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Getting Started with Master Data Management

A White Paper by Deloitte Consulting LLP and Hyperion Solutions

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Getting Started With Master Data Management

In the face of fierce global competition, many companies are striving to hone their information technology (IT) systems to a sharper edge. One way many companies have found to improve business performance management and, thus, operational efficiency, increase revenue, and spur growth is to analyze their enterprise master data and implement a program to standardize, improve, and manage it.

So what is Master Data Management (MDM)? How it can it be used to drive the business, and why is it important for companies to understand and successfully manage their master data? Further, what are the challenges that come with implementing an MDM program, and what are the key process drivers to apply in order to help achieve the desired results from an MDM implementation? We will answer these questions in this paper.

Master Data Management— A Key to Operational Success

Master Data Management is a process that spans all organizational business processes and application systems. It can provide companies with the ability to create, store, maintain, exchange, and synchronize a consistent, accurate, and timely "system of record" for the core master data elements. It also can provide companies with the ability to more efficiently make and manage changes to their master data as the needs of the business change.

Defining Master Data

Master data is a set of core data elements—with their associated hierarchies, attributes, properties, and dimensions—such as customer, product, legal entity, chart of accounts, employee, vendor, market channel, geographic location, etc., that span the enterprise IT systems and drive the business.

Master data is not transaction data. Transaction data is information that is generated and captured by operational systems and describes the activities, or transactions, of the business. For example, a single transaction might be "Ralph Collins sold one 512 Mb thumb drive, part number 110087, from the Portable Mini Drives family, for $70 on May 12, 2005."

Master data is core elements of the business that are applied to multiple transactions and are used to categorize, aggregate, and evaluate the transaction data. Master data is the company's set of "control" data that enables IT systems and users alike to understand the meaning of each piece of data in a transaction. In the above transaction, the "512 MB thumb drive" is an example of master data and represents the product sold.

Other master data elements in the example transaction are "Product Group," "Part Number," and "Salesperson," for which the examples are "Portable Mini Drives family," "110087," and "Ralph Collins," respectively.

Driving the Business with Master Data

What separates successful companies from mediocre or failing companies? In addition to overall factors like strong management, effective strategies, and quality products and services, we believe successful companies have three characteristics:

- They are more flexible and adaptive to change—and they are adept at managing change.

- They make better business decisions, develop effective operational strategies, and accurately forecast future needs and revenue streams.

- They are better able to achieve and sustain compliance with various governmental and legislative mandates such as the Sarbanes-Oxley Act (SOX), the Patriot Act, the Information Security Accountability Act, Basel II, and Solvency II, to name but a few.

But what is the genesis of that difference? What separates the achievers from the contenders? All the characteristics of achievers mentioned above are products of successful business performance management (BPM), which can be facilitated by access to better quality information about the business. Decision-makers' access to this timely, accurate, consistent information can—in turn—be made possible by effective, consistent MDM.

Effective MDM facilitates quality information by establishing a mechanism for shared internal information controls: business units have autonomy over the information they use, but IT has ultimate oversight and control of corporate information. Auditability is another by-product of effective MDM. Effectively standardizing and managing master data, gives a company the ability to track the change history of corporate information, as well as the ability to roll back to a prior state in the event of a systems failure or for comparing prior states with current or proposed future states. Effective MDM also enables enhanced, seamless reporting capabilities, which can result in reduced time needed to implement changes to the business, i.e., improved flexibility and adaptability. Finally, effective master data management facilitates referential integrity across systems that share master data and can, by doing so, support alignment of information and decision making.

This solid foundation provides high achieving companies with what has become the brass ring in information technology lore: a single version of information "truth" across the enterprise. In short, MDM is important because how well companies manage their master data is often largely predictive of both short- and long-term results.

MDM Challenges

When implementing an MDM initiative, many companies focus their efforts on the technical challenges that must be met in order to achieve the desired results. However, the toughest barriers to effective MDM are often the "soft" aspects of IT, i.e., human and environmental.

Creating a Partnership between Business and IT

MDM is most often thought of as a solely a technical, and thus an IT initiative, because implementation involves sophisticated technology. In reality, MDM is a business issue as well. Why? Because it is the business people—the user community—that have the deepest understanding of business operations, events, and vocabulary, as well as the data hierarchies and business rules that represent them.

Given this, it is imperative that—from the outset—the business community and IT form a partnership to lead the MDM initiative. To be sure, IT plays a primary role in implementing the MDM program, but because changes to master data normally originate as a result of business operations or events, the business community should have a large role in identifying and standardizing master data, as well as in facilitating change management within the MDM program.

Managing Change

Another challenge in any MDM implementation is change management. The way many companies do business—and with it, the business data—changes constantly. As a result, the company's master data also constantly changes. Realistically, there will never be "pure" master data—just master data that's accurate for the given current state of the business.

Further, as master data changes, reporting structures and needs unavoidably change. So for information systems to provide a realistic, up-to-date view of the business, master data changes need to be applied to them. The challenge is achieving timely and accurate synchronization across disparate systems.

Each information system uses its own "version" of master data. This has traditionally forced IT departments to use manual and time-consuming processes to keep track of changes, validate them with business users, determine which systems are affected by the changes, and finally update them (manually or through a combination of manual processing and minimally efficient, home-grown applications).

Most often, this process—with its respective cost implications—results in complete environments being halted until synchronization occurs. One typical example of change management problems happens during monthly financial consolidations, which become bottlenecks, as operational reporting, financial reporting, and other processes must wait until systems are synchronized with updated information.

Therefore, the difference in whether an MDM implementation achieves the desired results or doesn't often lies in how well companies propagate and manage the frequent changes that occur in their master data.

Getting Started with an MDM Initiative

Master Data Management is a journey, not a destination. Management and improvement of enterprise master data is an ongoing, often complex, process. However, companies that follow a well-defined, time-tested course for MDM implementation will have a smoother journey and their chances of achieving their efficiency, effectiveness, and flexibility goals will be greatly improved.

There are a few key points that companies must use as process drivers for starting and sustaining an MDM journey. These process drivers will not necessarily mark progress chronologically; instead, they will help determine that progress is being made correctly and that the company's maturity level in understanding the importance of master data is increasing.

These process drivers are:

- Analyzing Performance Improvement Opportunities and Data Pain Points
- Focusing on Process, Not Technology, to Realize Value
- Understanding Enterprise Master Data Flow
- Leading with the Business Community

Analyzing Performance Improvement Opportunities and Data Pain Points

It is imperative to begin the MDM journey by gaining insight into how poor MDM affects business performance. To accomplish this, it is necessary to identify "improvement levers," which are objectives and/or opportunities associated with delivery of shareholder value, and data "pain points" within the company that must be addressed to achieve desired improvements. Pain points are best defined as bottlenecks within the organizational information flow that make it difficult to conduct business operations efficiently.

One example of an improvement lever is an objective to "improve customer interaction efficiency." To enable this improvement and measure its success, a standard definition of customer across all interactions is needed to provide a single view of the customer. Performance measures such as customer profitability and retention can also be measured effectively via standardized definitions across the enterprise.

The value of improvement levers is typically obvious. A single view of the customer could lead to increased productivity via less time spent on manual report reconciliation; improved performance analysis, planning, and forecasting; a better understanding of customer behavior; the ability to leverage improved information to develop better pricing/shipping strategies; and improved ability to sustain compliance with myriad governmental regulations like the SOX act.

In order to realize value from the improvement levers, it's critical to identify performance measurements and dimensions for each improvement lever, so that information can be sorted and aggregated appropriately—i.e. by master data elements such as customer, vendor, product, etc. This also helps steer the process decomposition exercise by focusing on the information assets that are most critical to improving the overall business. It's also important to identify leading practices to activate the improvement levers and assess current organizational capabilities to implement those practices (as well as ways to improve those capabilities). Finally, it's vital to specify expected outcomes, based on available information.

Figure 1 below represents a sample Driving Enterprise Value Map.

With MDM, data pain points involve information assets—in this case, master data elements—that are critical to driving business performance, as well as the processes that use those elements. Data pain is analogous to body pain; it is relatively easy to tell where it hurts. The difficulty lies in accurately defining the problem. For example, a company may be experiencing a problem with reporting, in that different regions or business units receive different numbers when they perform similar analyses. This realization identifies the location of the pain—inconsistent data—but not the source of the pain: the pain point.

A closer look at the matter, however, will reveal a specific source for the problem and will lead to a concrete problem statement. For the example above, further investigation and analysis might lead to the precise problem statement of, "Our Company does not have a consistent definition and hierarchy for data elements such as Customer, Product, and Vendor information across regions, departments, and information systems." This problem statement is the pain point. Other paint points might include unavailable, incomplete, or inaccessible data, and unusable reports produced from enterprise IT systems.

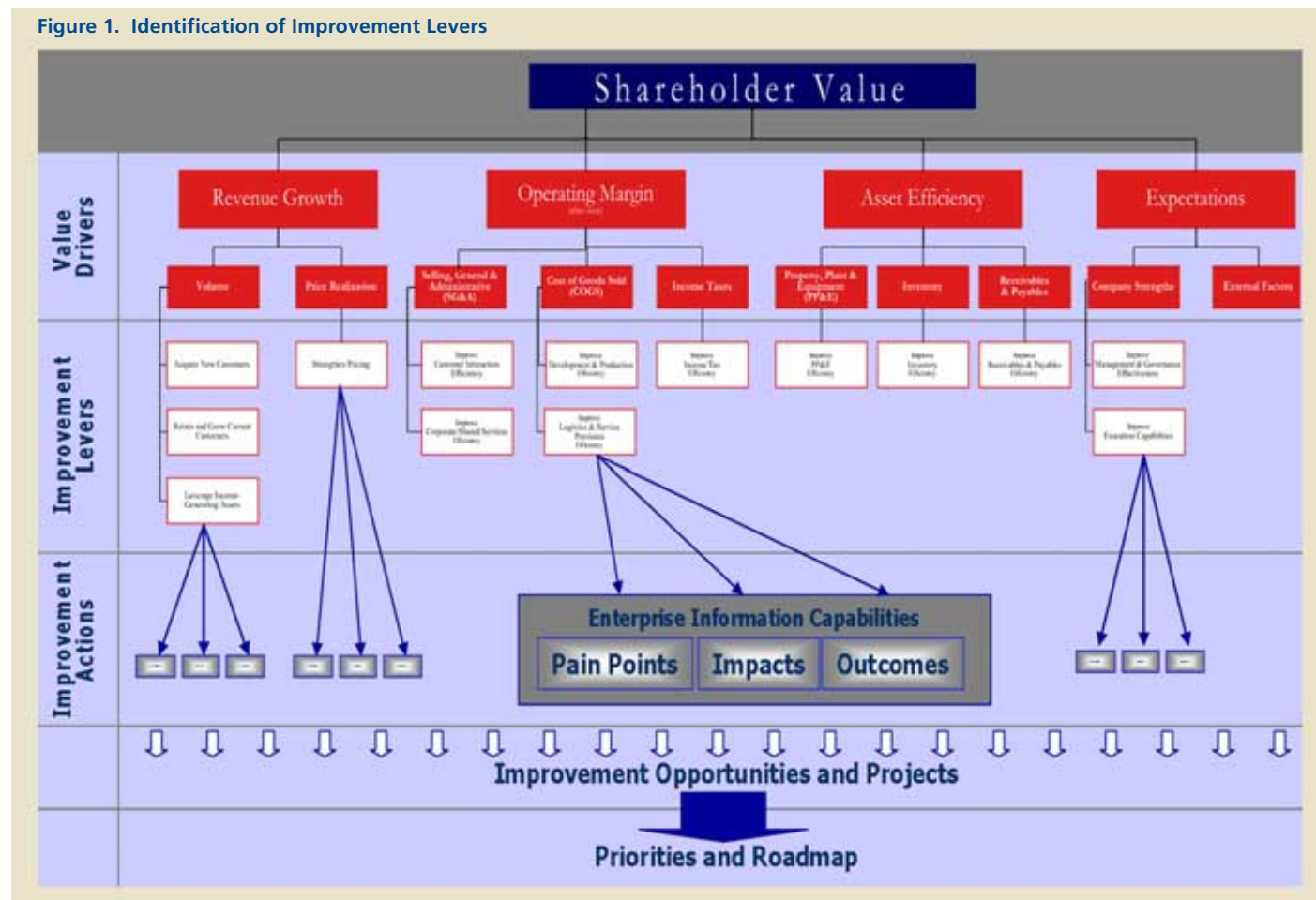Figure 1. Identification of Improvement Levers

Figure 2 below depicts an example of the pain-point mapping process.

After the pain points have been identified, it's critical to develop an understanding of how they affect business performance. For the pain point problem statement above, inconsistent data definitions may result in too many hours spent reconciling data from different reports to come up with a "single version of the truth" about the data. The impact on business performance would be a lack of timely insight, plus decreased productivity due to time spent on manual reconciliation of reports instead of real analysis.

Focusing on Process—not Technology—to Realize Value

There is no doubt that technology plays an important role in any IT initiative. However, before any technological resources can be applied to the problem, companies that are starting on the journey to effective MDM must realize that their business processes hold the key to realizing value from an MDM initiative.

Therefore, once the data pain point analysis is complete, it is critical to develop a process decomposition and perform a value assessment to show the value of addressing identified pain points. The process decomposition should include three or four levels of detail with decomposition and flow diagrams. It should be mapped to enterprise software packages and delivered in common information modeling and database tools such as Microsoft Corporation's Visio® and Access®.
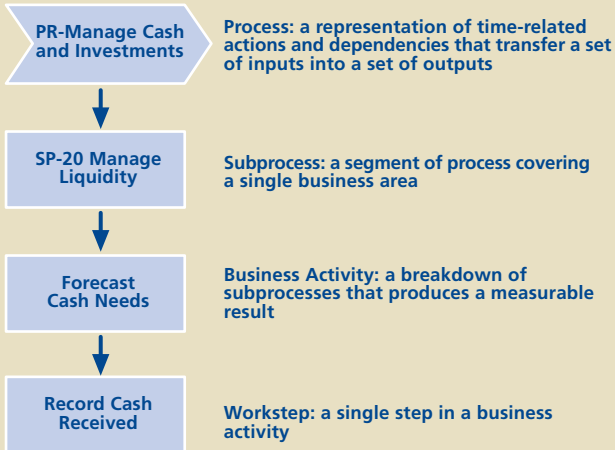
Figure 3 represents a process-decomposition for a single business process.

There are other non-business processes that relate specifically to transactional or operational data and that should be analyzed in an MDM initiative. However, those processes are beyond the scope of this paper. They are:

- Integration
- Migration
- Maintenance
- Quality assurance and control
- Archiving

Figure 3. Typical Process Flow for a Single Process

The essence of an IndustryPrint is a process model, usually constructed in three levels (process-subprocess-activity)

PR-Manage Cash and Investments
Process: a representation of time-related actions and dependencies that transfer a set of inputs into a set of outputs

SP-20 Manage Liquidity
Subprocess: a segment of process covering a single business area

Forecast Cash Needs
Business Activity: a breakdown of subprocesses that produces a measurable result

Record Cash Received
Workstep: a single step in a business activity

The fourth level (workstep) is most commonly used when customizing an IndustryPrint for an individual client

Figure 2. Pain Point Analysis
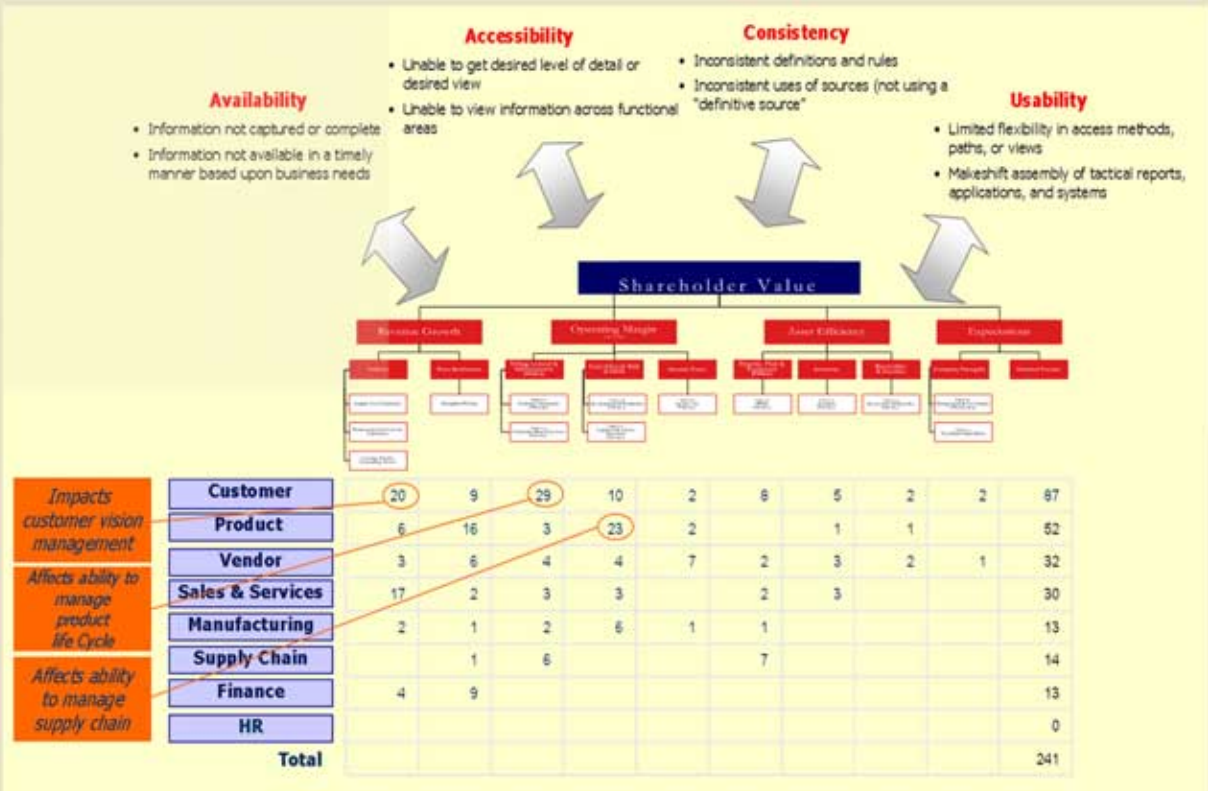
Understanding Enterprise Master Data Flow

Once the value assessment and process decomposition is completed, the next step is to use the model to understand how master data flows throughout the enterprise and identify master data synchronization points. The first step in achieving this is to examine the process decomposition to identify the master data resident in each of the processes.

Figure 4 below represents the identification of master data in selected business processes.

The master data identification effort is essentially a mapping exercise. Figure 3 above represents a listing of processes and sub-processes that might be found in the Manufacturing business function of a company. It is obvious from the graphic display of the processes that master data is resident in all of the business processes that make up the business function, as well as in most of the sub-processes.

For example, the "Sell Products and Services" process uses the master data elements "customer," and "chart of accounts." The "Perform Order Management" process uses the "material" and "customer" master data elements. Other processes use various other master data elements.

It is critically important that, for each process, those master data elements used by that process be identified—and further—that the master data definitions be standardized across the company. When this process is complete, it should paint a very clear picture of the flow of master data throughout the enterprise and of the importance of master data to operational business success.

Leading with the Business Community

The final process driver on the way to MDM maturity is involvement of the business community in the MDM effort. We discussed the "MDM Challenges" of the business community being a partner with IT in the effort to more completely identify and standardize enterprise master data and to effectively manage the corporate MDM program. Meeting this demanding process driver is often the toughest hurdle that companies face when implementing MDM. To meet the challenge, it takes the right combination of people, process, and technology.

Though many people in the business community do have knowledge of corporate IT functionality and systems, their strength lies in their abundant knowledge of how the company does business, how that business changes over time, and what information they need to do their jobs. The key to leveraging participation of the business community in the MDM effort, then, is to give them a time-tested, mature MDM system they can easily understand and use so that they can be actively involved in the effort.

In order to enable the business community to be a full partner in the MDM effort, enabling systems must be intuitive and must provide IT with the capability to securely control and manage the process. These systems must also allow business users to make and propagate changes in master data. Finally, they must also make the inherent technical complexities of MDM transparent to users, so that their primary concern is with the information they need, not how they're going to access it.

Figure 4. Identification of Processes That Use Master Data
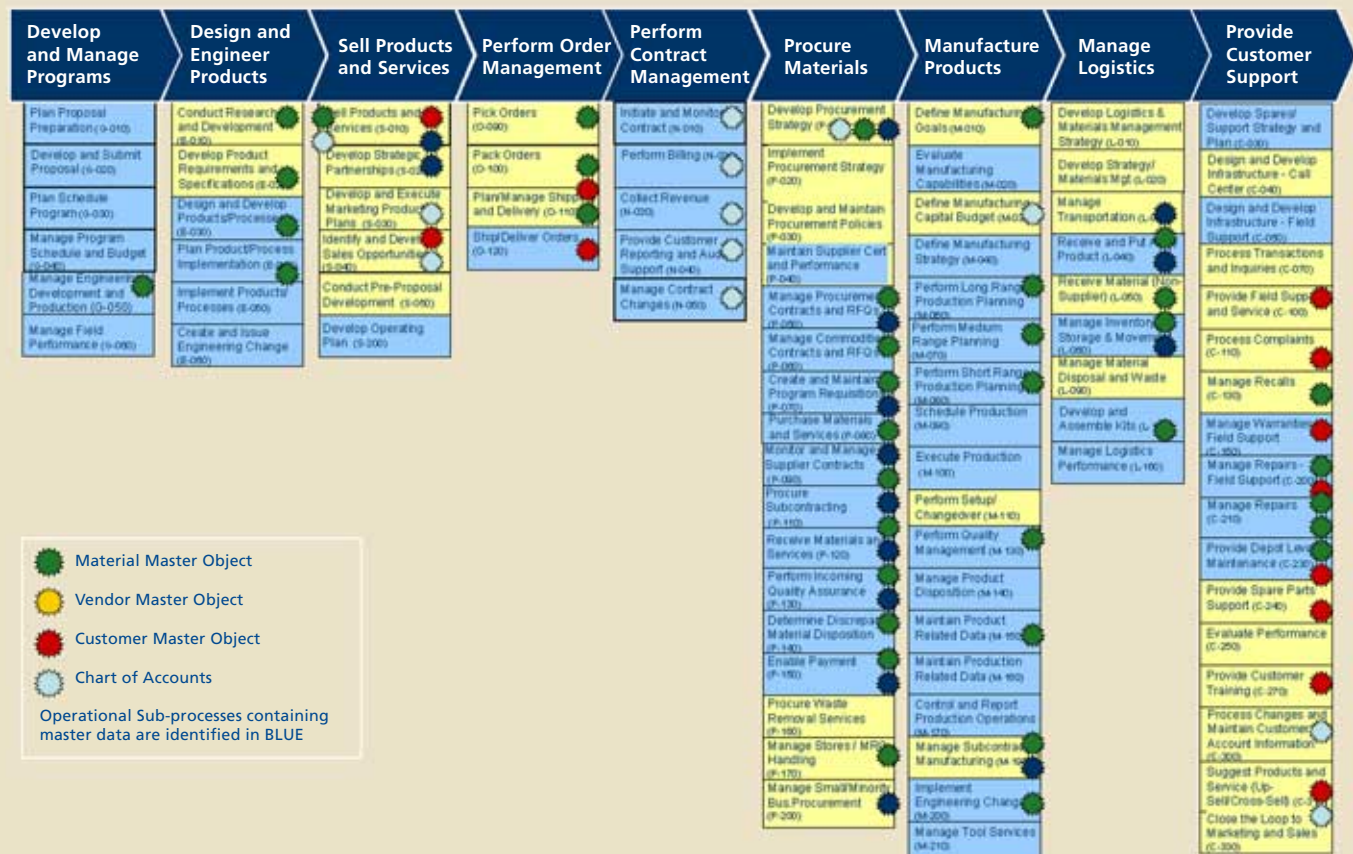
Process and Technology Solutions for MDM Implementation

Deloitte Consulting has teamed with Hyperion Solutions to provide a process oriented, business led, and technologically robust MDM solution.

Process

Deloitte uses its Enterprise Value Map® (EVM) Strategy approach to define the information assets required to support implementation of an MDM initiative. The approach includes:

- Customizing the Enterprise Value Map® (EVM) and using our ValueLink® toolset to:
  - Pinpoint the enterprise informational and analytical needs required to deliver value to the enterprise
  - Deliver a tailored EVM to achieve MDM competency

- Employing a structured approach and the ValueLink toolset to:
  - Identify key improvement themes
  - Identify key performance measures
  - Categorize information by improvement lever and information asset
  - Capture data pain points, business impacts, and expected outcomes
  - Develop a process decomposition to understand process flow
  - Deliver a roadmap of initiatives to achieve MDM competency

The EVM is customized based on our clients' business strategy, processes, and critical information assets. The data pain point analysis is aligned with the business drivers of the organization. We then create three maturity models—information capabilities, data, and information assets—to facilitate a common language and capture business perspectives on current and desired analytical capabilities. We also help clients "socialize" the EVM by facilitating communication of results and helping secure buy-in and acceptance through visual presentation of information.

Technology

Hyperion Solutions provides the MDM technical component to the Deloitte Consulting/Hyperion MDM relationship. Hyperion System 9 Master Data Management Services (Hyperion MDM) is the industry's first master data management solution dedicated to BPM. With its Point 'N Sync¨ thin client interface, Hyperion MDM enables non-technical users to directly manage change in BPM master data. Through a formal, rule-driven workflow process, Hyperion MDM synchronizes BPM master data (such as business dimensions, reporting structures, hierarchies, attributes and business rules) across BPM and BI-specific applications and enterprise systems, including data warehouses, data marts, analytic applications, and transactional systems.

By eliminating the chaos that typically surrounds change management processes, Hyperion MDM enables a more collaborative relationship between business and IT. The technical staff is freed from the mundane work associated with manually managed processes, allowing more time and energy for strategic issues or architectural projects. Business users enjoy the ability to manage their own master data in a visual environment designed to represent master data in a format that business users can easily understand. Sharing and comparing reporting practices across multiple lines of business and corporate organizations is greatly facilitated.

Hyperion MDM provides robust master data lifecycle and versioning capabilities, in conjunction with a powerful business rules engine and audit capabilities for validating and verifying changes in master data, both in real time and after the fact. Its comprehensive import, blend, and export capabilities differentiate Hyperion MDM as not only a central repository for synchronizing BPM master data, but also providing a choice for making changes either at Hyperion MDM or at peripheral systems.
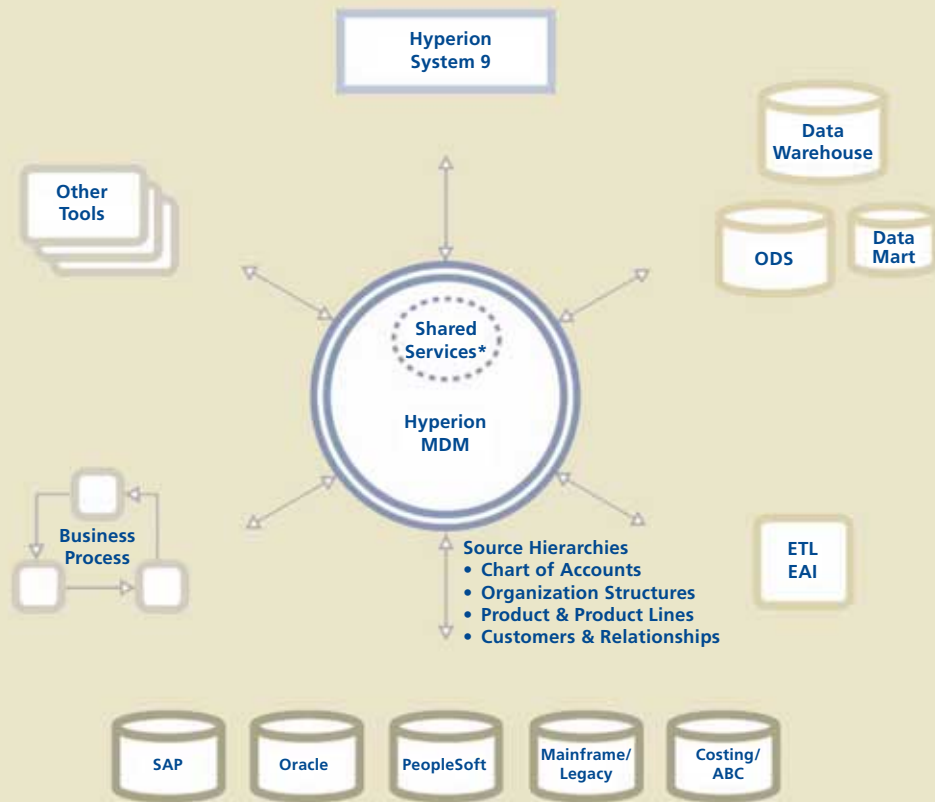
In addition, it includes a comprehensive and fully-documented SOAP and COM+ API for integrating via Web Services with other applications, regardless of data models.

Figure 5 represents Hyperion's conceptual MDM technical architecture

Key Benefits of using Deloitte Consulting's IndustryPrint process modeling methodology and Hyperion MDM include:

- Enhanced Business Performance Management in the organization, as systems that share master data are in alignment, thereby providing consistency of information and facilitating timeliness in decision making.

- Increased value of IT and Business collaboration when more business users get involved in the maintenance of dimensions and hierarchies, reducing costs of manual processing and freeing up IT resources to focus on other productive activities.

- Improved master data change management and communications, as the organization has an enterprise-wide mapping of its business processes and stakeholders, which is accurately represented in the technical architecture and enforced by centralizing, automating,and simplifying complex business rule management.

- Increased ability to manage non-compliance risk, via comprehensive audit controls and accountability processes. This allows organizations to keep historical records with full logging of changes, and the ability to query, report, or roll back to any point in time its BPM master data.

- Enhanced reporting integrity because IT organizations have the ability to manage complex relationships between master data elements, business rules, and peripheral systems' requirements, thereby ensuring information accuracy across enterprise systems.

Figure 5. Hyperion's Conceptual MDM Technical Architecture

Hyperion
System 9

Data
Warehouse

Other
Tools

ODS

Data
Mart

Shared
Services*

Hyperion
MDM

Business
Process

Source Hierarchies
• Chart of Accounts
• Organization Structures
• Product & Product Lines
• Customers & Relationships

ETL
EAI

SAP

Oracle

PeopleSoft

Mainframe/
Legacy

Costing/
ABC

*Hyperion System 9 Shared Services™

Selected Case Studies—
The Look of and Effective MDM

We have provided several case studies below that illustrate the results that organizations that have chosen the Deloitte Consulting/ Hyperion team have achieved when implementing MDM solutions.

International Electronics Manufacturer

A major international electronics manufacturer faced many business issues with their existing data warehousing, business intelligence and master data management environments. Their existing environments were decentralized and the individual data stores were owned and maintained by each strategic business unit. This environment contributed to several problems, including inadequate enterprise data standards; poor data integrity; a vast array of tools, hardware and skilled resources; and little to no sharing of knowledge/tools between strategic business units and geographic regions. Moreover, the environment led to a high-cost, difficult-to-manage decision support environment that did not fulfill existing business intelligence requirements and could not be leveraged for customer and supplier master data management.

Deloitte Consulting was engaged to help this client develop an information architecture and roadmap across strategic business units and geographic regions. The project was broken into three phases: current state assessment, future state architecture and implementation roadmap.

The client received three very important deliverables from Deloitte Consulting. First, Deloitte Consulting helped the client develop an inventory of hardware, software, systems and methodologies that were currently deployed throughout the six strategic business units and three geographic regions. Deloitte Consulting helped the client with future state architecture, organization, and governance recommendations based on industry leading practices and applicable "lessons learned" from Deloitte Consulting's services in support of other data warehousing and business intelligence projects. Lastly, Deloitte Consulting helped the client develop an implementation roadmap identifying the migration steps for each of the strategic business units and geographic regions from their current state to the future state architecture.

The results allowed this manufacturer to become more cost effective, repeatable, auditable and agile when implementing and maintaining future decision support, metadata management and master data management systems.

National Financial Institution

Prior to implementing Hyperion MDM Server, this major financial holding company with assets over $100 billion, struggled with completing monthly hierarchy maintenance to reporting systems — upwards of 20,000 transactions per month, across roughly 25 different hierarchies. Comprehensive validation and verification processes were challenging, because the monthly maintenance schedule was so aggressive and labor-intensive.

"Hyperion MDM Server has worked better than expected and we have yet to fully leverage all of its capabilities," says the institution's senior vice president and manager of management reporting operations and systems. "We chose Hyperion's software to keep our various accounting and financial reporting and analytical systems synchronized, to meet the increasing demand for more rapid implementation of changes allowing us to develop better solutions for complex problems." The company now has an efficient master data change management process that incorporates business users and automates approval and synchronization processes across various systems. This allowed the company to reduce by 50% the resources required for maintenance of its master data and greatly enhance analytical and reporting capabilities. "The amount of time we've saved across numerous departments is remarkable. We're now able to focus our attention on much more value-adding initiatives."

Major European Telecommunications Group

This European telecommunications group with substantial international operations was manually updating changes in organizational structures within multiple systems. This was time consuming, and different systems would often show diffferent information. With Hyperion MDM Server, the company has deployed a self-service, single point of maintenance solution.

"Hyperion MDM Server was chosen after an extensive search in the marketplace for master data management applications," said the company's head of system and process development, group finance.

With Hyperion MDM, the organization can deploy a self-service, single point of maintenance solution, which will greatly improve information quality across the board.

The Hyperion software also enabled the organization to have documentable Sarbanes-Oxley-compliant processes for master data maintenance. It also reduced the amount of time system experts need to spend updating systems with changes in master data.

In addition to reduced master data management costs and streamlined reporting, Hyperion MDM has enabled this company to reap other noteworthy benefits, including:

- Increased productivity by empowering users to speed essential processes by changing data structures at the user level, while reducing reliance upon IT resources

- Reduced security risk through implicit ability to manage data from broad range of external systems using established security guidelines

- Reduced compliance cost and risk with increased compliance confidence through comprehensive audit trails and accurate reporting

About Hyperion Solutions Corporation

Hyperion Solutions Corporation is the global leader in Business Performance Management software. More than 10,000 customers rely on Hyperion software to provide visibility into how their businesses are performing and to help them plan and model to improve that performance. Using Hyperion software, customers collect data, organize and analyze it, then communicate it across the enterprise. Hyperion offers the industry's only Business Performance Management solution that integrates financial management applications with a business intelligence platform into a single system.

Named one of the FORTUNE 100 Best Companies to Work For (2004), Hyperion serves global customers in 45 countries. A network of more than 600 partners provides the company's innovative and specialized solutions and services. Hyperion generated revenues of $703 million for the fiscal year that ended June 30, 2005 and is traded under the Nasdaq symbol HYSL. For more information, please visit www.hyperion.com.

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