Extending the Value of MDM Through Data Virtualization

Perspective on how data virtualization adds business value to MDM implementations

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A Whitepaper by Dirk Garner

Audience
- Business Stakeholders
- Line of Business Managers
- Enterprise Solution Architects
- C-Suite Executives: CDO, CIO, CTO

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Overview

Accurate, timely, and whole information assets are critical to success in this fast-moving business climate. By the time complicated IT Projects deliver this information capability it is likely to be out of date. The combination of two complimentary agile technologies, data virtualization and agile Master Data Management, when paired together, can provide a new approach to getting all relevant information in the right place at the right time. This paper provides an overview of both of these empowering technologies and how they can work together to solve complicated enterprise data integration and quality issues.

A Brief History of Data Virtualization

What is Data Virtualization?

Data Virtualization provides agile data integration capabilities that accelerate data exploration, discovery, and blending for analytics, data science, BI initiatives and general use. It unleashes the power of self-sufficiency for business analysts and power-users to create as-needed custom views that display information precisely as they'd like for each unique business initiative. Data Virtualization empowers businesses via rapid data discovery, unified data accessibility, and the efficiencies of shared, standardized, re-usable data views.

How Data Virtualization Works

Data Virtualization abstracts and simplifies the complexity of locating, joining, and filtering multiple simultaneous data sources in near real-time without the need to copy or pre-load data. Even complicated transformations, cleansing, and aggregations can easily be performed without the need for advanced SQL development skills by providing a drag-and-drop GUI interface that visualizes data integration rather than forcing an analyst to navigate complicated SQL code.
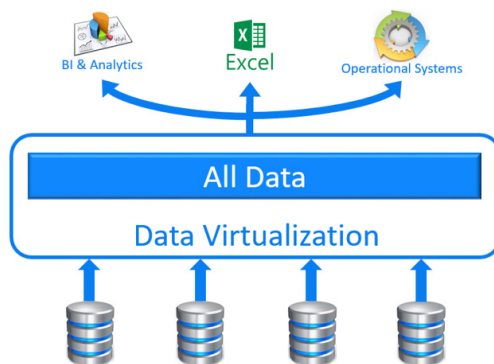
The Value of Data Virtualization

Data virtualization is a truly agile form of data integration and provides immediate and performant access to diverse data sets, enables faster time-to-market, and facilitates more focused and relevant utilization of data assets. Data virtualization can save countless hours by eliminating typical roadblocks such as unavailable or inaccessible data, the need of funding for ETL projects, and the confidence-decaying headaches of inconsistent metric calculations caused by data redundancy.

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A Master Data Management Overview

Master Data Management (MDM) is a data governance methodology intended to ensure that companies do not act on multiple or inaccurate versions of entities (such as a customer, product, employee, or supplier) due to data integrity problems caused by multiple and/or ungoverned data source systems that handle the same or similar data in different manners or under different rules and protocols.

MDM does this systematically and procedurally by analyzing data from multiple source systems within the same master domain, cleaning up data anomalies, duplications, and inaccuracies, and assembling a single accurate perspective of each individual entity within each domain. These singular consolidated records are referred to as golden records. These unique individualized records may or may not conform to the definitions and criteria of their originating counterparts within the source production systems. Each individual entity has one, and only one, golden record representing the most complete and accurate information available about that entity and represents the enterprise version of itself rather than a departmental version.

Value of MDM

Having the most recent information at hand, via the golden record, allows downstream systems and humans alike to make better decisions leading to business-improving outcomes such as increased sales, higher customer satisfaction, and reduced call center traffic, all of which improve the business' bottom line, reputation and profitability. Perhaps the biggest return on any MDM effort is the reduction or elimination of the embarrassing, costly, and potentially legal or health threatening impacts of bad data that is not mastered at all, or that is not mastered correctly, completely, or expediently.

> **"The Data Warehousing Institute (TDWI) estimates that data quality problems cost U.S. businesses more than $600 billion a year"**

An MDM Real-World Example

To provide a real-world example of how MDM improves business, let's consider the challenges of email synchronization. If a customer's preferences are stored in a preference management system but email marketing campaign information is housed in an email marketing platform and a customer changes her preferred email address, the possible outcomes of this engagement might be very different depending on whether the organization has implemented a successful MDM process.

Without MDM, there may be no synchronization process to update the customer's new email address in the email marketing database and it is possible that the email addresses stored in the email marketing database were extracted from the customer database long ago when the system was originally installed, and has not been

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updated since. If this is the case, as it frequently is, when a new email campaign is launched, the customer will not receive the email in the expected inbox but rather in the previous email inbox configured before the preference was changed. In this example, the customer might experience curiosity at best, and annoyance, irritation, or loss of brand loyalty at worst. Situations like these may go unnoticed or unprioritized by the staff best suited to remedy them for months or even years.
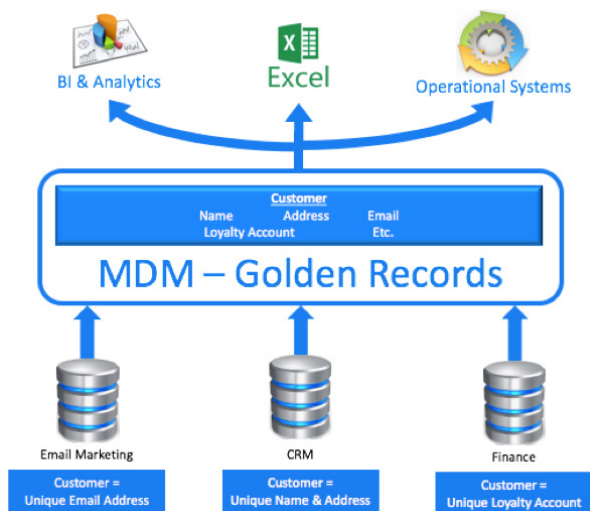
However, with MDM, this situation and many others just like it, would have a much more successful outcome. With MDM, an email marketing campaign's address listing would be synchronized frequently, avoiding embarrassment, customer irritation, and potentially even legal costs. With MDM, the email marketing database would work with the latest information available, meaning that once the customer changed their email address in a preference management system, the MDM system would pick up that change and process it per business rules and make it available to other systems on demand or by pushing it out to other systems such as the email marketing database. In this case our customer would receive her email in the correct inbox resulting in a pleasing outcome. MDM goes far beyond providing mere satisfaction that a customer's preferences were acknowledged and utilized, or that the correct product was delivered regardless of how many similar products of different colors and sizes share the same SKU, or ensuring that a shipment is delivered to the address chosen and billed to the preferred credit card regardless of which address and payment methods were previously stored in various systems throughout the enterprise. Mastering data simplifies service issues, reduces churn, heads off lost sales, bolsters reputation, and builds loyalty.

MDM Challenges of Growth and Scaling

Vertical MDM Solutions

Most commonly, organizations will initially focus on mastering customer data. The biggest potential ROI generally lies here because of all the customer touch points where data is collected and that data controls. But there is no reason to stop with a successful customer MDM system. Mastering product, vendors, employees, and so on, will provide many advantages and financial improvement for your organization.

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Prior to today's multi-domain MDM packages becoming popular, many companies relied upon domain-specific software packages that specialized in a single domain, in a specialized manner, leaving organizations that wanted to master additional domains, with the need to purchase multiple MDM systems from multiple vendors each specializing in a specific area of business. Later, as new vendors entered the market with multi-domain offerings that could master all domains, many companies that had not yet pursued MDM or who were interested in a more holistic solution, implemented these multi-domain products that can greatly simplify enterprise MDM. Today, next-generation solutions are multi-vector MDM; this means they are not only multi-domain, but also multi-style, multi-use case and multi-industry. This new reality makes enterprise MDM a real possibility for many companies.

Organizations saddled with the conventional MDM solutions generally have multiple, siloed MDM domains. For them, problems will emerge and the ability to provide a comprehensive view of the enterprise becomes seemingly impossible.

Multiple Departmental Masters

In situations where it just isn't possible to come to agreement regarding a common enterprise definition of a golden record for a customer, product, employee or some other data domain, some organizations have implemented multiple MDM solutions for the same data domain in more than one department.

In these scenarios, Finance may have a customer MDM hub, Sales may have another customer MDM, and Marketing yet another—all representing the same customers! Possible causes for these departmental siloed MDM efforts are geographic, cultural, and monetary differences in customer, product, and employee definitions, and internal challenges such as departmental, technical, or strategic differences.

Although these departmental solutions may fit each group's individual needs, it creates a larger problem, which results in technical/intellectual debt for the enterprise. The inability to see these entities in a common view at the enterprise level makes enterprise reporting, and thus enterprise strategy, essentially impossible.

Data Growth and Organization Scaling

Whether due to market share growth, mergers, or some other driver, business growth can cause numerous headaches for MDM system owners. As the data grows due to additional customers, suppliers, transactions, and so on, the resources required to store, analyze and synchronize this data grows as well, sometimes exponentially. This growth typically causes inconsistencies and inaccuracies of data, even within the golden records which reduces the value of your information assets. This can be due to slow data processing and data transfer times. Additionally, as the number of different entities grows within each domain, there will be increased occurrences of similarities and coincidences that will push fuzzy-matching logic to its limits leaving vulnerabilities of inappropriate record merging, data updates, and record exclusions as another potential MDM scaling concern.

Time to Value

MDM systems whether they are single or multi- domain, vertical specific or

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departmental have all earned a reputation for taking months if not years to implement, resulting in little or no values for the first two to three years. As critical as accurate data is to many businesses, MDM solutions need to have shorter implementations, demonstrate value to the business quickly and have the capabilities to evolve as business requirements change. Technologies and practitioners who understand how to leverage agile, interactive approaches to MDM will be preferred as the market evolves.

Advantages of Pairing MDM & Data Virtualization

Data virtualization can provide significant advantages in MDM projects and architectures in three primary areas: prototyping, consolidation, and enrichment. With the ability to quickly assemble and modify views, unify data in a performant manner, and flexibly provide data to consuming business systems, data virtualization has many benefits that are complimentary to MDM technologies. Data virtualization can add value throughout the life of an MDM project by leveraging its capabilities of data caching for performance, web service provision for interoperability, and provides flexible data consumption via familiar query and BI tools, Excel, file transfer, and REST APIs.

Prototyping

Data virtualization can be leveraged in early phases of MDM projects to provide quick, simple prototyping of domain data elements and quick views of what a planned golden record might look like. These activities can boost the speed of requirements gathering, but more importantly, they can help avoid unforeseen implementation issues with data cleansing and mastering rules by creating a working model up front. This approach works especially well when used with an agile MDM methodology. It can also have the benefit of demonstrating not only a technically viable solution, but it can also show immediate value to the business stakeholders. Once this working model is established, development can be based on this model helping to avoid late design call-outs which could derail project schedules, or cancel an MDM effort altogether. Further, considering data virtualization capabilities of caching and web service provision there may be certain instances, for small datasets, in which it makes the most sense to develop the prototype to a point at which it could fully participate in the final MDM solution thus avoiding additional development work.

Consolidating Multiple Masters into an Enterprise Master View

For organizations with multiple departmental MDM solutions for the same domain, a true golden record can be out of reach shutting them out from the benefits of having enterprise master data entities. Data virtualization can combine one or more of these individual MDM systems and present one common semantically consistent "golden record" combining the most appropriate data elements from each departmental system -- all in real time. The entire company could greatly benefit by using a consolidated, standardized, enterprise golden record that includes all relevant information and is interoperable with all other enterprise systems, eliminating manual reconciliation previously needed to account for redundant or conflicting mastered data.

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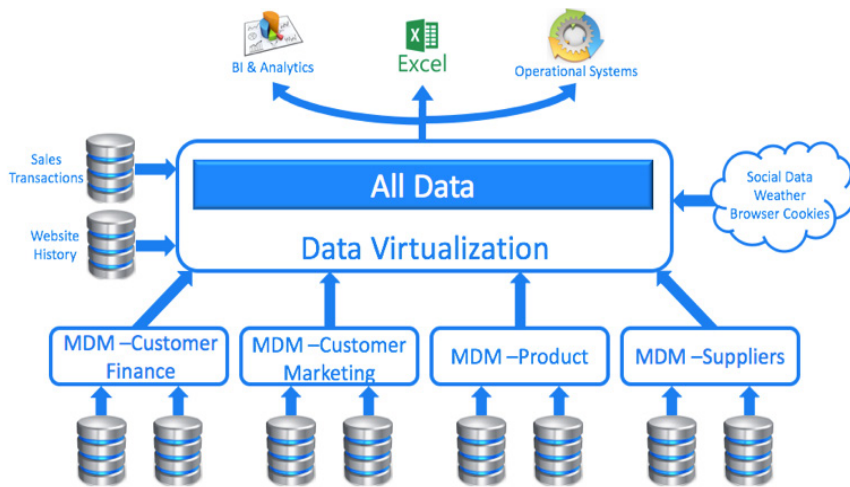
Consolidating Multiple Domains into a Comprehensive Enterprise View

Many organizations have implemented single-domain MDM solutions either due to the limited MDM Vendor selection at the time of implementation or due to extremely precise mastering requirements warranting a domain-specific package. Data virtualization can help MDM go the last mile for these organizations by combining these siloed MDM systems into a common enterprise view accessible by all systems, processes, and end-users. Downstream systems can connect to a single location to retrieve all mastered data with confidence that it is accurate, whole, and up to date.

Enriched MDM / 360 View

Data virtualization uses the power of data unification to present data from sources that you would not normally master but that contain valuable data that enriches and describes with insightful facts such as social sentiment, customer journey, recent navigation, preferences, and so on. This data can be presented in tandem with the golden record providing a fuller more comprehensive and more valuable perspective into any mastered entity.

	Customer 360°	Product 360°	Employee 360°
Additional Data	• Transaction history • Customer • Service history • Billing history • Browsing activity • Recent interactions	• Product demand information • Inventory location and levels • Product reviews • Safety and defect information	• Enrolled Benefits • Compensation • Performance reviews • Social profiles
Benefit	• Cross Sell / Up Sell • IncreasedSatisfaction • Improve Loyalty • Reduce churn	• Supply chain optimization • Eliminate redundancy • Cost reduction • Increase engagement	• Improve retention • Productivity gains • HR self-service

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Conclusion

With the business ecosystem changing rapidly and dramatically and including evermore data systems such as Big Data and Internet of Things, it is hard to predict what our data management needs will be in one year much less five years from now. Multi-vector MDM, data virtualization, and other data governance and data integration tools that are agile and flexible can make the difference between your company adapting and thriving, or being forced to replace systems once the business environment changes. MDM and data virtualization working together can help set the stage for your company to be successful in this new era of data management and beyond.

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Garner Consulting provides research advisory and consulting services supporting data strategy, technology architecture, and business evolution.

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Semarchy is the Intelligent MDM™ company. Its xDM platform is an innovation in multi-vector Master Data Management (MDM) that leverages smart algorithms and material design to simplify data stewardship, governance and integration. It is implemented via an agile and iterative approach that delivers business value almost immediately, and scales to meet enterprise complexity. The technology is in use at some of the most well-known B2B, B2C, consumer and product brands in the US and Europe, supporting all domains, styles, organizations, industries and use cases in one environment that adapts to evolving business requirements.

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