploy master data repository to offer one version of truth to enterprise     | • Design and deploy a master data repository that consolidates multiple master data sources  
• Include all data entities (item, customer, vendor etc) in the master item repository |
| • Ensure that the master data repository is not embedded in any application     | • Clearly separate master item repository from any application  
• All channels should access the same master data  
• Ensure robust internal synchronization to support access to multiple repositories across different channels |
| • Leverage one master repository for providing one version of truth to all channels | • Account for dependencies between master data and pricing execution activities  
• Focus on streamlining back-end processes related to communicating master data to relevant applications  
• Analyze back-end processes on proactive basis and address any bottlenecks |
| • Identify dependencies between master data and pricing                        | • Ensure master data numbering does not have built in intelligence. |
| • Ensure robust internal synchronization                                       |                                                                                               |
| • Do not build intelligence into the numbering system                          |                                                                                               |
Data Quality Best Practices

Data Qualities

Correct
The values and description in the data describe their associated objects truthfully

Unambiguous
The values and descriptions in data can be taken to have only one meaning

Consistent
The values and description in data use one constant notational convention to convey their meaning

Complete
Ensuring that the individual values and descriptions in data are defined. Ensuring that the aggregate number of records is complete

Data Quality Questions

• Data Quality improvement must be based on rigorous measurements. After analyzing the measurements it should be possible to answer questions like:
  • Is data quality getting better or worse?
  • Which source systems generate the most/least quality issues?
  • Are there any interesting patterns or trends revealed in scrutinizing the data quality issue over time?
  • Is there any correlation observable between data-quality levels and the performance of the organization as a whole?
  • Which of my data quality jobs consume the most/least time in my ETL window?
  • Are there data-quality filters that can be retired because the type of issues that they uncover no longer appear in our data?

Data Quality Objectives

• Be Thorough – The data-cleaning subsystems is under tremendous pressure to be thorough in its detection, correction, and documentation of the quality of the information it publishes to the business community.

• Be Fast – The whole ETL pipeline is under tremendous pressure to process ever-growing volumes of data in ever-shrinking volumes of time

• Be Corrective – Correcting data-quality problems is the only strategically defensible way to improve the information assets of the organization. The data warehouse team might be the first to discover data quality issues that have been missed for years

• Be Transparent – The data warehouse must expose the defects and draw attention to systems and businesses practices that the data quality of the organization

Data Quality Activities

Measure Monitor
Analyze Parse
Standardize Correct
Enhance Match
Consolidate Monitor
Questions & Answers

Thank you