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Practical Fundamentals for Master Data Management

How to build an effective master data capability as the cornerstone of an enterprise data management program

WHITE PAPER

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Introduction

Enterprisewide programs are often designed to improve business processes and business decisions through enhanced information sharing – based on a more reliable foundation of data. For this purpose, these initiatives promise significant organizational benefits along a number of dimensions of value, but, as with any business project, they can also carry significant risks and complexity.

Organizations that have successfully deployed programs that span the enterprise are prime candidates for a successful enterprise master data management (MDM) initiative; those lacking this experience are at greater risk for MDM failure. However, since the early tangible value of an MDM strategy comes from **standardized semantics, consolidated metadata**, and most critically, **data quality improvement**, focusing on these fundamental aspects of MDM reduces the risks while providing practical utility to the data user community.

In this paper, we look at the levels of maturity and capability necessary for deploying enterprisewide initiatives, such as comprehensive MDM, and examine why these initiatives stall. In turn, we will consider the types of value derived from MDM and which tangible benefits you can achieve early in the process. Since many of these early benefits concentrate on simplifying and standardizing semantics, managing metadata and improving data quality, this paper suggests that starting with tasks that address those fundamental needs will add value and prepare your organization to take the steps needed to incrementally build the master data capability. In conclusion, we provide some concrete actions that you can take to position those fundamentals as the first step in growing a long-term, business-oriented, enterprise information strategy.

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Considering Master Data Management (MDM) Benefits

New technologies such as master data management are often positioned as "silver bullets" when it comes to addressing long-standing systemic challenges. Every corporate technology of the preceding decade – data warehouses, enterprise resource planning (ERP), customer relationship management (CRM) – arrived with similar levels of fanfare to solve the problem of managing data across the enterprise.

It should not be surprising that the numerous benefits suggested by the hype surrounding MDM might lead to inflated expectations. Yet when the dust has settled, the tools are installed, and the data integration is done, organizations often find that they are still stalled in progressing toward that elusive "360-degree view" of the customer, product or other data element.

Perhaps too much faith is placed in the conventional wisdom surrounding the value of MDM. When reviewing the different white papers, vendor briefs, analyst reports or the many articles on the topic, it is valuable to consider the business drivers for – and purported benefits of – implementing MDM.

In general, the presumptive benefits achieved using MDM techniques can be categorized into three classes:

- Vague statements with no measurable characteristics or performance metrics (such as "becoming a smarter organization").
- Valuable business benefits for which MDM is necessary but not sufficient (such as "reducing merger and acquisition costs").
- Data improvement benefits derived from better data quality and data governance practices.

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They Sound Good, But…

Senior business executives are focused on the organization's strategic objectives and how performance metrics demonstrate business value. In that light, the value of any proposed technology must be coupled with hard metrics that can be used to baseline the current state and show measured improvement.

In the examples above, statements like "enabling people to make decisions more quickly" or "making your organization smarter" both sound desirable. However, neither has discrete measures of quantification, and you might ask whether either has any real business meaning at all. After all, it is unclear whether concepts like "the speed of decision making" or "organizational smartness" contribute to achieving an organization's strategic objectives. Other examples are equally devoid of substance, such as "reducing the count of vendor records" or "breaking down organizational silos." These are more likely to be outcomes of more direct business process improvements focused on revenue generation, reducing costs or decreasing operational risk, but do not add value in and of themselves.

Essentially, while we are presented with a large number of potentially desirable outcomes, not all of these are directly associated with creating value. And without a way to quantify the business value of a purported benefit of a technology, you would find it difficult to use that benefit to justify moving forward with that technology.

Master Data and Real Business Value

Using the existence of a quantifiable metric to measure business value as a filter, we can quickly strike the vaguely defined benefits off our list, allowing us to focus on real business value drivers such as improving customer retention, increasing revenue, simplifying supplier onboarding, reducing risk or lowering costs. These measurable business value drivers are definitely affected by the use of a high-quality, unified view of critical data domains such as customer and product.

In these cases, MDM contributes to achieving the business goal, but it alone does not guarantee the business benefit. Increased visibility into customer data helps staff members evaluate the various customer interaction touch points and analyze process effectiveness. But it is the synergy of high-quality data and good business processes that you can use to exploit information. The combination of visibility into customer information, behavior profiling, predictive analytics, and most importantly, the business processes for operational integration of the above, will enable your organization to forestall attrition, improve customer retention or increase up-selling and cross-selling.

A structurally and semantically consistent view of master data can produce other benefits, including:

- Reduced costs related to mergers and acquisitions.
- Improved product management.
- Simplified procurement processes.
- Improved compliance with privacy legislation.
- Increased employee productivity.
- Refined fraud prevention.
- Reduced overall spending.
- Increased revenue and customer share.
- Improved operational risk management.
- Optimized marketing and sales promotions.
- Reduced supplier onboarding costs.
- Improved supply chain management.

Introducing MDM is just the first undertaking for your organization to gain these benefits; the trick is specifying the concrete methods by which you can achieve them. And the first step is in readying your organization for change.

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Assessing Organizational Readiness for Enterprise Initiatives

While MDM supports all the well-defined business value drivers, installing an MDM tool does not necessarily guarantee results. Prematurely deploying technical platforms in anticipation of the business benefits can only lead to missed expectations, and consequently, the perception of program failure. You can gain true value when key stakeholders understand that the technology is only part of the solution, and the organization needs to realign its processes and retrain its staff to get the best advantage from comprehensive customer and product visibility.

Common barriers to achieving success for MDM at the enterprise level are:

- **Horizontal coordination** – Ensuring effective coordination across numerous lines of business (this is a "people" issue).
- **Coordinated systemic change** – Managing the need for changes to business processes along with master data views (this is a "process" issue).
- **Consistency in meaning** – Simplifying the processes for resolving semantic inconsistency (this is a "knowledge management" issue).
- **Standardized business rules** – Using MDM to manage and enforce business rules, based upon agreed data standards (this is a "technology" issue).

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Your organization can more effectively take advantage of enterprise master data when the senior managers are ready, willing and able to make fundamental holistic changes to "business as usual." This may range from simple process "tweaks" to wholesale changes to key business processes, incentive factors and compensation models. In fact, without understanding the need for these change management imperatives, your organization will probably not fully benefit from a unified view of critical data sets provided by enterprise MDM.

Horizontal Coordination

Most business processes are developed in the context of the day-to-day operational needs. Applications collect data without the staff members considering how other areas of the organization might repurpose and reuse that information. In contrast to the distinct awareness of each function's own data uses, a degree of myopia takes over once the data leaves the functional silo.

People don't recognize issues until they need to analyze errors that have bubbled up to the surface, often when they have led to internal impacts or even spread out to the customers. Requests to fix issues cause alarm, especially when the issue has a business impact such as protection of private data, negative perception of the corporate brand, loss of opportunities or increased costs. The severity of the issues may prompt an increased focus on data issues; this reactivity is a characteristic of limited maturity in taking advantage of data as an enterprise asset.

This means that even with master data repositories, everyone's focus will remain on the silo until better practices for cross-functional data coordination are put into place. The areas of the business will benefit from improved data quality, but improved data exploitation evolves as the organization develops better approaches for soliciting, documenting and internalizing data usage and quality requirements from across the different lines of business.

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Coordinating Systemic Change

We can bundle business initiatives using terms like "customer-centricity" and "brand enhancement" that demand the use of master data. However, scratch the surface and the actual tasks involved with taking advantage of customer-centricity involve both the data and the business processes.

For example, saying that complete customer or product data visibility will lead to better up-selling and cross-selling does not tell your customer-facing staff how to use customer-product data visibility to make more (or larger) sales. Instead, establishing sales policies will direct the sales agent to increase cross-sell revenue by offering a multiple-product discount. A change to the business process will employ customer-product data to help identify opportunities when a customer is eligible for the multiple-product discount, and it can inform the sales agent on approaches to using that master data to increase sales volume.

Changing the data without changing the process may provide you with more accurate, complete and consistent data, but it will not lead you to the promised strategic benefits. You can only achieve the promise of revolutionary business benefits when your organization is prepared to evaluate and potentially reengineer the business processes to put the master data to its best use.

Consistency in Meaning

Years of siloed functions and the corresponding distributed application development create an environment in which the same business terms are used over and over again without there ever being a common understanding of those terms' specific definition. The growing desire for reporting and analysis has driven the integration of data from multiple sources into centralized data warehouses. But the absence of consistent semantics has led to confusion in the reports, with a corresponding decrease in trust in the results followed by an increased effort for reconciling the differences in understanding. Building the unified view of the key data domains as part of a master data management program often exposes these situations.

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Standardized Business Rules

Consistency issues are not limited to business term and data element definitions. If different groups within your organization have similar data needs, they may also share similar sets of business rules. Again, applications developed in virtual vacuums are subject to variation when it comes to defining and implementing business rules. Standardization of business terminology and associated definitions will enable business rule standardization, but until then, your business may be limited in taking advantage of common master data.

Practical Master Data Management

Before crossing these barriers, your organization is less likely to employ master data management to address the key business value drivers. In fact, the desire to deploy the technology first suggests that the key players might not yet be ready to make those serious changes necessary to address their business challenges.

Although your organization might not be ready to take full advantage of MDM, it can still derive value through a better shared understanding of data semantics, defining data standards, standardizing business rules and improving data quality. This is in line with the third type of purported MDM benefits: technical data improvement benefits derived from better data quality and data governance practices.

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Technical Data Improvement

Creating a unified view of master data reduces variability in data and essentially forces the technologists to refine their definitions, document their shared metadata and review how discrepancies in the data influence day-to-day operations. From this perspective, initiating the data quality and data governance aspects of an MDM activity addresses the fundamentals of data sharing and reuse. This accounts for our technical MDM benefits, such as:

- Promoting consistent use of data.
- Increasing reporting accuracy.
- Improving data sharing and usability.
- Standardizing data validation.
- Increasing data completeness and consistency.
- Complementing a services-oriented architecture.

Achieving these practical, data-oriented benefits not only helps you align the data with organizational information requirements while providing knowledge and expertise to make MDM projects repeatable and scalable, it also helps prepare your key stakeholders to take the first steps toward organizational change.

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Reconsidering MDM

To start with the fundamentals effectively means to reconsider the drivers, the value proposition and the plan for MDM. While it is reasonable to anticipate the strategic business benefits, it is critical to recognize that the business processes must first mature along with the underlying data infrastructure. A steady progression of value begins with the data silos and, over time, transitions across the areas of the business, as shown in Figure 1.

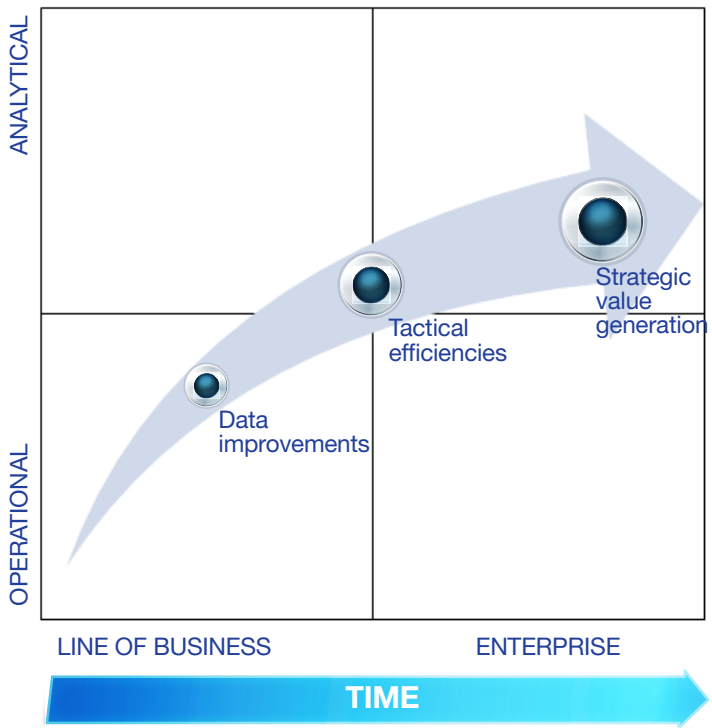

Figure 1: Master data management provides incremental value over time.

Therefore, instead of taking the comprehensive "boil the ocean" enterprise approach to design and implementation, you can take a "fundamentals" approach that focuses on the critical data-oriented improvements such as metadata management, data standards, data quality management and data governance. These aspects are necessary for addressing specific and immediate operational data deficiencies that are also keys to MDM success and will provide concrete benefits, at least through the improvement of the quality of data used within each line of business.

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Purpose-Driven MDM

You cannot overlook the need to identify business targets to be practical beneficiaries for each aspect of the MDM project. Your organization must: 1) determine those business processes that have acute data issues along with measurable business impact; and 2) assess the degree to which a master data task alleviates those immediate issues. Then, you can use each activity to prepare the organization to make the real changes in alignment, communication and business process reengineering. Scoping MDM projects to be business-purpose-driven allows for a "modular" evolution of the MDM capability.

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Start with the Fundamentals

The early tangible value of your MDM strategy comes from our fundamentals: **standardized semantics, consolidated metadata** and, most critically, **data quality improvement**. By focusing on these fundamental aspects of MDM, you will reduce the risks while providing practical utility to the data user community.

Standardize Semantics

Siloed database and application development harbors loosely defined business terms. To demonstrate this, think about the number of different ways the terms "customer" or "product" are used in different areas of your business operations. Aggregating "customer" data from across the enterprise may provide you with a consolidated database, but the different meanings for the term will lead to inconsistency, reconciliation and a general lack of trust in reported results unless the records are known to refer to the same entity.

Standardizing semantics is a process that involves these steps:

1. Identify the business process uses of common business terms.
2. Document a definition of the term within each business context.
3. Determine and document those definitions that are equivalent or consistent (there may be more than one!).
4. Identify and qualify those uses of the business term in which the definition is not consistent.

As an example, the sales department may consider the primary purchasing contact at a company to be a "customer," while the service department may provide service to any "customer" at the company that uses the product. These are actually two different underlying definitions and should be qualified as such. In turn, for any pair of data sets, you can aggregate the records representing a concept into a single set as long as the definitions of each concept are equivalent or consistent.

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Consolidate Enterprise Metadata

Documenting business term definitions collected from across the organization is one small part of a more comprehensive approach to capturing enterprise metadata. Consistency in definition goes beyond the term to include data element naming, types, structure, formatting patterns, table structures and cross-table relations, and how all these artifacts are employed in the different business processes and corresponding applications. Establishing line-of-sight from the business term (as it is used within a defined business policy) throughout the organization simplifies the required data integration processes and reduces effort in incrementally building master data repositories. This also enables rapid impact analysis when underlying policies imply adjustments or wholesale changes to data element usage, definitions or structures.

Improve Data Quality

Because many MDM programs are essentially predicated on the need for more effective sharing of trustworthy information, the aspects of MDM that encompass data quality improvement are likely to deliver business benefits that will extend beyond the funding cycle for an MDM project. These benefits include:

- Processes for data quality assessment.
- Evaluation of suitability of data elements as identifying attributes for matching and linkage.
- Improved triage and prioritization for identified data issues.
- Proactive validation of data.

Balance Business and Technical Benefits

Most business processes will benefit from better data management practices in terms of operational efficiency, reduced complexity and more consistent reporting and analysis. The data management teams can use these tactical efficiencies as a bridge to achieving the strategic business goals.

Ultimately, though, the MDM program needs to address the key business issues attributed to data utilization as reflected through improved measures of key performance indicators. The surest way to lose momentum is to confine the MDM project to IT-only success factors, such as IT consolidation or efficiency. While the technical benefits are useful for establishing visibility, you would have difficulty sustaining the program without creating business value. In other words, when your organization can achieve bottom-line results such as compliance improvement, improved cross-selling, customer retention, and marketing and procurement cost savings, it can realize the long-term strategic value of sustainable master data management.

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Establishing the Fundamentals

Producing early success is a key strategy for realizing the full benefits of MDM. It is therefore incumbent upon the data strategist to determine the path of least resistance for introducing the fundamental concepts and achieving those early successes while planning how the data strategy will align with the necessary changes to the business. Here are three concrete steps you should take on this path:

1. **Readiness evaluation** – Evaluate the degree to which the key stakeholders are prepared to make the necessary changes to best take advantage of master data.
2. **Data quality assessment** – Determine whether there are well-developed processes for assessing data quality within the different business contexts.
3. **Establish business imperatives** – Enumerate and prioritize immediate "low-hanging fruit" data standards, metadata and data quality improvement tasks.

Ready?

Organizational preparedness means that your key stakeholders are willing to identify flawed processes and make the serious changes needed to help those processes work the right way. Gauging this preparedness involves serious organizational introspection. For example, your organization should ask (and satisfactorily answer) the following questions:

- Are we willing to map the end-to-end processes and identify dependencies on a unified view of the data?
- Does each of our business processes have well-defined success metrics?
- Do we have measures for the success metrics, and are they actually measured?
- Are we willing to evaluate and eliminate inefficiencies resulting from duplicated information?
- Do we have established processes for assessing the business impact of poor data management practices?
- Have we engineered incentive and compensation frameworks to reward creation and maintenance of high-quality data?

Set …

We have already stated that many MDM programs are predicated on the need for more effective sharing of trustworthy information. But to gain the benefits of improved data quality, you must know which data sets are flawed, why they are flawed, and the scope and scale of the business impacts of those flaws. A repeatable process for soliciting business impacts and framing them in terms of data quality issues enables a quantifiable assessment of data quality that can be used to calculate ROI for data improvement activities.

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Go!

Lastly, you can offset these calculated returns on investment against the anticipated costs of designing and implementing each of the identified data improvement activities. The difference between the potential return and the costs to improve provides you with an absolute measure of the financial value of each of the improvement opportunities.

You can prioritize these tasks in terms of at least these three dimensions:

1. **The financial value**, which is the absolute financial potential.
2. **The time to value**, which is the time between the start of the task and the time that the benefit is seen.
3. **The strategic value**, which is defined in terms of the degree to which the activity contributes to the long-term data strategy.

You can use these dimensions to prioritize the "low-hanging fruit" that provides quantifiable value while incrementally contributing to meeting strategic objectives. By simplifying and standardizing semantics, focusing on metadata management, and improving data quality, your data management teams can address fundamental needs that will best add value while preparing your organization to build an effective master data capability that is the cornerstone of your enterprise data management program.

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Learn more

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About the Author

David Loshin, President of Knowledge Integrity Inc., is a recognized thought leader and expert consultant in the areas of data quality, master data management and business intelligence. Loshin is a prolific author regarding data management best practices and has written numerous books, white papers and Web seminars on a variety of data management best practices.

His book, *Business Intelligence: The Savvy Manager's Guide* has been hailed as a resource allowing readers to "gain an understanding of business intelligence, business management disciplines, data warehousing and how all of the pieces work together." His book, *Master Data Management*, has been endorsed by data management industry leaders, and his valuable MDM insights can be reviewed at mdmbook.com. Loshin is also the author of the recent book *The Practitioner's Guide to Data Quality Improvement*. He can be reached at loshin@knowledge-integrity.com.

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