

Master Data Management Framework: Begin With an End in Mind

by Bill Swanton and Dineli Samaraweera

Most companies know they have a problem with master data for their various transaction systems, but few have an overall plan for dealing with it. Cost and scope make a top-down solution impractical, especially for manufacturing and retail companies that rely on packaged software. Best practice is to make MDM improvement projects part of each significant business initiative with an explicit plan for piecing together a full solution over several years.

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Make MDM improvement projects part of each significant business initiative with an explicit plan and framework for piecing together a full solution over several years.

The
Bottom
Line

Manufacturing and Retail industries have unique requirements

Most companies know they have a problem with master data for their various transactional systems, but few have an overall plan for dealing with it. Manufacturing and retail companies can find few good examples because most Master Data Management (MDM) projects to date have been:

- In industries like Financial Services that rely heavily on custom software using code development-oriented solutions. A different set of tools is required if packaged applications, such as Enterprise Resource Planning (ERP), are the bulk of the portfolio.
- Applications with one-way data flows, such as Product Information Management (PIM) or data warehousing, that do not have to synchronize data between applications, only rationalize it for downstream use.

For more on this issue, see the AMR Research *Outlook* “Who Is Master of Which Master Data? Time To Coordinate,” September 1, 2004.

Hidden cost of master data problems

Regardless of which business processes or enterprise applications we study, master data is always an issue. As discussed in the *AMR Research Report* “Combining IT Cost Containment and Business Change Could Save Global Businesses \$1 Trillion,” September 2003, all major opportunities for system benefits hinge on a global view of customers, suppliers, and materials. Our research shows many common complaints:

- Delays and lost production during ERP go-live because the new system requires more complete and consistent master data
- Over 80% of support calls for supply chain planning traced to master data problems
- The inability to globally manage procurement of common materials
- Poor customer service due to a fragmented view across channels and geographies
- A fragmented view of business partners, unable to total how much they buy from and sell to your company
- Missed synergies from mergers and acquisitions

Even after master data is cleaned up, it can decay over time as duplication and incorrect values creep in. Simply centralizing master data isn't a solution; the work needs to be distributed over many different individuals, departments, and geographies.

Defining Master Data Management

Master Data Management is a system of business processes and technology components that ensures information about business objects, such as materials, products, employees, customers, suppliers, and assets, is current, consistent, and accurate wherever they are used inside or exchanged outside the enterprise.

Companies include different objects and data elements in their strategy, depending on how widely they are shared among organizations and enterprise applications. For example, process manufacturers may include material specifications and recipes.

The business process for master data is in many ways more important than the technical solution. Traditional enterprise applications treat master data, such as material masters, as static information, loaded once in a single form and used forever. The reality is more like the following:

- The data may not be transactional, but it does change frequently due to changing markets or continuous improvement projects.
- Different enterprise applications may need the same data elements.
- Dozens of departments and individuals are responsible for the different elements in a single object.

Master data architecture defines rules and responsibilities

Most companies we speak with have no formal data architecture or governance—master data issues are dealt with piecemeal. A few used a major project, such as an ERP consolidation or Global Data Synchronization Network (GDSN) implementation, to sell the importance of master data to executives. This creates the necessary business imperative to establish a master data governance process, a critical component of the AMR Research Master Data Management Framework, shown in Figure 1.

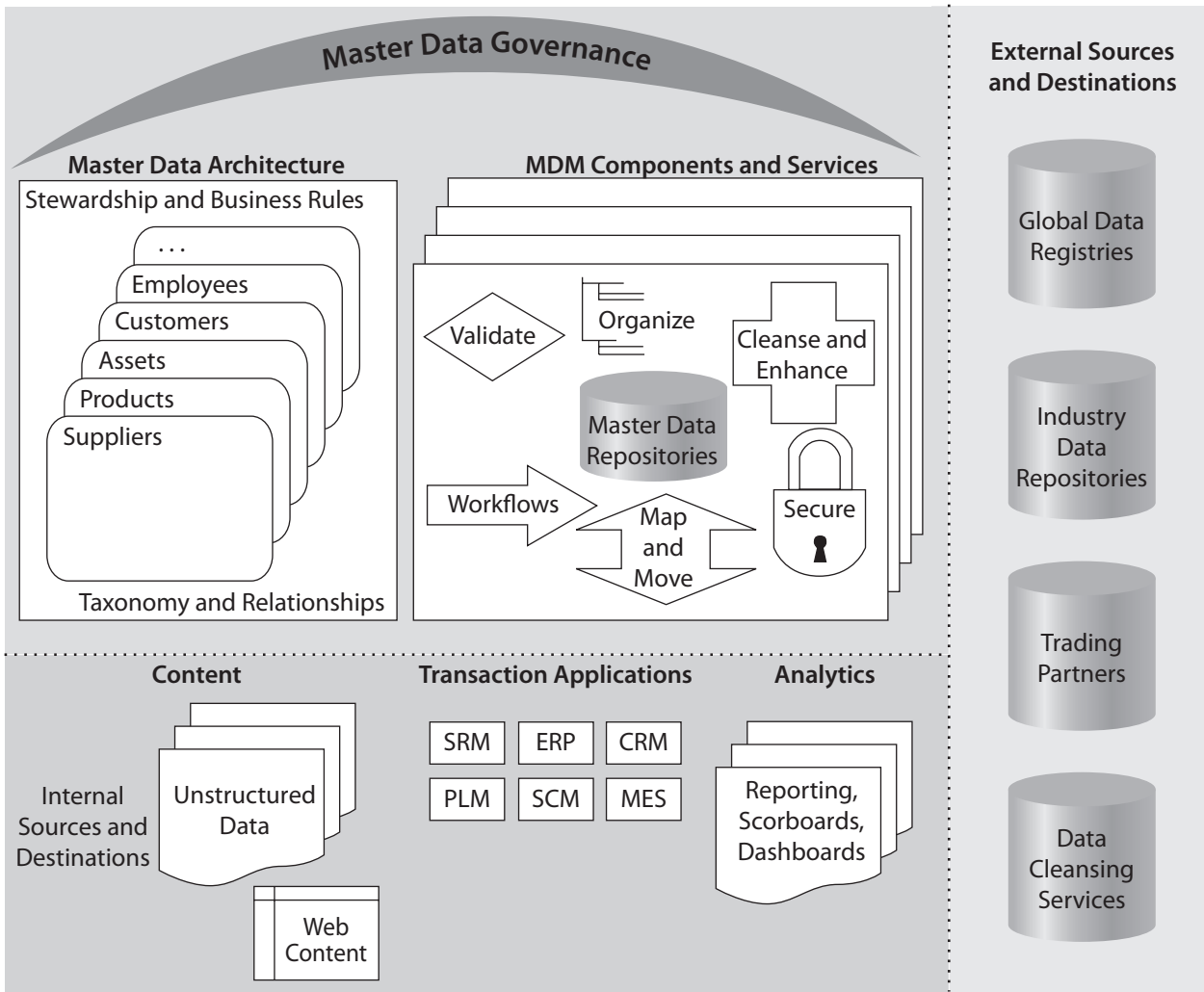
The data architecture is an explicit plan for master data that does the following:

- Identify the objects and data elements to be managed
- Specify the policies and business rules for how master data is created and maintained
- Describe any hierarchies, taxonomies, or other relationships important to organizing or classifying objects
- Explicitly assign data stewardship responsibility to individuals and organizations

Stewardship is a key word. Organizations can't "own" the data; they have to maintain it for the benefit of the whole company and its partners.

Companies usually fund their architectural work as part of a project for that class of object. For example, a strategic sourcing project might be given time and budget for creating the architecture documents for materials and suppliers as a project deliverable. This forces the team to broaden its scope to understand the needs of the whole company, and spreads the total cost over many projects and years.

Figure 1: Master data management framework



Source: AMR Research, 2005

Master data components keep data clean and consistent

Whether they originated in data warehousing, sourcing and procurement, Product Lifecycle Management (PLM), or ERP ecosystems, all master data efforts include a set of master data components to manage and manipulate master data. These tools may be embedded in an application like PLM, or layered on top for ERP. A master data management system for any object requires the following:

- **Master data repositories**—A trusted master for items, which contains a subset of attributes used by multiple systems.
- **Workflows**—Enforce stewardship policies and speed changes even in a highly distributed company, while maintaining an audit trail of changes.
- **Secure**—Control access, prevent unauthorized change, and enforce privacy regulations.
- **Cleanse and enhance**—Standardize attributes and enhance with data from other systems or external services to complete the record.
- **Organize**—Classify items in a taxonomy or hierarchy for analysis and to assign stewardship responsibility.
- **Validate**—Ensure all attributes (and attributes stored in target systems) are complete, consistent, and valid and measure the quality of the data.
- **Map and move**—Use Enterprise Application Integration (EAI) and Extraction, Transformation, and Loading (ETL) tools to interface to source and target systems.

Assemble technical solution as you tackle each class of objects

The *AMR Research Report* “Taking the PIM Path on the MDM Journey,” July 2005, shows how a specific business project, such as a mandate to publish product data to a GDSN, can be used to tackle the MDM problem one object at a time. As shown in the model, this results in a series of technical solutions, each using a set of master data components.

Purists may want to use a single set of tools and repositories for all objects, and vendors like **i2 Technologies** and **IBM** can support them. Many companies will find this impractical and, in any case, few will attack all data objects at once. PIM and sourcing applications often come with their own built-in tools. ERP systems may serve as the system of record for some master data, but need external tools to manage workflow and analytics. PLM tools can handle data modeling and have strong workflow capabilities.

We believe it is more important that the company explicitly think out and document the connections between the organization and the data objects and elements. It can then implement solutions deliberately one object at a time according to business need to avoid surprises and instill stewardship.

Extended business processes and SOAs will require a solid MDM strategy

Most companies awaken to the importance of MDM during a major ERP project, as formerly loosely coupled business processes, departments, and applications become tightly integrated and share master data. The promise of a Service-Oriented Architecture (SOA) is extended business processes that span many applications, roles, and companies. While an SOA will make master data integration and consistency checking technically easier, it will require an explicit understanding of where the system of record for master data resides and how it is shared. Implementing an MDM strategy will take several years. If you start now, you may be ready by the time you upgrade to the SOA-enabled version of your ERP platform.

Future Reports in this series will look deeper into the business case, a roadmap for implementation, alignment with other business improvement initiatives, service providers, and specific issues and approaches for each master data object.

Notes

Company List

i2 Technologies

www.i2.com

IBM

www.ibm.com

Acronyms and Abbreviations

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EAI	Enterprise Application Integration
ERP	Enterprise Resource Planning
ETL	Extraction, Transformation, Loading
GDSN	Global Data Synchronization Network
MDM	Master Data Management
PIM	Product Information Management
PLM	Product Lifecycle Management
SOA	Service-Oriented Architecture