

The seven deadly sins of master data management  
How to avoid mistakes that can sink your MDM effort



# Table of contents

- Introduction ..... 3
- Sin #1: Focusing MDM efforts only on the technology** ..... 3
- Sin #2: Failing to implement a data governance and stewardship program** ..... 4
- Sin #3: Failing to take an incremental approach to MDM** ..... 4
- Sin #4: Believing you're ever going to get to complete enterprise consensus on master data** ..... 5
- Sin #5: Believing that one size fits all when it comes to MDM solutions** ..... 6
- Sin #6: Ignoring the significance of data quality and meta data management** ..... 7
- Sin #7: Thinking that you have to implement MDM, or that there is no such thing as "overmastering" data** . 7
- Conclusion ..... 8

## Introduction

You can't escape the interest around master data management these days. The analyst firm IDC predicts that the master data management (MDM) market will reach \$10.4 billion in 2009 with a compound annual growth rate of nearly 14 percent. In a November 2005 Gartner survey of data management practices, companies named MDM as the second biggest driver for their investments in data integration technology.

It's not hard to understand why companies are so focused on MDM. As regulatory compliance and the drive for improved efficiency have caused enterprises to focus more on their data quality and integration problems, MDM has emerged as a good starting point for tackling some of those issues. MDM, when successfully implemented, improves an organization's ability to adjust to rapidly changing business requirements and enables better decision-making. It also boosts operational efficiency by streamlining business processes and improving data quality.

HP defines master data as the controlling set of data values for reference data, which is a category of data that defines the business context of transactions. Reference data becomes master data when business constituents across the organization agree on its definition. Master data might include:

- Customer/account/subscriber
- Product/item/service
- Vendor/account/supplier
- Legal entity/organization
- Geography/territory/region/location

Master data management is, therefore, the collection of practices and technologies to establish a common,

consistent, enterprise-wide view of master data—the core data that describes the people, products, facilities, and other core common definitions of your business.

Master data management was once the province of centralized data administration functions. Master file maintenance was much easier when there was only one instance of the customer, product, organization, and related master files. It is worth noting that a great deal of skill and knowledge related to MDM is distributed throughout the enterprise without an equal distribution of practices, technologies, and stewardship models to tap that value.

With all the great promise of MDM—more intelligent business decisions, more precise reporting, and operational efficiencies—comes a harsh reality. It's easy to draw a neat diagram of a conceptual MDM solution, but it's far harder to implement one successfully when faced with the realities of technical and organizational challenges.

In this white paper we'll look at the top misconceptions, missteps, and oversights that hamper success in MDM and suggest ways for individuals and organizations to avoid the "seven deadly sins" of MDM.

## Sin #1: Focusing MDM efforts only on the technology

It can't be said often enough: managing master data is more about business and people than about technology. It's about creating consensus around a common vocabulary and reconciling old business rules and old organizational ways with new ones. Given the cross-system and cross-business-unit nature of master

data, a comprehensive MDM program should bring together business leaders, application architects, and information architects to create MDM strategies and solutions.

However, too many companies and vendors look at MDM in purely technical terms. MDM certainly comes with its share of technology challenges, but a purely technical approach is bound to fail. The true responsibility for managing master data must be in the business' hands, not in IT's. Many organizations have trouble accepting this principle because IT is assumed to be the "owner" of the organization's data, and the business is reluctant to take too much responsibility for data management issues. But because MDM is quite likely to entail business process change and also requires extensive understanding of business terminology and the context and hierarchy of the data, business constituents must play a key role in any MDM initiative right from the start.

The bottom line is that no organization should begin an MDM effort without business buy-in. In fact, MDM requires more than the traditional business buy-in, more than a business case and funding commitment. It requires a commitment to persistent, coherent participation from business and IT. It also requires a certain amount of "violent agreement" (meaning a consensus that is hard-fought and won). Master data is a localized phenomenon; it originates in the execution of the business and serves that execution at the local level. Respecting the differences that are valid in each locality, whether a line of business or geographic location, is the first order of business. It is quite appropriate that marketing and sales might define and classify "customers" differently.

It is when value must be generated across these localities that agreement is required. No parties to such agreement must relinquish their disparate definitions and uses for their localized master data. Rather, they must agree to share definitions for shared usage applications of master data. When sales and marketing are required to report on the size of their customer base, and that report must be unified, the time has come for shared master data definitions and sometimes violent agreement, but only at the shared level of master data values.

## Sin #2: Failing to implement a data governance and stewardship program

MDM is complicated by the way that master data spans application and business unit boundaries. It may not be realistic to expect that all of the various IT and business units will ever agree to completely trade in

autonomy for centralized master data management. Often there are legitimate regulatory and business reasons for maintaining local variation. And as we'll explore later in the paper, master data is in a state of constant evolution with different levels of adoption and implementation across the organization. What organizations need to manage this complexity is a sensible plan for enterprise standardization (where possible), local variation (where necessary), and a flexible system for managing enterprise data and mapping sensible variation. This is where data governance and stewardship come in.

While data governance and stewardship programs should encompass data domains outside of MDM, they play a key role in ensuring MDM success. And in turn, MDM provides tools for data governance and stewardship organizations to exert control over the quality of information assets. A full discussion of data governance is outside the scope of this paper, but there are a few key points to note. One of the most important success factors in data governance is the makeup of the governance organization or council. Data governance organizations must include members of the business community who have enough influence and dedication to put some muscle behind a data quality program. The responsibilities of the data governance organization should include data quality policies, standards, procedures, and ongoing oversight of quality functions.

Let's focus on data stewards for a moment. Data stewards should fall under the oversight of the general data governance organization or council. As we discussed above, the business needs to own the master data, and therefore, data stewards should come from the business. In terms of MDM, data steward responsibilities might include managing business requirements for master data, managing the quality of master data, ensuring proper data use, and managing additions/extensions to master data. It's important to give data stewards tools that enable them to see the business rules surrounding master data so that they will be empowered to validate and maintain the rules.

## Sin #3: Failing to take an incremental approach to MDM

In years gone by we have encountered corporations pursuing enterprise-wide initiatives such as an enterprise data model or an enterprise meta data repository. When of a significant scale, these initiatives have rarely succeeded when attempted as a monolithic effort.

Master data is no different; an entire enterprise's reference data cannot be brought into consensus

simultaneously. Treating MDM as a single initiative, at the end of which all of the organization's reference data conforms to a common standard and is master data, is highly unrealistic. An MDM project of this type would cost many millions and take several years to complete. In the meantime, the business would lose interest and the project would most likely be cancelled with funding dried up long before completion.

Therefore, it's imperative to implement master data projects incrementally. Each increment, upon completion, must deliver real benefit to the business. That benefit creates momentum, which generates both interest in the next incremental extension of MDM and also the patience to see it through. Although it's good to build a broad vision of MDM for the organization, pilot projects and incremental execution are the keys to success.

Recall our earlier discussion of the history of master data management. A great deal of MDM skill and knowledge exists throughout the enterprise, but what doesn't exist is an equal level of practice, technology, and governance or stewardship. Often the standing models for these things don't fully support the business requirements for MDM. Consider the incremental evolution of MDM within your organization as the generation of increasingly mature levels of capability. Raise MDM capability to the level of recognition and measurement and you are more likely to attract and retain the stewards, sponsors, and users needed to deliver the business value of MDM.

## Sin #4: Believing you're ever going to get to complete enterprise consensus on master data

As we've just outlined, an enterprise-wide, "big bang" MDM initiative is bound to fail. Achieving consensus on even one data subject area across all business units in a large organization at the same time is impossible. Therefore, it's important to manage the scope of your initial MDM projects and work with only a manageable number of business units or groups at one time (the definition of what's "manageable" will vary from organization to organization). However, this approach requires living with master data in a constant state of evolution, and accepting the fact that you will never achieve a point in time at which all business units in your organization are in agreement with and have completely implemented master data for all key subject areas. There's nothing wrong with holding to a vision of enterprise consensus, but you must architect a solution that lets you make incremental progress and effectively manage change.

Let's illustrate the complexity involved in achieving master data consensus with an example. Suppose a

handful of business units within your organization agree to work together to drive some reference data subject area to consensus among themselves. After they achieve some initial consensus, other business units might see value in their efforts and decide to join in the process. Or, if upper management sees the value in your MDM project, it might mandate other business units to join in. This greater "scope of consensus" is an excellent development—you've demonstrated the value of MDM and have gotten some level of corporate buy-in. However, as the new business units join the process, the master data might need to change to accommodate them. It's unrealistic to think that the business units that come later to the process will simply accept in totality the master data that was defined by the original group.

Beyond just achieving consensus on the definition of master data for a subject area, there is the issue of the business units actually implementing the master data in their systems. One business unit might be more highly motivated than the others to have its systems comply with the master data. Others might lag behind in their implementations. At any given point in time, business units will inevitably have different levels of master data implementation within their systems.

This results in a complex picture of the progress that reference data takes to becoming master data. First of all, it is not realistic to wait for all business units to agree incrementally on master data within one subject area before starting the next. It may well be the case that some business units are driving to consensus on one subject area (product, for example) while others are driving to consensus on another (customer). Then within each of these efforts, there will be some business units within the scope of consensus and others not. And of those within the scope of consensus, some have implemented to that consensus view, and others have not. We also must acknowledge that changes in the business environment—new products or services, mergers and acquisitions, regulatory requirements, and so on—will often require changes in an organization's master data. And as we noted above in our discussion of data governance and stewardship, there are sometimes legitimate business reasons for maintaining local variations in master data.

What does this complexity mean for your enterprise vision for master data? In short, multiple views of reference data must be able to coexist within your organization. First of all, there must be a place for the consensus definition to live, where it can be managed and implemented. It also must be possible for master data implementations to coexist with reference data that has not yet achieved master data status.

## Sin #5: Believing that one size fits all when it comes to MDM solutions

With demand for MDM solutions growing rapidly, many vendors from a number of different software markets are entering the MDM fray hoping to capture a share of the market. This fragmented landscape can make it hard for organizations to evaluate which MDM vendor is right for them. Vendor hype can be hard to get past, but no matter what they say, there is no single MDM solution on the market that is right for all companies or that can solve all types of MDM challenges.

So how can you select the right MDM solution? The choice of an MDM solution will take into account many factors, but at the most basic level, we can boil it down to three decision points: Will you be using the master data for analytical or transactional purposes (or both)? Will you be using a mapping approach or a “mastering” approach? And does the solution provide robust change management capabilities?

Let’s look into these decision points in more detail and the unique challenges entailed by each choice.

### **Analytical vs. operational uses of master data**

When using master data for analytical or reporting purposes, the primary challenge you will face is managing the history of master data change over time. Since data warehouses manage history, it is usually insufficient to maintain only the current state of master data, because doing so may lose the historical context of historical transactions. However, it is very difficult to capture all changes to data and relationships over time in a data warehouse and still maintain a scalable, high-performance system. You will have to make compromises in the data model, data architecture, and in all supporting processes.

Operational uses of master data might also include some historical information, but not as much as would be in an analytical system. Operational MDM also faces time-related challenges, but is more concerned with time windows than time horizons. For example, “real-time” end-of-day reconciliation for master data will require a solution that can deliver to an aggressive time horizon. Operational MDM solutions will also need to be suited to handling lots of requests and updates and include a synchronization-type component, especially if you have multiple operational systems involved in distributed transactions. Another consideration for operational MDM is how the solution will enable current or future service-oriented architecture (SOA) initiatives in your organization.

### **Mapping vs. mastering**

First, let’s talk about what we mean by mapping vs.

mastering. A mapping approach to MDM involves synchronizing master data to a model but not implementing it upstream in source systems. A mastering approach, on the other hand, does involve actually changing source systems to include master data. Mastering is more difficult to do, but is often the better choice for certain classes of data.

Organizational factors will determine which approach you take. For example, in some organizations, business units are willing to map their product hierarchies to a master data model, but do not necessarily want to change their systems to use the new master. In this case, mapping is the best approach. Other organizations may believe it’s not enough to implement master data through mapping for reporting purposes and actually want to implement it upstream into their source systems. These types of organizations are better suited for the mastering approach.

A mapping approach introduces particular challenges that should be addressed in an MDM solution. The biggest challenge involves synchronizing data from each source system. For example, it’s quite likely that you’ll have some type of situation where system A is mapped to the master, but systems B and C aren’t. How do you deal with this time period in which some systems are compliant with the master and others aren’t? This is where an MDM solution should be able to help you cope with varying adoption rates across business units and systems and implement change management.

### **Robust change management capabilities**

Legitimate, local deviation from a master definition (see Sin #1), differing adoption rates (see Sin #4), and roll forward/backward requirements all demand robust change management capabilities in an MDM solution. Furthermore, change management techniques within a mapping approach differ from those used in a mastering approach. The master data change management topic is complex and involved in its own right. For our purposes here, suffice it to say that an MDM solution must support independent change activation. It must support independence between master data adoption and master data publishing. For example, if a source application chooses to modify how its reference data maps to master data, it must be possible to deploy those changes without affecting any other source applications nor affecting what master data is published. On the other hand, it must be possible for published master data to change without forcing source applications to change simultaneously. In large enterprise solutions, one must avoid cascading change at all cost.

Although it’s beyond the scope of this paper to discuss which solutions currently on the market fit each

scenario, we can offer a few general suggestions. First, it's helpful just to be aware of the decision points mentioned above when in discussions with any MDM vendor. Second, it's often helpful to look at the heritage of an MDM vendor. Has it come out of the ETL space, or the application integration space, or has its product been developed specifically for MDM? Looking at a vendor's evolution can help you understand its likely strengths and weaknesses in terms of dealing with analytical vs. operational uses and mapping vs. mastering approaches.

Finally, any discussion of choosing the right MDM solution would be incomplete without a mention of the various permutations of MDM solutions that have come about as the result of ERP, CRM, customer data integration (CDI), and other initiatives. The initiative-based use cases that created so many initial MDM projects artificially constrained them out of existence. Ongoing MDM governance and improvements in capability require an evergreen approach to identifying and addressing business problems that MDM can effectively address. As MDM capabilities mature, so does the scale of business value MDM generates across the enterprise. Don't let use-case initiatives like CDI projects or ERP adoption own MDM as a subset of their limited life cycles. Realize ongoing value by chartering your MDM approach as a critical capability shared by business and technology leadership across the enterprise. After all, that was the model used to manage master data when it emerged as a distinct data pattern three decades ago.

## Sin #6: Ignoring the significance of data quality and meta data management

Data quality and meta data management go hand-in-hand with an MDM implementation. Just as for other types of data, you ignore data quality and meta data issues for master data at your own peril. In fact, master data requires higher overall data quality standards, since it is the lens through which transactional details are focused for specific business questions and challenges. And, meta data management is important for empowering the data stewards to maintain master data themselves, as described above.

Master data quality can be defined as the relative comparability (accuracy, precision), consistency (structure, timeliness, granularity), and confidence (fitness for use, reliability) business users ascribe to the master data record set and management system at any given point in time. The same techniques that ensure data quality for other types of data can be applied to master data: validation; audit, balance, and control;

quality tracking; and so on. However, the stakes are even higher for master data because quality problems in master data are likely to cascade to other systems. Therefore, you need to have a rigorous certification, versioning, and deployment process to ensure master data quality. The most important thing to remember is that data quality is an ongoing program, not a one-time event. It's closely tied to data governance and stewardship as discussed above—you can't improve data quality in any meaningful way without an organization to provide guidance and enforce standards and policies.

Meta data management is also critical to the success of an MDM effort because it enables such functions as impact analysis and data lineage. As discussed above, master data evolves and changes over time within an organization, and meta data is the key to tracking and managing those changes. It's also closely tied to giving data stewards the tools they need to manage master data on their own. Meta data enables the stewards to see the business rules, hierarchies, definitions, and so on for the master data they are responsible for maintaining and validating.

## Sin #7: Thinking that you have to implement MDM, or that there is no such thing as "overmastering" data

Vendor hype and media coverage can make it seem like every organization should be tackling MDM. While the potential benefits of MDM are great, not every organization is ready to embark on an MDM initiative. As we stated above, any MDM effort must begin with the identification of a business problem within the organization that can be solved through master data. If you have difficulty identifying specific business challenges that could be solved by MDM, or you can't get business buy-in, don't embark on an MDM effort. Don't make MDM a technology in search of a business problem. It's better to tackle other data management issues first than to spin your wheels on an MDM program that has a high probability of failure.

If you've already embarked on an MDM initiative, you should also recognize that it is possible to "overmaster" data. Just because MDM is good thing doesn't mean mastering data to the maximum level is always best. Avoid trying to create master definitions where there is not common usage. Master data can and should be able to evolve with the organization's needs, but when overmastering happens, master data can become truly unwieldy. Data must be fit for its intended use. If master data definitions are created for everything, and some of the definitions are applicable

to only one function or unit, master data can become an impediment to efficiency and decision-making rather than an enabler of it.

## Conclusion

After looking at all of the challenges involved in MDM, we can easily add an eighth sin to the list: believing that implementing MDM is easy. However, there is a path to success that we have outlined in this paper. Begin by identifying a business problem that can be solved by MDM and getting commitment from the

business. Seek to evolve your organization's capabilities in data governance, stewardship, and quality improvement. Understand the MDM solutions available on the market, including their ability to help you manage complexity and handle the type of master data you're dealing with. And always keep a focus on the organizational element of MDM: building consensus, managing change, and solidifying commitment to managing data as an asset. These key steps can help your organization reap the benefits of MDM.

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