

# Creating a Single Version of Truth

A white paper on Master Data Management

Author: Ramesh Venkataraman, Head, Business Analytics Practice

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***L&T Infotech***

## **Abstract**

Complex organizational structures have resulted in independent IT systems, each with their own master data. This paper focuses on Master Data Management (MDM) that can be used to enable consistent computing between diverse system architectures and business functions, without impacting source applications. Trends in the manufacturing sector confirm that MDM is emerging as a top priority for CIOs. The different approaches to MDM, as well as ways to maximize the ROI on MDM strategy are discussed in detail.

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## Introduction

Manufacturing organizations with federated business units, which have traditionally grown by mergers and acquisitions, generally end up with independent IT systems. Reference master data is typically stored and managed at application level, creating localized versions in content and structure. Consequently, these enterprises find it difficult to integrate business information across lines of business and suffer from discrepancy in data. This can be substantiated by a survey conducted by the Tower Group that revealed that 50% of enterprises maintain their master data in 11 or more source systems. Further, an equal number rate Master Data Management (MDM) as high priority and over 80% plan on centralizing reference data. MDM ensures semantic consistency across the enterprise and business process lines.

MDM, also known as Reference Data Management, is a sub-discipline of data architecture within Information Technology (IT), which focuses on the management of reference or master data shared by several disparate IT systems and groups. MDM is required to enable consistent computing between diverse system architectures and business functions.

Forrester's report on 'Trends 2007: Master Data Management' points out that the adoption of MDM was initiated by information and knowledge management professionals. The objective was to create solutions that allowed existing applications to work off the same master data in order to reduce data quality and redundancy concerns. However, with the Business and IT users stepping in, this can no longer be just a technology-driven solution. It requires a closer integration to enterprise-level, business-related initiatives such as CRM, supplier collaboration, content management, eCommerce and business intelligence. It also requires a connect to technology-driven initiatives, such as service-oriented architecture (SOA) projects, instance consolidation and so on. This paper discusses the circumstances that have led to the proliferation of master data, the potential benefits of MDM, different degrees of master data management and functionalities required in a MDM solution.

## Emergence of Master Data Management as a Top Priority

The word 'Master Data Management' is not a new buzzword in the manufacturing industry. It has been used over and over under different names ever since the adoption of information technology for business applications, albeit to a limited extent. In the earlier mainframe era, manufacturing organizations implemented business applications that were enhanced incrementally to keep pace with technological improvements. The focus was more on getting the solution to work so as to meet business demands. Little thought was given to the magnitude of master data mismatches due to the limited technology sophistication prevalent at that time. Also, very few could have imagined the emergence of Manufacturing 2.0, Web 2.0, SOA, etc. To substantiate this, let's look at some of the macro trends in manufacturing during the past few years:

### **Trend #1: MDM, a top priority**

Today, many research organizations have identified Master Data Management as a top priority that is in the wish list of every CIO. Many large and medium enterprises end up having several instances of the same master. This could be due to many factors. They may have wanted to implement best-of-breed packages for ERP, CRM, HR, etc. or the organization could have grown through mergers and acquisitions, thereby increasing the number of enterprise applications, each with their own copy. For example, manufacturing organizations may have multiple copies of the customer master, serving the same customer segment.

Few CIOs will admit to the lack of built-in controls and external processes that result in multiple codes representing the same master entity. Progressive enterprises, however, have identified this lacuna and have taken steps to rectify it by cleansing their master data. Many other enterprises are yet to follow.

### **Trend #2: Data consistency needed for better decision-making**

With the advent of Business Intelligence, business users and CIOs alike have realized that churning out vital information is of no use unless the data in the data warehouse is consistent and clean. One of the pre-requisites of data cleanliness is to have clean and consistent master data. Without this, all data might not be loaded on time or it could be split across multiple master codes relating to the same entity.

### **Trend #3: Increasing compliance with regulatory norms**

With the emergence of regulatory, corporate 'non-governance' norms, authorities have been compelled to come up with tighter regulatory systems such as SOX, that demand greater transparency. Thus, the ownership for any inconsistent reporting lies squarely with senior management. No enterprises, today, can get away with inconsistent reporting using dubious data.

### Trend #4: Customer-related trends

In a globally competitive scenario, customers demand more personal attention and higher quality customer service. This trend has compelled manufacturers to create a single view of their customers, irrespective of the divisions or product line servicing them, and identify top clients so that scarce resources can be used to serve them effectively.

When we have multiple versions of a master, it becomes difficult to get a single view of the master, be it with respect to customer, vendor or materials. As shown Exhibit 1, application administrators of different systems and user executives will have to run around to get consolidated information, requiring a longer lead time and higher resources.

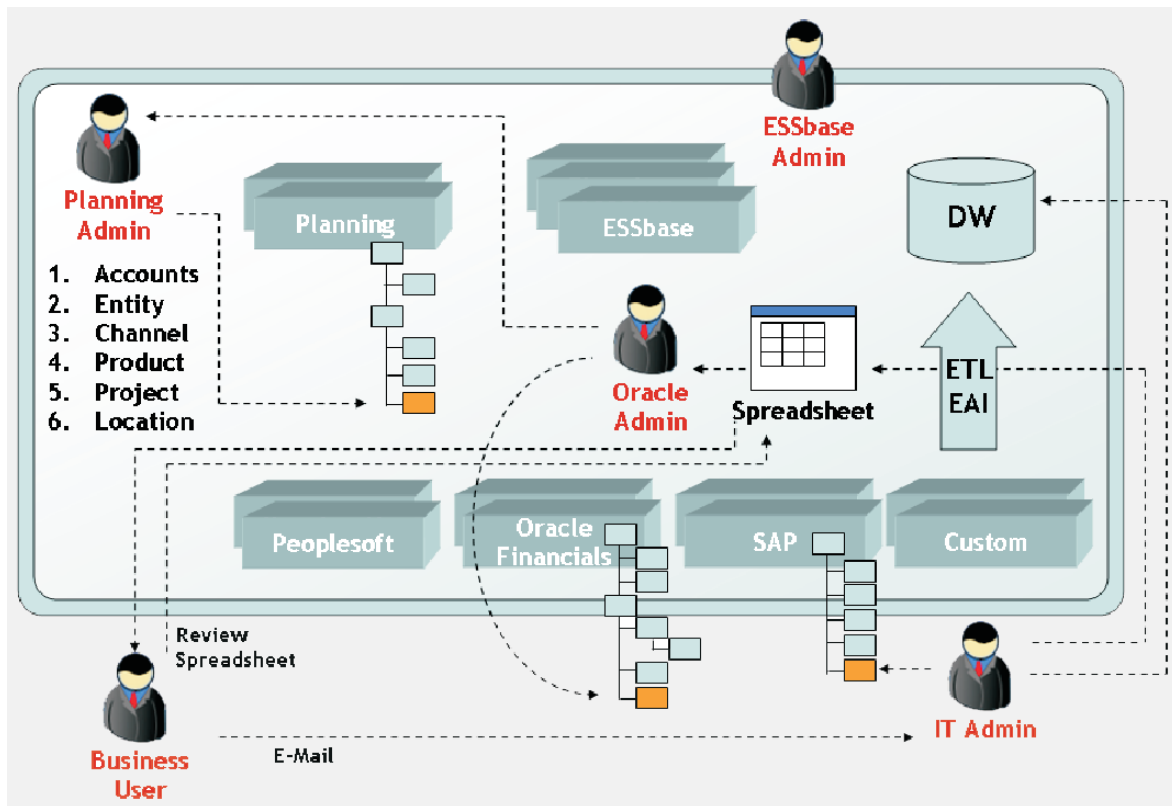


Exhibit 1: Multiple versions of master impede a single view of the customer

## Different Approaches to Increase the RoI on your MDM Strategy

For a manufacturing organization's MDM strategy, the ROI doesn't come into the picture when there is a need for consistent reporting to regulatory bodies and the external world. All of us know it will pay off itself many fold. Most of all, the benefits can be derived without any impact on the existing applications and without any significant investment. We suggest the following approaches to increase your ROI.

### **Approach #1: Customer-centric approach**

An organization can cross-sell its products to customers of other units, if there is an Enterprise Customer Master or Registry. Without the ECM, the business unit sales person will have to make a request to the administrator of each IT system to get the requisite details, which can be time-consuming. In a highly decentralized and independent environment, this can be avoided.

### **Approach #2: Vendor-centric approach**

Using the Enterprise Vendor Master (EVM), the management can consolidate purchases made from a vendor and thereby, avail of better pricing / discounts. The EVM also provides transparency in terms of a vendor's performance rating to improve overall service. By analyzing the registered vendors by material category, vendors can be consolidated resulting in a reduction of vendor management costs.

### **Approach #3: Deploy a centralized master data**

A well-designed centralized master creation interface will ensure that the master entry is created once and transmitted to all the other IT systems, thereby enhancing enterprise productivity and ensuring data consistency. When the central master is integrated with the enterprise data warehouse, transactions across business units can be consolidated to get an enterprise-level view for better management at corporate level.

## Approaches to Master Data Management

There are various degrees of centralization that can be attempted, depending on the investment an organization is willing to make. These levels are not mutually exclusive but incremental. One can start off at a particular level and once the benefits are felt across the enterprise and levels of management, the next level(s) can be attempted.

### Registry approach

The first level is the Central Master Registry approach. Enterprises with multiple applications with local master copies, must complete this level before initiating others.

This approach involves extracting the master attributes from the copies present in the different Systems of Entry (SoE) or Line of Business (LoB) applications, cleansing them, grouping the related records of a single master entity and storing them in the registry. The registry contains one record for each distinct master entity (e.g. customer) pointing to a set of related customer codes in their respective SoE. In effect, the registry acts as a System of Record (SoR). The data warehouse remains separate with master data and the data from the warehouse can be consolidated to get a single version for enterprise performance and reporting. Apart from maintaining only the pointers to master records in different applications, the registry can also be extended to set both the common data (Global Data) of the master in the master entry and application specific (Local Data) in the related records.

The advantage of this approach is that there is no impact on the SoE and no new modules are to be developed (except implementing a simple MDM solution). The registry can be implemented within a short time frame delivering all the benefits of MDM. However, the registry must be maintained at pre-determined intervals, to keep it up-to-date. This will not be difficult, provided the selected MDM solution allows it.

### Master management application

This approach involves creation of a front-end application to capture master data centrally along with mechanisms to incorporate the master data in the SoE through application integration techniques.

The data entered through the common user interface will be maintained in a message queue. The inclusion of the data into target SoE's database can be automated through a daemon process (if majority of the data is expected to be consumed by the application) or through manual selection through a GUI of only the required entries on need-basis. All local data may not be captured in the common interface, particularly if they are required by only one application. These need to be flagged.

This approach, apart from ensuring data consistency, enhances the productivity of the enterprise by creating the data once and consuming multiple systems of entry. This solution is to be implemented once the Central Master Registry has been implemented successfully. It involves development of data integration components within source systems. A standard Master Management application with a common GUI as a built-in feature, can be customized to an enterprise's requirements.

## Master data integration

In this approach, the master copies in the SoE and their respective master maintenance options will be deactivated. The SoE will access a central master through web services or equivalent methods. Only transaction data remain in the SoE and the warehouse.

This approach requires the Master Management Application (discussed in the previous section) acts as the SoR. Due to the significant impact that it has on SoE, as well as the efforts and costs involved, this approach is normally clubbed with enterprise level initiatives such as SOA implementation. This represents a true MDM implementation with no duplication of data and a single version of truth. Many enterprises may not be ready to implement this solution at this point of time, but this is bound to change in due course.

## Technology / tool requirements

Since MDM is viewed as a sub-discipline of data architecture and data warehouse, MDM solutions are generally built around standard ETL tools with graphical user interfaces built using J2EE. From portability considerations, the design philosophy of the solution should keep the dependence on the ETL tool to a minimum, by building business rules in reusable components. These can then be linked to an ETL tool of the client's choice. The Central Master / registry can be built on a standard RDBMS database.

## Conclusion

There is an old adage, 'We cannot wait for the waves to settle down to take a dip in the sea'. Very soon MDM will become indispensable to the medium and large enterprises that deal with large volume of data. Get started now to reap the benefits that we have discussed in this paper.

All masters may not be relevant to every enterprise. For instance, a manufacturing company dealing with a handful of customers may not need a Customer Data Integration solution. However, they may need a Vendor Master Management, if they purchase a large number of items from multiple vendors.

R Wang et. al of Forrester in their article titled 'Trends 2007: Master Data Management' dated February 27, 2007 state that 'Most projects continue to start with one data type and then build out'. This may be a good starting point. Start with one master that is relevant and will have major impact. Then move on to the next, one at a time. Today a variety of MDM solutions are available from different BPM, ERP, SCM vendors and BI service providers at different TCOs, with varying capabilities. While selecting a solution, choose the right, fully-built, end-to-end solution that meets your enterprise requirement. Make sure that these solutions come with a service to create the first clean master since the software is only a small part of the overall implementation

### **About the author**

Ramesh Venkataraman heads the Business Analytics Practice at L&T Infotech Ltd. He holds a Masters degree in Industrial Engineering and a Bachelors degree in Metallurgy. He has over 25 years of IT consulting experience in the Manufacturing and Banking industries and has been actively involved in the development of an MDM solution accelerator at L&T Infotech.

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