IBM `Information Management` software

IBM Multiform Master Data Management: Harnessing the value of enterprise data

Contents

The challenge of master data management

Master data management (MDM) has become a top priority for many organizations as they try to gain control over their most valued and often overlooked asset: their data. Master data—the high-value information such as customer, supplier, partner, product, materials and employees—is critical for running a business. Yet, master data is typically scattered within heterogeneous application silos across the enterprise.

Over the years, companies have attempted to fully harness the value of data through various technologies and methodologies such as enterprise application integration, data integration, data cleansing, data matching, customer relationship management (CRM) and data warehousing. These varied approaches are often described with terms such as single view, integrated view, common customer view, 360-degree view, customer profile, product mastering, customer mastering and system of record.

Although these early efforts often provided short-term or tactical value, they did not provide the long-term benefits to enterprise data management that are required for today's competitive environment. In fact, the end result was often just another silo of data, further complicating the data landscape.

Early attempts at solving the master data problem often involved approaches based on business need, usually addressing one or two specific data domains such as customer or product information. This resulted in the prominent market categories known as customer data integration (CDI) and product

information management (PIM). These categories were introduced primarily because specific industries were experiencing significant data problems, such as managing customer data in financial services and maintaining product data for manufacturing companies.

These categories have been successful within their own context, providing much-needed capabilities in solving business-related issues such as new product introductions and once-and-done processing. However, when assessing the enterprise master data problem in context of the data life cycle—from the creation of data to its access and use across the enterprise ecosystem—these approaches only solve a subset of the total problem. The need for master data management has further accelerated as organizations have rushed to adopt Service Oriented Architecture (SOA) using the latest Web services technology. SOA creates centralized functional business services that demand a clear, enterprise view of data in order to be accurate and effective, further highlighting the need for data management throughout the organization. The reality is that different types of data remain essentially "locked up" in various silos across the enterprise.

Multiple applications create isolated data silos

A typical organization may have dozens of data silos for systems and applications that contain master data. For example, companies often have multiple enterprise-centric systems, which can include core customer account or product applications, enterprise resource planning (ERP) software and other applications that help run the business. If the core

business of the company involves different types of services or multiple categories of products, there is often a one-to-one correlation between the types of products and services and the total number of applications.

As the number of applications increases, so does the complexity, diversity and duplication of master data. Each application accumulates and stores the data that applies to its specific function—and in its specific format. In fact, some ERP applications contain multiple "modules" that create silos of master data specific for the individual module.

Multiple front-end channel management applications that use master data may be duplicated across different geographic locations and lines of business. These channel applications may support critical business needs such as direct and indirect sales, customer service, or customer and reseller activities. Enterprise ecosystems typically include enterprise data warehouses, marketing databases and various other business intelligence applications. Mergers and acquisitions extend the master data challenge, often resulting in redundant instances of applications, adding even more confusion to the data ecosystem.

Lack of data synchronization can affect business operations
Figure 1 depicts a comprehensive but simplified view of the challenges of master data management across various domains of customer, product, supplier, location and account. There are many different types of master data for any organization. For example, most organizations typically identify 6–12 MDM domains across their enterprise data landscape. In this example, Jane the customer purchased a product. The figure shows how Jane's purchase information is dispersed—and how it varies—across the enterprise.
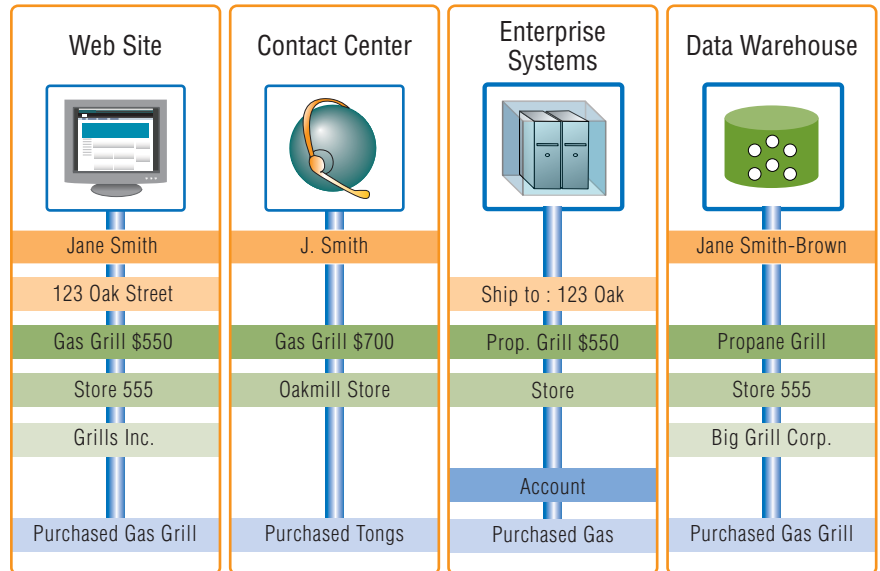
Due to the historical volatility of name changes and issues related to how the system captures name data and corresponding related information, the customer information for Jane is either non-existent or inaccurate.

The product data for the item that Jane purchased also has multiple variations for product name and price, making it difficult to determine the actual cost of the product. It is unclear from the pricing data whether the product was sold for a discount or whether one system is showing the supplier price while another lists the retail price.

Some data silos capture detailed information at the location where the transaction occurred, while others have little or no information about where the transaction took place. In fact, a user cannot align the type of product with the appropriate supplier.

Data silos in Figure 1 lack complete account domain information. Account information is only known in the context of the core enterprise system. Since each silo is self-contained, the enterprise contact center and Web site do not have the ability to access accurate account information in the context of a real-time transaction. The account data, along with other corresponding information, is batch-loaded between the enterprise account system of record and the data warehouse. This type of scenario is repeated for other master data, leading to difficult data synchronization that directly degrades the effectiveness of the business.

Figure 1: Sample data silos across the enterprise illustrate the challenge of master data management

Web Site	Contact Center	Enterprise Systems	Data Warehouse
Jane Smith	J. Smith		Jane Smith-Brown
123 Oak Street		Ship to : 123 Oak	
Gas Grill $550	Gas Grill $700	Prop. Grill $550	Propane Grill
Store 555	Oakmill Store	Store	Store 555
Grills Inc.			Big Grill Corp.
		Account	
Purchased Gas Grill	Purchased Tongs	Purchased Gas	Purchased Gas Grill

Multiple data domains dramatically increase management complexity

The complexity of managing master data may appear to lie within the data itself, because problems with the actual data are quite obvious even to the inexperienced observer. Bad data, however, is only a symptom of a much larger problem.

The root cause of the problem lies outside the context of the bad data; therefore, solutions that only address the incorrect context of data will not resolve the issues. Data management issues will continue to reappear and compound over

time, even after applying standard data quality best practices, such as data standardization and deduplication. The real issue is the management of data, not the data itself.
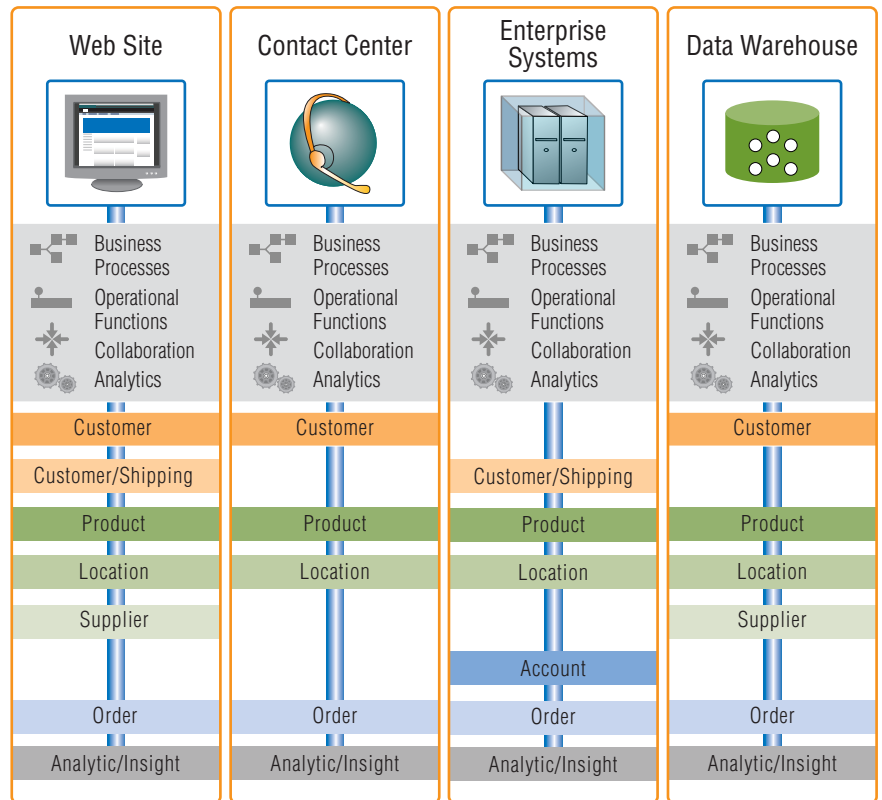
The core of master data management lies within the various systems and applications that instantiate and utilize the data. Each application has its own discrete function and method for creating, accessing and analyzing data—and these methods are all independent of similar data within other applications.

Two key points are important for understanding the root cause of problems with master data:

1. *All systems and applications deal with multiple groupings or* domains *of data. They rarely, if ever, deal with only a single data domain.*
2. *Each system and application has unique roles in working with different master data domains; for example, they can consume data, distribute it or manage the change and update processes for certain data domains.*

Managing data across numerous applications for all data domains is exponentially complex. Every application contains multiple domains of data. Within those domains, each application has its own unique processes that create and manage domain-specific information. In the example illustrated in Figure 2, each application—whether it is the Web site, contact center, data warehouse or any of the various potential core business systems—has different uses for how it consumes, manages and creates customer information:

Figure 2: Managing data across all domains for varied applications becomes exponentially complex

Web Site	Contact Center	Enterprise Systems	Data Warehouse
Business Processes	Business Processes	Business Processes	Business Processes
Operational Functions	Operational Functions	Operational Functions	Operational Functions
Collaboration	Collaboration	Collaboration	Collaboration
Analytics	Analytics	Analytics	Analytics
Customer	Customer		Customer
Customer/Shipping		Customer/Shipping	
Product	Product	Product	Product
Location	Location	Location	Location
Supplier			Supplier
		Account	
Order	Order	Order	Order
Analytic/Insight	Analytic/Insight	Analytic/Insight	Analytic/Insight

- The **Web site** generates customer data as a result of online interactions and online transactions. The Web application adds or updates customer information by calling into an enterprise system to gather data.
- The **data warehouse** uses customer data at an atomic transaction level to execute business intelligence services, which creates additional customer information—as when the business intelligence application assigns a customer segment and creates a risk score.

- *The **enterprise system** has customer information as it relates to a product or service that a customer owns.*
- *The **ERP system** uses customer information as it is used for shipping, service, billing and sales activities, all encompassing different data related to the same customer.*

Multiform MDM centralizes common data functionality

Many organizations have tried to build their own capabilities to manage data. Many have attempted to repurpose their existing ERP, CRM and data warehouse applications to solve the master data conundrum. Although these efforts can potentially address tactical problems, they fall short. Even domain-specific attempts—whether the creation of an enterprise corporate information application or a PIM or CDI hub—provide tangible benefits but do not easily enable other data domains or usage styles.

To address the root cause of master data complexity—how data is created, accessed, managed and analyzed—multiform MDM centralizes the common data functionality dealing with master data. This strategy allows enterprises to identify common functionality for all systems and applications by supporting all the various ways in which those applications may use master data. Multiform MDM moves beyond previous attempts at centralizing control of data by allowing users to fully manage data with multiple domains and multiple styles, that is, types of data usage. Multiform MDM centralizes both the master data and the functionality that manages the master data.

The life cycle of master data affects data management

Three styles—collaborative, operational and analytical—describe how applications use master information. These styles reflect the data life cycle in which data is created, managed and accessed across the enterprise.

Master data may be created through many scenarios, and the style associated with these creation scenarios is collaborative. The collaborative usage style is the dominant style in PIM. For example, an organization wants to manage its business process that relates to the introduction of a new product. It establishes how products are defined and synchronized across the enterprise, and the management of the resulting data is called *Collaborative MDM*.

Another scenario involves transactional business processes within applications that need access to master data via an SOA approach. This type of access to master data provides a view of any entity within a data domain. This operational usage style is dominant in transactional CDI hubs. For example, a front-end channel or application may need access to a single view of a customer during an account opening process. Management of master data within this process is *Operational MDM*.

The final style enables advanced analytics to be performed on master data and provides a staging area for use in business intelligence with data warehouses. It can cross multiple domains and provide unique and valuable insight into master information. These advanced streaming analytics function in the analytical style. This usage style, called *Analytical MDM*, is prominently used for complex analytics on master data domains, such as providing analytical applications with more current and accurate data.
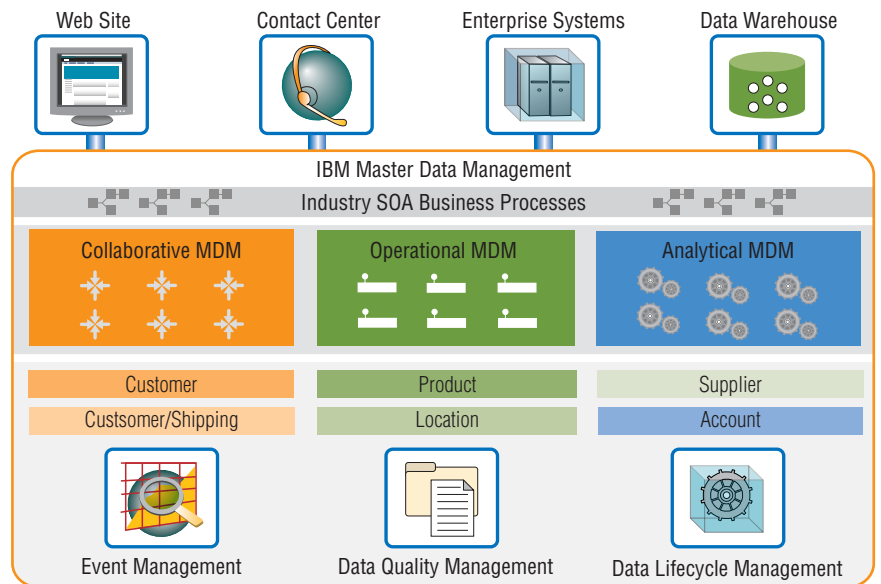
Insight into complex data relationships: The true value of Multiform MDM
The ultimate value of multiform MDM goes far beyond managing domains via the various usage styles. The maximized value comes in understanding the intersection of relationships across domains.

The ability to gain unique insight into complex data relationships—such as a customer purchase of specific products in a particular type of transaction at multiple locations—can prove to be most valuable. In addition, the ability to identify which product was sold, the selling price and the name of the supplier that shipped the product builds on that value.

The granularity of information illustrates the business value of master data management. MDM goes well beyond clean data and an accurate view of an entity within a specified domain. It helps to show how data is used, who uses it, what it was used for and how it relates to other data—across the entire data life cycle.

Figure 3: Multiform MDM defines data usage by styles, which helps identify data relationships across domains

Web Site   Contact Center   Enterprise Systems   Data Warehouse

IBM Master Data Management

Industry SOA Business Processes

Collaborative MDM	Operational MDM	Analytical MDM

Customer	Product	Supplier
Custsomer/Shipping	Location	Account

Event Management   Data Quality Management   Data Lifecycle Management

Delivering information you can trust

IBM

For more information

For more information about Multiform Master Data Management from IBM and IBM Information Platform and Solutions offerings, contact your IBM marketing representative or visit **ibm.com**/software/data/masterdata

TAKE BACK CONTROL WITH Information Management

IMW12024-USEN-00