

# A Real Multidomain MDM Solution or a Wannabe?

## Eight Aspects to Consider When Evaluating MDM Technology with Data Governance Capabilities

Dan Power, Hub Solution Designs

### Executive Summary

Master data management (MDM) initiatives are challenging at best but selecting the wrong MDM technology is a difficult mistake from which to recover and can make it impossible to achieve the expected return on investment from your MDM program.

Companies implementing MDM with rigid, fixed data models instead of a flexible, model-driven approach, ultimately find their MDM solution worse than the problem it was intended to solve. They end up with multiple MDM hub technologies that don't integrate with one another and create silos of master data, perpetuating the original data inaccuracies they were trying to fix. And more importantly, they either spend significant time and money modifying the technology to fit the business or trying to change the business to fit the software.

In fact, several well-known companies scrapped their first MDM initiatives entirely, went back to the drawing board, and selected a completely new MDM technology. They discovered too late that their first choice didn't truly handle multiple data domains, wasn't flexible enough to support their business, and couldn't evolve as their requirements changed. Their initial technology selection lacked sufficient scalability, offered limited data governance, wasn't robust enough from an integration perspective, or didn't have enough built-in data quality and matching capabilities.

A flexible technology that models any domain of data and any business situation can prevent you from having to admit failure after spending millions of dollars and months of effort in a very visible corporate setting.

According to a recent Gartner report: "Approximately 50% of all new programs fail to meet their originally stated business objectives. Developing a business case is not an administrative speed bump on the way to implementing a project. It is a value-added process designed to increase the level of success for all those involved in the project."<sup>1</sup>

So spend the time up front to document your short and longer-term business requirements, then conduct a thorough software evaluation and selection process (including a strong business case). More than anything else, this will help you achieve a successful MDM implementation.

Keep reading to learn more about the eight critical aspects you should consider as you evaluate the various master data management solutions on the market.

Sponsored by  **Orchestra**  
NETWORKS

<sup>1</sup> Gartner, Inc., Michael Smith, "How to Measure the Benefits of and Build the Business Case for MDM Initiatives" (April 2010)

## Multidomain MDM: Flexible and Model-driven

Implementing master data management technology can be complex, and nothing is more critical to a successful initiative than the underlying data model of the MDM hub. An off-the-shelf hub with a rigid data model inevitably presents challenges which either force the business to change to fit the technology, or spend a lot of money customizing the technology to fit the business.

MDM can be applied across multiple domains of data – customers, products, employees, suppliers, locations, assets, and others. Your vertical industry will drive the capabilities and functionality required by your business. Whether you intend to use MDM for operational or analytical purposes changes the picture as well, and different MDM technologies lend themselves to different implementation styles. Add in the degree of business involvement needed for a successful MDM implementation, and you can wind up with a very challenging project.

Unless by sheer coincidence, your business is a good fit with the data model embedded in hubs available from today's MDM technology vendors, you're going to run into this issue to some extent. Most commercially available MDM hubs are still either customer- or product-centric.

In its report "Hype Cycle for Master Data Management, 2009", Gartner first defined multidomain MDM, saying "Multidomain master data management (MDM) refers to integrated technology solutions that enable organizations to ensure the uniformity, accuracy, stewardship, semantic consistency and accountability of the enterprise's official, shared master data assets, enabling organizations to eliminate endless debates about 'whose data is right,' and ensure that different IT systems and functional or product line groups within the organization are sharing the same master data."<sup>2</sup>

In response to this report, over the last year MDM vendors have launched "multidomain" hubs which typically are their existing customer- or product-centric hubs that have been extended to handle additional data types. While there has been some progress towards true out-of-the-box multidomain hubs that don't favor either customer or product domains, most vendors still have a lot of work to do in getting their technology to catch up to their marketing materials.

A proven approach to achieving MDM success is to model the business using a modern data modeling tool in an iterative fashion. This gives you the ability to capture the way you do business in your organization and your industry, as opposed to starting from a customer- or product-centric MDM hub. By using a flexible, model-driven approach, your MDM hub will evolve into a complete representation of your main master data objects such as customer, product, employee, supplier, etc.

At its core, one key view of the business is the data view. Your team can capture the data view of your business in the data model for your MDM hub without going through a costly exercise of having to modify the data model of an off-the-shelf MDM hub. The business then has the ability to model its "real world" and to capture how it does business right the first time, without having to add tables and columns to someone else's (i.e., the MDM vendor's) view of the world.

Strong data modeling skills are critical when trying to achieve a rapid implementation, because "what you model is what you get". It is good practice to start small with a simple prototype. This allows iterative capture of requirements in the data model until business owners and users reach a "sign-off" point where they are ready to go live and take over the maintenance of the application and data model.

*"A proven approach to achieving MDM success is to model the business using a modern data modeling tool in an iterative fashion."*

<sup>2</sup> Gartner, Inc., Andrew White and others, "Hype Cycle for Master Data Management, 2009" (July 2009)

This is also an important step in creating a flexible governance organization with the right mix between centralized and distributed data stewardship, since your resulting data model can incorporate global business standards as well as regional and localized variations.

And by relying on a flexible MDM hub rather than on specialized MDM hubs that handle individual domains like customer and product, you can avoid having multiple MDM technologies. This model-driven approach means that one hub truly can manage multiple domains, so you won't need a customer MDM hub, a separate product MDM hub, and a third hub to handle corporate reference data.

## Proactive Data Governance is Key

In previous white papers, we've talked about proactive data governance being characterized by business owners "owning" the master data, with accountability for its accuracy, completeness, timeliness and consistency, resulting in increased levels of trust in master data across the enterprise.

With the technology changes over the past year or so, our vision of proactive data governance has also evolved. We now see it as "providing business users with active control of their shared data, across different lines of business and IT systems." Data governance capabilities are a critical element. Consider these eight key aspects as you make your MDM technology decisions.

### 1 Is there Flexible, Semantic Data Modeling that can Handle the Complexity of Your Business?

As discussed above, this is where it all starts – where you begin defining the underlying data models for master data and shared reference data. It's critical to be able to start with a simple, prototype data model and expand from there, importing existing models (where available) from elsewhere in the enterprise.

But data "enriched" models grow and become quite complex in order to both accurately represent the data view of today's large global enterprises, and also to handle embedded business rules that maintain data integrity. The MDM platform should allow a business "power user" to manage this, so the business can handle most of the development and maintenance of the data model, independently of IT.

Other important characteristics include the ability to support multiple languages, interact directly with the data via web services, and the flexibility to change the data model as the business changes.

When evaluating an MDM solution, take an in-depth look at the underlying data modeling technology. Adding attributes is not sufficient to achieve a true model-driven approach. The solution has to provide a semantic view of the master data. If your MDM hub relies only on a relational schema stored in a database, you could end up designing physical models that are very far from what the business users need; this is typically what happens with "ex-Customer Data Integration (CDI)" solutions. Semantic modeling with business rules eliminates the constraints of physical modeling, thereby helping you achieve the ideal of "what you model is what you get".

### 2 Does the MDM Solution offer a Web-Based, Collaborative, Intuitive User Interface?

Many MDM hubs don't encourage business users to interact with the hub at all – this access seems to be reserved exclusively for the data stewards. The average business user enters new records in a customer relationship management (CRM) or enterprise resource planning (ERP) system. Those new records are then sent to the hub via middleware for cleansing, matching, and possible merging, and then synchronized to other systems around the enterprise.

But a defining capability of proactive data governance is that business users interact with the MDM hub and do at least some of their data entry directly into the hub. However, that requires a much more robust and user-friendly interface than is typically found in an MDM hub and requires significantly more collaboration features as well.

For delivery of proactive data governance, the user interface is critical, and it needs to be configurable (without programming) to support the different skill levels and security profiles of end users. These types range from casual users interested only in occasionally entering new customers, products or assets, to sophisticated data stewards who must respond to data quality issues sent via workflow by other users.

The ability to dynamically generate new, easy-to-use variations of the user interface through configuration rather than programming (and update the user interface easily when the data model changes) is another key feature that should be considered in an MDM evaluation.

### 3 Is there Sophisticated Hierarchy Management that's Easy to Use?

Hierarchies, widely used in master data management, are a great way of organizing and presenting most types of master data. Each domain has its own subtleties. For example, in customer MDM, business customers are managed in a corporate hierarchy or "family tree", which can be quite complex. Large companies like General Electric or Tyco can have more than 1,000 members in their family tree. Consumer customers have much simpler hierarchies; typically they are basic households representing the people living at a particular physical address.

There are also classification schemes like Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS), both of which are used to classify businesses by industry. Classification functionality is usually included with hierarchy management because each is used to better understand the customer.

In Finance and HR, business users must maintain complex, multi-dimensional views of the organization. Organizational units can be attached to geographies, legal entities, business groups, functions or markets, based on complex relationships, rollup levels and business rules.

Product hierarchies or taxonomies can be quite complex as well, as each company usually defines its own and there are no widely accepted standards. Generally, there is more than one product taxonomy – including bills of material, product/product line/product family rollups and financial reporting breakouts. The position in a product hierarchy usually drives the definition of a new product's attributes.

The various hierarchies, classifications, and taxonomies that must be managed are just as critical as the core master data, particularly since they can have a big effect on downstream reporting and analytics.

Well-designed, graphical, easy-to-use hierarchy management functionality with "what if" capabilities and the ability to easily move a hierarchy's branches are important features to look for in evaluating MDM technology.

### 4 Version Control for Master and Reference Data – a "Must Have" Feature

Certain types of master data, particularly organizational hierarchies, financial information, shared reference data, sales territory definitions, etc., lend themselves to being managed through advanced version control. That is, there is a current version of the data (production) and a future version that is still being worked on, hasn't been approved yet, or simply hasn't arrived at a given point in time. Past states of the data are useful as well, to show how things were for comparison, historical, previous processes, or audit purposes.

Accuracy of this information is critical, as it allows a future state to be created ahead of time (e.g., a new organizational structure of the company) and for it to be approved using workflow, but for it not to take effect until the appropriate date arrives. It can also be used to highlight new sales territories that will be created, and then to generate reports comparing the new territories to existing territories.

The ability to manage different versions of the data (past, present and future), along with a robust audit trail, is an important capability you don't find very often. Many MDM tools that evolved from ERP products or Customer Data Integration software don't provide fine-grained version control or audit trail capabilities since when those solutions were first designed, databases weren't capable of delivering those features with decent performance. Although over the past few years this issue has been addressed, most MDM platforms have not gone back and formally added those features to their product.

Version control is a significant feature to consider since it's incredibly valuable to give your data stewards the ability to cleanly create a new version of a critical reference data list or enterprise hierarchy, without disturbing the existing production view. And in today's regulatory compliance climate, having the ability to show every change to a significant master data item is a "must have" capability.

## 5 Does the Solution Provide Built-in Workflow for Collaboration, Approvals and Change Management?

A big part of proactive data governance is being able to use a built-in workflow tool for the approval and change management of critical master data and reference data items. Some items must be tightly controlled, such as the company's fiscal calendar and organizational hierarchy and require fairly high level approvals when changes are made. Other items, such as a higher than normal credit limit, may also require the appropriate business manager's approval.

Data stewards also make changes requiring approval—adding new reference data values or merging two high-value customer accounts, for example. And IT stewards, who support the hub from an administrative perspective, occasionally make changes like correcting data quality issues on small numbers of imported records or automatically populating a new column in the data model based on a business rule—all of which require approvals.

A sophisticated workflow tool built right into the MDM hub gives all business users the ability to create events which other users will handle and a "pending item" queue that notifies them via e-mail when they have a new event to handle. This is a basic requirement but one that truly elevates the productivity of the MDM hub to a much higher level.

## 6 Is there Standards-Driven Role-Based Security?

Many project teams take a fairly restrictive view to granting security privileges. For most users, "Read" access to master data items is enough (except, of course, for company confidential information like employee salaries, etc.). "Create" access is usually restricted to a smaller group of business users who are trained in the correct process for creating a new customer, product, etc. data. "Update" and "Delete" access are generally tightly restricted by most companies, since that's where the most damage can be done.

But most project teams wind up wishing for more fine-grained control – over groups instead of individual users, over individual columns instead of entire tables, even down to the business rule level – saying in effect, this user can do this, unless this condition or that condition is true.

Being able to connect to widely-used directories such as Lightweight Directory Access Protocol (LDAP) and Active Directory (AD) is also very helpful. Most enterprises have already adopted these technologies for their networks. MDM platforms that don't support them force teams to re-enter user and security privileges, which wastes administrative effort and provides opportunity for typos and other snafus.

A strong security model for your master data is an essential part of a well thought out MDM strategy. A robust MDM hub should provide for configuring access privileges by data domain, table or individual attribute, with the right balance of flexibility and control to meet the needs of your organization.

Also, make sure that the security model is available when services are invoked from outside the MDM hub, since your “users” may frequently access MDM functionality from outside applications using web services.

## 7 What Advanced Productivity Features does the Solution Provide?

Many master data items are similar to one another or can be defaulted from a standard definition. For example, you can define a product taxonomy, where the grouping of products into hierarchy nodes determines their default attributes, when you define a new product.

A sophisticated inheritance engine means that whenever you define a new master data object, you have a choice of inheriting its attributes in several useful ways – via a different MDM instance, another MDM object, between objects in a hierarchy, through a business rule, etc.

Other productivity features to look for include the ability to import and export data in a wide variety of formats, including XML, tab-delimited text files, Comma Separated Values files and Excel files, etc.

The biggest productivity feature of all is not having to rekey data between multiple systems, and not maintaining critical business information in fragile, manual labor intensive formats such as spreadsheets and word processing documents.

## 8 Are there Standards-Based, Middleware-Neutral Integration Capabilities?

No MDM hub vendor can anticipate the wide variety of middleware and data integration platforms in use, but your hub should cover the spectrum of offerings from vendors such as IBM, Oracle, Microsoft, Informatica, Tibco, and Software AG webMethods.

Master data management and service-oriented architecture are used together so frequently that it is important that your hub provide easy, model-driven, out-of-the-box support for web services and widely-used enterprise services bus platforms.

One of the best ways to unlock value in your MDM initiative is to make the capabilities in your hub widely available via enterprise services. The best way to achieve this is through dynamically defined web services that can scale and add new capabilities as easily as you add them to your hub. Your return on investment from your hub will multiply as you add new groups of users around the global enterprise who can tap into the functionality you’ve built and into the clean, accurate, timely and consistent data the hub provides.

There are two ways of increasing your return on investment from MDM. First, increase the return for your existing user base by offering more functionality. Next, spread your costs out over a wider user community through web services made available through an enterprise service bus. This allows more people and groups to take advantage of the MDM hub.

*“Data governance capabilities are a critical element. Consider these eight key aspects as you make your MDM technology decisions.”*

## Going beyond MDM to a Next Generation Data Governance Platform

So a next generation data governance platform has the characteristics described above:

- Flexible Data Modeling
- Collaborative User Interface
- Sophisticated Hierarchy Management
- Advanced Version Control
- Built-in Workflow
- Role-Based Security
- Productivity Features
- Middleware-Neutral Integration

Today, most MDM vendor products deliver a fragmented approach: one platform for customer master data and another platform for product master data. Although all MDM vendors are working on a unified platform that handles customer and product equally well, the large vendors are not there yet.

Several of the smaller, independent MDM vendors are able to fill this void and are continuing to add marquee customers.

A major advantage of going beyond this fragmented approach with a next generation, proactive data governance platform is that you can incorporate the flexible, model-driven approach and the proactive data governance we've discussed in this paper in one solution from one vendor. You can avoid recreating the silos (which have caused so much havoc in the CRM and ERP worlds) in your MDM technology stack.

A single multidomain data governance platform enables your business to:

- learn to model and manage its data,
- define security and create collaborative workflows,
- establish version control and author new master data,
- connect to middleware using data services to publish results, and
- federate geographically and via enterprise services to support worldwide organizations.

This gives the business control over the entire MDM lifecycle:

- It starts with understanding the business and modeling its data in the data governance platform, as well as building business rules that capture the complexity of how your business operates in the real world. The data model becomes self-documenting and can accommodate multiple languages, taking into account your operations around the globe.
- Then, the business will define the security layer and the workflow definition, controlling who has access to what data and how information should flow through the process. Some tasks will be handled by end users, some by data stewards, and some by automatic programs, based on conditions and rules.
- Version control means that past, present and future versions of the reference and master data are under the business's complete control, as is the process of authoring new master data.

- A middleware-neutral philosophy means that the IT team should be able to connect the data governance platform to just about any major middleware solution, making the process of publishing results to the rest of the enterprise a straightforward one.
- The underlying technology should also provide geographic federation to support global enterprises, so a single hub can enable rapid global implementation, or a set of regional hubs can be connected in a service-oriented architecture, depending on the business requirements.

This level of precision, performance and results has been shown to improve the global competitiveness and the bottom line of most large enterprises: it represents a big step ahead in the MDM market as a whole.

Having the ability to put the business in control through the model-driven approach is a huge productivity improvement. When changes are made in the underlying model for the MDM solution, they immediately take effect without having to wait for an IT person to make the change.

## A Model-Driven Approach and Proactive Data Governance Deliver Multidomain MDM Today

The combination of the model-driven approach and proactive data governance frees the business up from the constraints of customer- and product-centric hubs. Since you can model any data structure, you're not limited to the pre-established tables and columns that the software vendor built into the data model. Once you get used to this freedom, you'll never want to go back to a rigid, pre-built data model again.

The model-driven approach also gives the ability to leverage your existing assets by re-using data models from both internal and external sources, including available industry standards.

The whole intent of proactive data governance is to put the business in the driver's seat. Between the flexible data modeling, collaborative user interfaces, easy-to-use hierarchy management, advanced version control, built-in workflow, role-based security, productivity features, and the middleware integration, the business becomes an equal partner of IT.

Since master data management programs tend to be more successful when business people are actively engaged from the very beginning, having the business participate on an equal footing with IT is a huge step forward. The business team can participate in the project, and the IT team can concentrate on the challenging technical parts of the project that involve middleware, data quality, databases, performance engineering, testing, etc.

According to "Software Maintenance" by Gerardo Canfora and Aniello Cimitile, "software maintenance consumes 60% to 80% of the total life cycle costs"<sup>3</sup>. So for every \$1 spent on initial development, roughly \$4 in maintenance costs is incurred over the lifetime of the application. Having the business participate in the maintenance of the MDM and data governance platform dramatically reduces IT costs.

And multidomain MDM is needed to solve the most challenging business problems. For example: when you are tracking physician spending in the pharmaceutical industry, you're usually pulling in many different types of master data: product (different types of drugs and devices), internal parties (employees, i.e., salespeople working with different physicians), external parties (healthcare providers, i.e., physicians), locations (states to which you have to report spending), etc.

So a customer-centric or product-centric MDM platform can quickly become a problem. Either the software vendor will do or has already done the customization needed, or you'll have to. Solving today's business problems can require data from as many as seventy different domains of data.

---

<sup>3</sup> University of Sannio, Gerardo Canfora and Aniello Cimitile, "Software Maintenance" (Benevento Italy, 2000)

But the model-driven approach we've discussed here, combined with the proactive style of data governance we've previously recommended, delivers multidomain MDM today. The model-driven approach allows all domains of data to be incorporated into the MDM hub's data model on an equal basis. And the proactive data governance model includes the business in the entire MDM life cycle, so business owners, end users and data stewards are involved in every step of solving the tough business problems using the data governance platform.

## Summary

A flexible, model-driven master data management platform and methodology, combined with a proactive style of data governance, is an approach that should be considered by all enterprises looking to select a single MDM and data governance platform to manage master data and reference data globally.

At the same time, enterprise MDM initiative owners, in collaboration with their CIOs, have the opportunity to consider a host of related technology architecture investments such as an enterprise service bus, service-oriented architecture, an enterprise architecture group, a data governance council, etc.

In those cases, a model-driven approach and proactive data governance are exactly the right choice, because of the better short term return on investment; faster implementation times; better long term growth path; ability to avoid "MDM silos" and redundant investments; reduced IT costs due to involving business in building and maintaining the hub solution; and increased user satisfaction.

At some point, the model-driven hub and the proactive style of data governance may be the norm, but currently, most vendors are still working from predetermined data models and a more reactive style of data governance. We always recommend completing a thorough evaluation and selection on MDM technology, so we hope this white paper and the eight aspects we've covered will give you the guidance you need when you are evaluating MDM vendors against one another.

And while some companies have historically implemented separate Customer Data Integration (CDI) or Product Information Management (PIM) hubs, more are now going directly to a true multidomain hub like the one described here. The future lies with vendors who provide true multidomain MDM technology with proactive data governance capabilities.

## About the Author

Dan Power is the founder and president of Hub Solution Designs, Inc. He has more than twenty years of experience in management consulting, enterprise technology, and strategic alliances at companies like Dun & Bradstreet, Deloitte Touche Tohmatsu, and Computer Sciences Corporation. Mr. Power is a well known author, blogger and speaker, and advises software firms and commercial clients on MDM and data governance.

## About Hub Solution Designs, Inc.

Hub Solution Designs, Inc. is a global management and technology consulting firm that specializes in developing and delivering high value master data management and data governance strategies. Through recognized thought leadership, an excellent reputation and a strategic network of partnerships, the firm delivers successful projects to Fortune 1000 clients, who are its best references.

Hub Solution Designs, Inc.  
188 Whiting Street, Suite 3  
Hingham, MA 02043-3844 USA  
(781) 749-8910 office

[www.hubdesigns.com](http://www.hubdesigns.com)  
[blog.hubdesigns.com](http://blog.hubdesigns.com)  
[info@hubdesigns.com](mailto:info@hubdesigns.com)  
(781) 735-0318 fax

Hub  
Solution  
Designs 

## Sponsored by Orchestra Networks

Orchestra Networks provides the next generation of Data Governance / MDM software, with a clear focus on governance for all shared data across an organization. The model-driven approach with its dynamic user interface and data services provides the means for business and IT to finally collaborate on MDM. Founded in 2000, Orchestra Networks has a global presence and customers worldwide.

[www.orchestranetworks.com](http://www.orchestranetworks.com)



Copyright © 2010 by Hub Solution Designs, Inc. and Orchestra Networks. All rights reserved. Hub Solution Designs and the Hub Solution Designs logo are trademarks of Hub Solution Designs, Inc. Orchestra Networks and Orchestra Networks logo are trademarks of Orchestra Networks. All other brands and product names are trademarks or registered trademarks of their respective companies.