
Master Data Management:

The Key to Leveraging Information

The Digital Tower of Babel

Master Data Management (MDM) is a response to the fact that—after a decade of enterprise application integration, enterprise information integration, and enterprise data warehousing—most large organizations still struggle with operational and reporting issues rooted in isolated silos of redundant and inconsistent data.

Neither the root of the problem nor its persistence is a mystery to anyone. For more than three decades, companies built standalone business systems department by department, creating separate data repositories of customer, product, supplier, partner, location, employee, accounting, and other organizational information, each with a similar but unique set of definitions and context. Even when the Internet made it obvious to everyone that all systems and data must eventually connect and communicate, urgency and expediency drove much new development to proceed in practical isolation. The problem has continued to worsen, even as many have struggled to address it.

Today, a convergence of requirements—for improved business performance, greater adaptability to constant change, and not least, legally verifiable reporting—is returning management's attention to the care and feeding of its data. Companies need to know where their information originates and resides, how it's defined, where it's consumed, and whether it can be trusted. MDM is a practical, efficient, and scalable response that allows companies to regain control of their core information assets.

Master Data and Its Management

Master data are the core facts that describe and define a business domain—its customers, products, suppliers, partners, accounts, locations, and employees. They do not define all of its data, but focus on the core information used repeatedly across many business units, systems, activities, and processes. These fundamental dimensions provide the context for every event that occurs within the business, and for every action it takes.

MDM is the set of disciplines, technologies, and solutions used to create and maintain accurate, complete, and up-to-date master data for all stakeholders. More process than product, MDM decouples master information from the applications where it originates.

It creates a central application- and process-independent master data resource that simplifies ongoing integration and development. It enables collaborative creation of the master data and data lifecycle management. In doing so, it ensures that master data is consistent across transactional and analytical systems, and resolves data quality issues proactively, rather than after the fact, in the data warehouse.

What's Driving MDM Today?

Many different developments and business pressures, both internal and external to the organization, are feeding the current interest in MDM.

The need to build a customer-centric business – Pick any industry and there's an ongoing internal debate about the best ways to refocus a large organization on the needs and expectations of its customers. Many companies have taken at least one stab at CRM, hoping to integrate their channel-centric customer views in a single new application package. Most of these efforts have delivered some new business value and operational functionality, but they've also created new silos of customer data.

The need to collaborate with value-chain partners – The need to exchange product data and other operating information with suppliers, contractors, shippers, and channel partners grows steadily more urgent as competitive pressures compress schedules and shrink budgets. Master data must be accurate and consistent across all the systems that link and synchronize the value chain.

The need to demonstrate regulatory compliance – Unreliable reporting has become much more than an operational liability. Executive management is now personally responsible for the integrity and accuracy of the organization's financial reporting. MDM helps ensure that the company's financial statement includes only true statements.

The need to facilitate SOA development – Many organizations are moving toward Service-Oriented Architectures (SOA) as a means of reducing development cycles and expense, repurposing legacy systems, and ensuring long-term infrastructure flexibility. But loosely coupled applications rapidly multiply the opportunities for mayhem if non-standardized data is allowed to flow freely between applications. An initial investment in data architecture is a prerequisite for an SOA to function effectively and scale across an enterprise environment.

Core Elements of an MDM Solution

MDM solutions must support three key types of uses. The owners of record for different types of data—product managers, for instance, or finance managers—will use the solution to manage the state, context, and definitions of that data. At the same time, operational systems and applications will interact with the MDM system to verify the accuracy and consistency of master data as it is used in routine transactions. Finally, analytical users will use the system to find and understand relationships between data objects: to learn, for instance, that two separate customers are members of the same household—an insight that may enhance the user's ability to market effectively to those customers.

To create and support these very different capabilities, several core components are required:

- **A master data management system** – This transactional, SOA-based middleware provides convenient, managed, and flexible access to both structured and unstructured enterprise reference data through business services that can be easily incorporated into key business processes and workflows. It provides a complete range of administrative services including user access interfaces, repository management functionality, and the process workflows and event management that support automated data creation, access, and maintenance.
- **Master data integration** – This is a middleware infrastructure that provides standards-based communication and integration services between the MDM system and other systems and applications, both within and beyond the enterprise.
- **Master data solutions** – These are the essential service components of any MDM solution. They include data modeling and architectural services that reflect industry-specific standards and best practices. Another key service component is the provision of integration templates that expedite the transformation and quality control of data as it moves from source systems to the MDM repository.

Business Impact of MDM

With all the components of an MDM solution in place, organizations can address and avoid the operational impacts of poor data quality that continue to plague businesses worldwide. Data quality issues cost U.S. businesses more than \$600 billion annually¹, and a recent Harris Interactive survey of European information workers shows that respondents spend as much as 30% of their week verifying the accuracy and quality of their data. Their lost productivity translates to a cost of over 200,000 GBP per week by some estimates.²

MDM can help manufacturers reduce the cost of manually reconciling supplier invoice and discount discrepancies. Direct marketers can eliminate the waste and expense of duplicate customer mailings. Billions of dollars can be saved in ERP consolidations that won't be required, because regional databases can finally be reconciled.

Essential Attributes of Successful MDM Solutions

As is always the case when a business technology attracts hype and heat, vendors are scrambling to reposition existing products as MDM solutions. Potential adopters should be wary, and should carefully evaluate prospective solutions for the ability to integrate smoothly into existing environments and complement existing systems and applications.

Other desirable features and characteristics include:

- **Robust transactional capabilities** – MDM solutions must not only create and maintain reference data objects, but also provide robust transactional capabilities that enable it to act as the operational system of record.

- **SOA compatibility** – Data should be created, managed, and accessed through intelligent services capable of bundling data together with all appropriate application logic.
- **An extensible data model** – A critical feature that determines the scalability of an MDM solution is the ability of the data model to support multiple, extensible hierarchies.
- **Role-based, attribute-level security** – All data must be thoroughly secured, with read and write access definable to the attribute level, as well as with role-based permission settings.
- **Attribute-level workflow support** – MDM solutions should provide workflow support for the automation of data management processes as well as full auditability.
- **Open interoperability** – The middleware integration component of any MDM solution should provide open, standards-based communication interfaces, allowing the widest range of interoperability with other systems and applications.
- **Open-ended scalability** – Organizations that require MDM solutions are typically large, with hundreds of internal applications, many thousands of users, and millions of records. The MDM solution must be able to scale to service the entire environment, as well as support customer and partner interaction.

Customer Data Integration (CDI) at a Global Financial Services Company

IBM has helped consolidate customer information for a leading provider of insurance and financial services. As part of its evolution from a traditional insurance company to an integrated financial services provider, the company needed to consolidate customer information that was spread across three different organizations (a retail bank, mutual fund company, and newly acquired property and casualty insurer) and five different lines of business (property and casualty, banking, institutional, brokerage, and mutual funds). In all, customer information from more than 30 separate back office and customer relationship management (CRM) systems needed to be unified.

The solution had to be powerful and scalable enough to support over 100 million customer records, but also flexible enough to easily integrate new acquisitions, products, and future systems. Management decided to implement an enterprise-wide customer-centric solution that would become a unified system of record for all customer data, and to do it in a phased approach that would leverage the company's existing front and back office systems.

To meet these challenges and achieve its business goal, the company chose IBM WebSphere Customer Center. This enterprise customer hub elevates customer processing from front and back office silos to an enterprise customer hub, allowing the company to unify, view, and update customer information across all business lines and systems in real time.

The WebSphere solution has already realized processing efficiencies based on more complete customer information, and has enabled more streamlined processes in the client acquisition area. It has allowed the company to realize incremental return on investment, while gaining the most leverage from customer-centricity by focusing on its largest line of business.

IBM, a Global Leader in MDM

It should surprise no one that IBM has pioneered MDM, and has developed many of the technical standards and best practices that define the field. Its MDM practice brings together all the core components required for a successful enterprise MDM strategy: information integration, content management, business intelligence, data governance, and master data management for industry-specific data objects. Core elements of IBM MDM solutions include:

- **An established methodology for MDM implementation, from requirements definition through deployment and operation.** IBM's proven WebSphere® suite—comprising the WebSphere Customer Center, WebSphere Product Center, and Entity Analytics solutions—is based on insights gained from more than 500 projects worldwide. It's a comprehensive, step-by-step roadmap that covers initial planning and strategy through practical implementation and production deployment.
- **A complete solution stack of integration software products.** The IBM WebSphere suite provides the broadest range of information integration tools for implementing and operating MDM solutions.

Product Information Management (PIM) at Panasonic

Panasonic is a global leader in consumer electronics. The company's European operations date from 1962, and currently employ a workforce of 13,000 in manufacturing, sales research, development, and support functions. About 60% of the company's \$10 billion (U.S.) in annual European sales reflect products manufactured on the continent.

Because product offerings are changing constantly due to technical advances and competition, success requires swift and well-coordinated development, marketing, and distribution. But until recently, those cycles were slowed by manual collection of product specifications, followed by validation, translation, and distribution functions that were typically conducted by e-mail. In order to remain competitive, Panasonic Europe needed a more effective way to create consistent, complete information about its products, and a better way to distribute product information to customers, dealers, and Web sites.

To address this need, Panasonic Europe teamed with IBM Global Services – Application Management Services to implement a solution based on the IBM WebSphere Product Center, a product information management solution that manages the process of creating, enhancing, and distributing product information.

The new solution is designed to manage product information on more than three million SKUs, consolidated from SAP, i2, and other Panasonic applications, and directly entered by product managers. Approval and translation workflows are automated, and only new information is sent out for translation. The company can now simultaneously release new product information to its e-commerce Web sites, print catalog production department, and price change notification process arm.

The WebSphere solution has helped Panasonic reduce the time for creating and maintaining product information by up to 10%, and has reduced data entry errors from 5% to 0.1%. As a result, Panasonic Europe expects to save about \$6.6 million (U.S.) per year, as well as cost reduction to its external partners of roughly 25%.

- **Industry Models and Assets.** IBM offers data and process models that have been jointly developed over the course of many years with global leaders in their respective industries. These models truly jump-start an MDM process by applying process and data best practices from some of IBM's most well-known customers in insurance, banking, telecommunications, and retail, among other industries.
- **A proven track record of implementations.** IBM has an established Global Services MDM practice, with proven implementations in all key industry verticals.

Your Next Step

For more detailed information on MDM and its impact on businesses in your industry, contact IBM for an executive presentation at mdm@ca.ibm.com, or visit IBM at www.ibm.com/software/data/masterdata/ ■

¹The Data Warehousing Institute. *Data Quality and the Bottom Line: Achieving Business Success through a Commitment to High Data Quality*, 2003.

²Computer Business Review Online. *Giving Your Data a Spring Clean*, Madan Sheina, 2006.