Dow's Master Data Management Business Processes

Chemical Industry SAP Users Group (CISUG)

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Information Systems

Agenda

• Background – Master Data Management at Dow
• Data Architecture, Strategy and Roadmap
• Master Data Management
• Data Governance
Global Codes Introduction

Historic view on global codes in Dow

‘Global codes are the key cornerstones to achieve integration of transaction systems, and enable reporting across functions and businesses.’

• 1970’s and 80’s:
  Area codes (e.g. Product, Customer, Market hierarchy), supporting local / area applications

• Late 80’s - early 90’s:
  Created global codes to support SAP-R2 implementations
  Implemented global Codes Admin system (INCA) to centrally maintain and distribute codes data (globally common data segments)

• Late 90’s:
  Further explore use of global codes in other global applications (Data Warehouse) and for other work processes, like Market/Sell, Manufacturing, etc.

Note: Reference data = Codes data = Master data
Existing Master Data Objects

- Customer
- Supplier
- Employee
- Contractor
- Global Material
- General Ledger
- Country
- Primary Geopolitical Subdivision
- Secondary Geopolitical Subdivision
- Place (City)
- Site Group
- Site
- Facility
- Area Management Group
- Area Management Group
- Language
- Substance
- Currency
- Cost Center
- Business Structure
- Industry Structure
- Work Process
- Function
- Client
- Company
- Unit of Measure
- Payment Term
- Planned Product
- Trade Product
Data Architecture Principles
Data Principles

Data architecture is based on a foundation of principles that govern data integration / sharing.

- Shared Data is an Enterprise Resource
- Data Administration
- Data Ownership
- System of Record
- Reference Environment
- Reference Code
- Meta-data Repository
- Meta-data Content

Ensure Alignment Between Data Principles and Project Design
Shared Data Strategy

Data that spans more than one application or Dow work process and/or is exchanged with parties external of the enterprise.

**Federated** – Data that is *shared/exchanged* between Dow and any external party.

**Enterprise** – Data that is *shared/exchanged internally* within Dow, across *more than one Work Process*.

**Work process** – Data that is *shared/exchanged* across more than one application *within one work process*.

The goal is to document those data objects (data subjects/entities, etc.) that are both **basic and critical** to the business.

- By **basic**, we mean that it is probably mentioned many times a day in normal conversation.
- By **critical**, we mean that the business would be nonexistent, or completely different without this concept.
**Data Architecture Roadmap: 2015**

**Data Architecture Vision**

Best in class delivery of the right information at the right time, in the right place for the right party, to make informed and timely decisions.

**Mission**

Reusable, accurate, integrated and reliable information to support business activities.

### Data Architecture Elements of Solution

<table>
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<tr>
<th>Governance</th>
<th>Information Sharing (Reuse)</th>
<th>Interoperability</th>
<th>Data Access</th>
<th>Data Quality</th>
<th>Practices &amp; Standards</th>
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</thead>
<tbody>
<tr>
<td>• Establish data ownership along with data stewardship roles and responsibilities to proactively manage information risk, regulatory compliance and ensure enterprise shared data is “fit for purpose”.</td>
<td>• Encourage the leverage and reuse of business critical data across the extended enterprise.</td>
<td>• Leverage service provider solutions and proactively work with partners, suppliers and standards organization to facilitate adoption of industry standards.</td>
<td>• Security data classifications and functional roles drive the access authorization process. Classification of data is required in order to define roles and access levels to ensure the right data to right people.</td>
<td>• Establish data quality measures for all business critical data assets, regardless of data type. Implement control plans to ensure the data is routinely audited and “fit for purpose”.</td>
<td>• Establish management practices, guidelines and standards to ensure long-term sustainability.</td>
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</table>
World Map View: In much the same way a world map is used to show the continents, nations, bodies of water and their relationships, the corporate data model is used to show all of the concepts or subject areas of a corporation and their relationships (i.e. show the “big picture” for the enterprise).

Comprehensive: The existing CDM really represents only a Reference data (INCA) view of the enterprise. There had been no attempt to date, to document the key business transaction related data entities or relationships that the corporation depends on to operate.

End-to-End Process: Although still a work in progress, this streamlined conceptual data model depicts both the reference and transaction subject data areas, along with their key inter-relationships. Using this model, you can walk through the high level end-to-end process flows of:

**Lead**
- Objective to Organization
- Capital to Competency
- Stimulus to Strategy

**Manage**
- Order to Cash
- Procure to Pay
- Raw Material to Finished Good
- Concept to Production
- Requirements to Resource
- Threat to Response

Use: The intended audience for this model includes: the architect team, SA’s, LAS’s, CMIT’s and Program Managers. We can leverage this model to get agreement on the meaning of data subjects and relationships (context), perform high-level impact analysis, project scoping and opportunities for data reuse (planning), to resolve name and definition clashes and relationship conflicts (issue resolution).
What are we trying to manage? Layered Data Hierarchy

- **Reporting**
  - Historical

- **Transaction Data**
  - Transactional
  - How the data will behave in the transaction systems

- **Conditional Master Data**
  - Dynamic
  - Data applies only in specific situations (if this customer & material, than this price)

- **Master Data**
  - Stable
  - Master Data defines the structure and how it behaves in the transaction systems

- **Reference / Configurable Data**
  - Static
  - Configuration data defines your system and limits of all the elements

**Data Types**
- **Static**
- **Stable**
- **Dynamic**
- **Transactional**
- **Historical**

**Key Data Areas**
- **Sales Reports, Inventory, etc.**
- **Purchase Orders, Sales Orders**
- **Pricing, BOMs**
- **Material, Customer, Person**
- **Order Type, Plant Configuration**
- **50+ MDM Objects**
- **Next Generation Opportunities**
- **2000 R/2 Tables**
- **KPI’s, Hierarchies, Categories and reporting dimensions**

**Reference**
- PWC MDM 01/2006
Master Data Management
Master Data Management is a set of disciplines, technologies, and solutions used to create and maintain consistent, complete, contextual and accurate business data for all stakeholders (users, and applications) across and beyond the enterprise warehouse.

For All Types of Master Data
...products, organizations, locations, trading partners, employees, customers, equipment, assets, accounts, policies...

Reference: IBM SOA and MDM Overview – 01/2006
Review of MDM definition / objectives

- **Master Data Management (MDM)** is both a business strategy and a technical solution.

- Master Data Management includes the:
  
  | People/organization | 80% |
  | Processes and       |     |
  | Technology          | 20% |

  used to administer and govern reference data shared and exchanged across the extended enterprise.

- A Master Data Management strategy and solution are critical to managing corporate information in a consistent, controlled, and “single-view” capable manner.
MDM Components

- People / Organization
  - Data Ownership, stewardship, roles and responsibilities

- Process
  - Create, Update, Discontinue, Outsee, Archive, Purge

- Technology
  1. Code Maintenance (supporting Dow business requirements)
  2. Data Quality (profile, analyze (gaps), cleanse and monitor)
  3. Data Integration (load, distribute, replicate and retrieve)
  4. Metadata (business and technical documentation)
What is a Global Code?

- Globally common master / reference data
  - Customer, Supplier, Material, Product Hierarchy…

- Globally common attributes
  - Customer: Name, Address, Corporate HQ…
  - Material: Name, Characteristics, Class, UofM…

- Application agnostic

- Identical for every legal and business entity

- Enterprise KPI’s / reporting dimensions

Administered on a global basis
MDM Strategic Direction - Summary

• Master/reference Data (Enterprise Shared Data) is application agnostic
• Principle of “One”:
  » Single system of record for each data object
  » Single data owner for each data object
  » Single, unique code for each data object instance
  » Single system of reference, providing a single view of each data instance for the enterprise (data hub)
  » Single data definition - values represent the same meaning across all systems and files
  » Single data format (data standard) for each data object
  » Data flows in a single direction, from data source to the system of reference

• Consistent:
  » operating discipline (GCEC Best Practices)
  » tools (maintenance, DQ/Cleansing, Distribution, Replication)
  » process (maintenance, distribution, replication, audit trail, ILC mgmt)
  » data content across:
    • Legal Entities, Work Processes, Applications, Instances, Clients, Companies, Plants,

• Data is optimized for data consumption vs. data capture
  » Presentation of information for Legal / regulatory requirements takes precedence over Dow management requirements
• Establish the vision, strategy, principles, and controls

Strategy / Approach

Distribute

Identify

• Identify source systems and system of record

• Combines unique data elements from matched records into a single source

MDM - Data Quality Framework

Source

Normalise

Validate

Enrich

Match

Consolidate

Assess

Measure

(Monitor)

Analyze

(Cleanse)

Improve

(Enrich/Augment)

Control

Government

• Analyse the nature of the data and category (federated, enterprise, work process, app)

• Identifies and isolates the data elements in data structures

• Standardise data values and formats according to business rules (includes 3rd Party references)

• Corrects, verifies, cleanses and appends data based on a set of algorithms

• Enhances the data by appending value-added information

• Searches and identifies duplicate records

• Combines unique data elements from matched records into a single source

• Qualifies and quantifies the number and types of defects

• Provides reporting about data quality and status
Strategy: Dominant Master Data Source

Single system of record for each master data object, controlled distribution and replication via consistent publish and subscribe rules.

Enterprise-wide common data objects and attributes are maintained in an application agnostic system.

Transaction systems add “localized data” to the enterprise common data.

Transaction systems can be the system of record for unique master data.

“Single view” of Master Data available in the data warehouse (data hub)
Candidate New Master Data Objects

- Person
- Equipment
- MRO Commodity (Catalog Items)
- Equipment Groups
- Equipment Specification
- Parts Management
- Manufacturers
- Parts
- Warehouse
- Warehouse Item
- Hierarchies, Reporting Structures

- User
- Building
- Region / Territory
- Substance
- Container
- Transportation Type
- Organization
- Contact Mechanism
- SAP Organizational Structure
- New mySAP tables & Objects
- Others…TBD
Data Stewardship Roles & Responsibilities

Data Stewardship Steering Team

Project Team

Data Producers

Input of data in accordance with rules; front-line accountability for data quality

Technology

“X-Work Process alignment”

Strategy / Corp view

People & Process

“Work Process Aligned”

Definition / Rules

“Business and Shared Service Aligned”

Content / Execution

IT Architecture

Meeting business needs. Enabling business innovation.
Master Data Governance

- Global Codes Expertise Center
The Global Codes Expertise Center provides vision, direction, technology and support services needed to continuously improve the quality of Master Data. We also promote the integration of Master Data across Dow’s business systems and work processes to reduce operating costs and maximize data value.

The key objectives for the Global Codes activities includes:

- Create a model for staffing codes projects
- Establish well-defined roles and responsibilities
- Eliminate rework
- Standardize tools, policies and processes
- Reduce number of handoffs
- Improve timeliness and quality of decision-making
- Continue to improve codes process
- Key enabler for implementing in half-the-time, twice the volume, with equal quality
### Ownership versus Management of Data Subjects

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<th>Ownership</th>
<th>Supply Chain</th>
<th>Commercial</th>
<th>Procurement</th>
<th>Quality</th>
<th>Finance</th>
<th>Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes (Master Data)</td>
<td>Material Upper Structure Geo C&amp;D Bom’s Routings Freight Rates</td>
<td>Customer Contacts Field Seller and Industry Assignments</td>
<td>Vendor MRO Materials</td>
<td>SMC Titles</td>
<td>Liable Customer Cost Center World Area Currency Company</td>
<td>Facility Site Site Group</td>
</tr>
</tbody>
</table>

Implement, Support, Design, Technology, Systems, Improvement, Work Process MET, Training, Data Maintenance, Metrics, Monitoring
Master Data Management - Data Ownership

Procurement
Raw Materials, Packaging Materials, Vendor, Equipment, Spares, Capital, MRO – Contracts, Leases, Land,

Supply Chain
Commercial Materials, Geopolitical, Unit of Measure, Plan Level Data, BOM, s Routings, Freight Rates,

Record and Report
Business Upper structure, Plan Product, Company, Cost Center, Currency, Liable Customer, Payment Terms, Area Management Group…

EH&S
Substance, Hazardous Materials

Quality
Specified Material, Title

Market / Sell
Customer, Trade Product, Field Seller Assignments, Industry Assignments

Manufacturing
Facility, Site, Site Group

Human Resources
Employee Number

Develop & Commercialize Technology
Research & Development Material Coding
MDM Styles to be Considered

**Governance**
- Decentralized
- Centralized

**Stewardship**
- Siloed
- Enterprise Wide

**Maintenance**
- Operational App
- Application Agnostic

**Data Integration**
- None
- Real-time