

Field Report: Oracle DRM for Reference Data Management

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Why is “Reference Data Management” So Important?

Reference Data Management (RDM) is a relatively new offspring of Master Data Management (MDM) functionality. RDM provides the processes and technologies for recognizing, harmonizing and sharing coded, relatively static data sets for “reference” by multiple constituencies (people, systems, and other master data domains). Certain MDM vendors such as IBM and SAP have re-purposed their MDM hub functionality to manage reference data as a special type of master data. Such a system provides governance, process, security, and audit control around the mastering of reference data. In addition, RDM systems also manage complex mappings between different reference data representations and different data domains across the enterprise. Most contemporary RDM systems also provide a service-oriented architecture (SOA) service layer for the sharing of such reference data.

Prior to the availability of commercial RDM solutions, organizations built custom solutions using existing software such as RDBMS, spreadsheets, workflow software (business process management or BPM) and other tools. Such systems often lacked change management, audit controls, and granular security/permissions. As a result, these legacy solutions have increasingly become compliance risks. Because reference data is used to drive key business processes and application logic, errors in reference data can have a major negative and multiplicative business impact. Mismatches in reference data impact the integrity of BI reports and are a common source of application integration failure. Just as businesses no longer build their own CRM, ERP, and MDM systems, so too are organizations beginning to acquire commercial RDM solutions, which can be easily tailored or configured and have the full ongoing support of a major software vendor.

Within the realm of commercial RDM solutions, there are two main families: “multi-domain RDM,” and “real-time RDM”. “Multi-domain RDM” solutions are non-industry specific solutions that can span functional areas (finance, risk and compliance, human resources) and content types (ISO country codes, and other non-volatile reference data to be mastered and shared). “Real-time RDM” is typically a very high performance solution for use in the capital markets industry (brokers, asset managers, and securities services firms) as well as command and control military/intelligence markets.

During 2015-16, we believe a great amount of current and next-generation commerce will be facilitated by on-premises and cloud-based RDM solutions that support both “private” and “public” reference data. “Public” reference data is what many people typically think of when they consider reference data. Public reference data is based on standards where overall consistency is a primary goal. Examples of public reference data include industry standards (GS1 GPC), national standards (FIP 10-4, US Census MSA/CSA), International Standards (ISO, ISIC), and data from vendors (Bloomberg, D&B, S&P). “Private” reference data is used to maintain consistency when doing business with external parties. Examples of private reference data include financial and organizational hierarchies, and employee organizational structures. Mapping logical connections between different master data domains and reference data illustrates that both kinds of reference data (public and private) have a large number of connections to every MDM domain. This means that an error in reference data will ripple outwards affecting the quality of the master data in each domain, which in turn affects the quality in all dependent transactional systems. The heavily interconnected nature of reference data is why it requires separate management and governance.

Clearly, Reference Data Management is a major IT initiative being undertaken by a large number of market-leading global 5000 enterprises. Both as an IT discipline and a commercial off-the-shelf software

solution, RDM solutions are being brought to market at an increasing pace. Additionally, RDM is a good entry-level project to show success for initial MDM investment which can be built on as a data governance model.

BOTTOM LINE: Oracle's Data Relationship Management (DRM) is a proven multi-domain RDM solution. Due to the highly inter-related nature of reference data and DRM's roots in chart of accounts management as well as enterprise dimension management, Oracle DRM is an especially excellent choice as a flexible and scalable RDM solution to provide management of enterprise reference data assets with high impact on operational, and business analytics and reporting applications. Additionally, its strong data governance workflow, best-in-class hierarchy management and version control features address the need for RDM governance ("enterprise data governance") by promoting collaboration and consensus across functional stakeholders. During 2015-16, organizations evaluating RDM solutions should review their use cases and consider the Oracle DRM solution for RDM and data governance applications – independent of other MDM investments.

The "Field Report" Methodology

2015-16 "MDM & Data Governance Road Map". Part of the deliverables for our client Advisory Council is an annual set of milestones to serve as a "road map" to help Global 5000 enterprises focus efforts for their own MDM programs. For planning purposes, we thus annually identify ten milestones that we then explore, refine and publish via our MDM Alert research newsletter. This set of "strategic planning assumptions" presents an experience-based view of the key trends and issues facing IT organizations by highlighting: MDM, Data Governance, Customer Data Integration (CDI), Product Information Management (PIM), and Reference Data Management (RDM).

Thus the 2015-16 MDM road map helps Global 5000 enterprises (and IT vendors selling into this space) utilize these "strategic planning assumptions" to help focus their own road maps on large-scale and mission-critical MDM projects. During the following year, we use these milestones as the focus for our analyst research in that every research report we write either confirms or evolves one or more milestones as its premise:

1. Pervasive MDM
2. Data governance
3. Business process hubs
4. Universal MDM
5. Reference data
6. Social MDM
7. Identity resolution
8. Big data
9. Business-critical MDM
10. Budgets/skills

As an industry-funded multi-client study, the MDM Institute is releasing its **"Reference Data Management: Market Review & Forecast for 2015-16"** during 2H2015. Among other benefits, this industry report provides insights into: what is RDM, what are the business drivers for RDM, what are the major use cases, what are the technical challenges, who are the major solution providers (software vendors and consultancies), how to evaluate such solutions, and what are the best practices for RDM in the large enterprise. Additionally, the MDM Institute is providing a series of Field Reports that will provide details on the merits and caveats of the variously marketed commercial multi-domain RDM solutions.

The majority of this Field Report on Oracle DRM for RDM capabilities therefore represents our analyst opinion buttressed by in-depth reviews, evaluations and (often) hands-on proof-of-concepts executed by the membership of the MDM Institute's Advisory Council.

Evolution of Oracle DRM as a Reference Data Management Solution

Although Oracle DRM is perhaps best known as the enabling technology for Oracle's Hyperion Enterprise Performance Management (EPM) solution, DRM has also historically been widely deployed as an RDM solution. Specifically, this has been a frequent use case wherein an organization took advantage of DRM's strong hierarchy capability to deploy multi-domain RDM solutions for various transaction types, codes, code combinations, mappings, business taxonomies and reporting structures (e.g., geographic regions, industry classifications, market segments, product categories, etc.), as well as approval group structures, job codes, role hierarchies, and the like. With the addition of Oracle Data Relationship Governance (DRG), the combined offering provides a model-driven, configuration-based, contextual workflow solution to enable front-line business users to self manage their reference data. As a result, we often see a natural progression of such DRM use cases, frequently starting with RDM of Finance data within the EPM solution set and evolving into other MDM use cases, especially management of other reference data domains.

Additionally, while there have been a number of RDM solutions that specifically address the straight through processing (STP) and real-time requirements of the capital markets industry (i.e., Asset Control, Eagle, GoldenSource, et al), **Oracle's DRM product is arguably a 4th generation MDM hub (SOA architecture, integrated data governance) that has found frequent uptake as an RDM solution in large enterprises.**

In short, Oracle's DRM provides out-of-the-box RDM services to centrally create, change, govern and distribute reference master data across an enterprise's entire landscape.

In our informal survey of the Oracle DRM customer base, we found the product used as an RDM solution in more than half of their customer base (350+ of the ~700 DRM sites known to us).

Concurrently, we have found that many IT departments are willing to consider a standalone RDM solution as an adjunct to their mega vendor MDM (e.g., IBM, Informatica, Oracle or SAP). This is because IT departments have found that MDM solutions that are designed for a specific domain such as Customer (Informatica MDM, IBM MDM Server) or Product (PIM solutions) are harder to adapt to RDM requirements. A not infrequent use case for Oracle-centric organizations is to use Oracle DRM either alongside Oracle Universal Customer Manager (UCM) to augment that MDM platforms' capabilities or to use it as a multi-domain foundation for MDM purposes. As further proof points, we found that the Oracle DRM product has already been tested and vetted as an RDM solution at a number of large global enterprises such as Cisco, Gilead Sciences, Levi Strauss, National Australia Bank, NetApp, Nokia, Starbucks and Visa for both "public" and "private" forms of reference data.

Figure 1 – Oracle DRM History

- *Oracle DRM originated as the MDM component within Hyperion Solutions Enterprise Performance Management (EPM) product family.*
- *Specifically, its earliest origins were as an MDM hub sold as Razza Solutions which was the outcome of a custom consulting project at a very large Midwestern bank.*
- *The bank was very successful in M&A of other banks & needed to track all its acquired companies to report up into a consolidated statement to Wall Street.*
- *Originally, a PC-based solution, DRM has been re-platformed several times – first as client-server, then web form enabled, & most recently as graph data model, 64-bit OS, in-memory engine & Exadata-certified; next up? Cloud native scalability.*

Source: The MDM Institute

Summary Evaluation - Top 10 Evaluation Criteria

As part of the interactions with its Customer Advisory Council, the MDM Institute captures and promotes models such as "top 10 evaluation criteria" for key MDM-related technologies and areas of interest. During 1H2015 and as part of the background research for the much more comprehensive "**Reference Data Management: Market Review & Forecast for 2015-16**" report, more than thirty Global 5000 size enterprises shared their software evaluation processes and also contributed commentary and supporting details for a set of "top 10" evaluation criteria for RDM solutions. These evaluation criteria (figure 1) are discussed in more detail in the above referenced market study. The majority of this Field Report in turn takes these "top 10" evaluation criteria as a framework to discuss and understand the capabilities of Oracle DRM as an RDM Hub.

1. Ability to Map Reference Data — An RDM hub must be able to manage application-specific or local adaptations of a reference data set (e.g., foreign language versions) along with canonical data sets. In addition, relationships between reference data sets should also be managed. With Oracle DRM, standard reference tables support both private (e.g., finance department) and public reference data (e.g., syndicated data such as DUNS and ISO and other standard reference data sets). Oracle DRM can accommodate most any reference data that the customer wants to draw into the model (via the business user interface). DRM supports 1:1, 1:many and many:many mappings between reference data value sets. Taxonomies and associations can be easily modeled within DRM to construct reference taxonomies (e.g., industry classifications, product categories, market segments) and reference data maps (e.g., crosswalk ICD-9 code sets with ICD-10 code sets). Furthermore, as changes are made to an application-specific reference data set, the data steward (subject matter expert or SME) can easily identify those changes and determine whether they require new entries to be created. Changes may also be fronted with tailored workflows to curate code changes or enable re-map activities essential to keep reference data sets accurate and relevant.

Figure 2 - Overview of Oracle DRM as an RDM Solution

STRENGTHS

1. **Integrated governance & robust RACI-style¹ security via collaborative Data Relationship Governance (DRG) module**
2. **Robust solution for business user-driven governance, management, stewardship & distribution of enterprise reference data & dimensions**
3. **Enterprise-scalable RDM solution (64 bit in memory, thin client) ... e.g., AngloAmerican/ DeBeers, BofA, Barclays, Cisco, GE, Gilead, Levi Strauss, NAB, NetApp, Starbucks, TD Bank, Verizon Wireless, Visa, Zions Bank, ...**
4. **Model-driven ease of deployment, implementation & use (built-in process flows & integration templates)**
5. **Support for temporal reference data (robust versioning, rollback & scenario modeling capabilities)**
6. **Strong support for workflows driven by dynamic business rules**
7. **Support for complex, multi-level & unbalanced hierarchies**
8. **Widespread availability of DRM consultancies (AdvancedEPM, Grant Thornton, The Hackett Group, Huron Consulting, MDM Strategies, ROLTA, Seismi, Serene, ...)**

CAVEATS

1. **Under invested in marketing**
2. **Shortage of DRM-knowledgeable consultancies**
3. **Lacking public Cloud offering – n.b. "Managed Cloud" available via Oracle Managed Cloud Services channel (previously a.k.a. "OracleOn-Demand")**

Source: The MDM Institute

¹ RACI - Responsible, Accountable, Consulted, Informed

2. Administration of Reference Data Types — One of the common problems with homegrown reference data solutions is that a single data model cannot easily represent the many different types of reference data required for the enterprise. The data model needs to be extended to support new reference data sets, and new properties specific to the varied types of reference data being managed. Because most MDM solutions use a relational DBMS approach, model changes require development work and IT intervention to enhance the repository, screens, and interfaces. This further reinforces the need for semantic or object-oriented modeling and implementation of reference data. DRM takes a configuration-based, model-driven approach to automatically generate the user interface and workflow processes essential to manage and master reference data.

3. Management of Reference Data Sets — Oracle DRM takes a consensus-driven approach to designing interactions between data stewards and front-line business users. Specifically, Oracle Data Relationship Governance (DRG) module provides stewards or reference data owners the power to tailor curation, enrichment and approval of reference data changes through the configuration of data-driven, contextual workflow models. This enables collaborative co-creation between cross-functional stakeholders across the front-office, back-office and performance management-office to deliver reference data sets that ensure business agility and promote trustworthy insights. By providing intuitive UIs and agile process automation for reference data stewards/SMEs/authors as well as information contributors and consumers, an enterprise can quickly install, configure and manage reference data with minimal ongoing IT involvement. With the business user as the design point, all of the UIs and stewardship processes are thus defined for RDM explicitly. This is in contrast to MDM solutions retrofitted to serve as RDM solutions. Such alternative RDM-via-custom-domain solutions typically entail more initial implementation work than a purpose-built/native RDM solution. In addition, the “custom build” approach usually requires additional development effort on an ongoing basis. Comparatively speaking, many other RDM solutions do *not* leverage the semantic/object data model but instead take a Swiss Army knife approach to RDM in that each RDM object type is implemented as a separate MDM domain.

4. Architecture/Performance — Oracle DRM takes a configuration-based, model-driven approach to mastering any business entity. This requires absolutely no coding on part of an implementing organization. With the combination of a fully extensible logical data model coupled with a variety application templates as modeling accelerators, Oracle DRM provides extreme time-to-value and low maintenance (minimal IT involvement). The product also takes an in-memory approach to managing value sets. End users select a version of information all of which is brought into memory to facilitate high performance automated attribute maintenance, and compare alternate business perspectives of historical, forward-looking and production views into fully reconciled master reference information assets. DRM leverages 64-bit architectures (H/W, OS) to deliver unlimited memory addressability as well as higher levels of concurrency to scale data processing as well as concurrent users. While Oracle DRM supports both Oracle and Microsoft SQL Server for its repository, it scales better with Oracle RDBMS and Exadata platforms.

5. Hierarchy Management Over Sets of Reference Data — Reference code tables can be either flat lists or have hierarchies. The hierarchical structure is a key aspect of reference data that needs to be managed in addition to the values and mapping relationships. For example, a hierarchy can be defined over values within a code table, or a hierarchy might be defined where each level is a code table in its own right. While the meaning of reference data elements have low rates of change, the relationships, or hierarchies, defined by reference data change more frequently as a business realigns its reporting structures and systems to match changing business requirements. A simple example is how a company may have several definitions of what is included in North America with an alternative reference data set where the Legal department view may include Mexico in North America, yet a Sales and Marketing view may consider Mexico as part of a Latin American grouping.

This need to customize, or adapt, reference data hierarchies and definitions manifests itself across all kinds of reference data — especially private reference data from the finance department or domain. For Finance, there

are often three main adaptations: tax, regulatory reporting, and managerial. However "privatized" reference data can cause problems if it loses its association with its original source. This is because sources continue to evolve (especially true for industry standards) and without lifecycle management and ties back to its "public" antecedent, the "privatized" set can quickly get out of sync (reducing the benefit of implementing a standard). This requires that the platform support adaptations while maintaining links to the original data set.

Oracle DRM provides support for cross-walking both "public" and "private" reference data sets. Common scenarios include mapping: (a) DUNS hierarchies to internal private corporate hierarchies; (b) enterprise risk management hierarchies (to manage credit risk, BASEL II/III, BCBC 239 compliance); (c) Salesforce.com organization structures to each other as well as downstream ERP applications; and (d) industry specific reference data sets for the entertainment, media and publishing verticals. Oracle DRM addresses both hierarchies and adaptations of master data. Unlike many other RDM platforms, DRM is acknowledged as widely deployed to manage complex product hierarches (e.g., CPG and Financial Services) and classification sets (i.e., what level that hierarchy points to in other sets). Via multi-level and (even) unbalanced hierarchies, DRM can be put to work to model business relationships without limitations.

6. Connectivity — It is vital that an RDM solution provide multiple, flexible means of connectivity to provide maximum "accessibility". Reference data must be made easily available to downstream application systems, remote subscribers, etc. Furthermore, each consumer of RDM data must be able to access the data in a means and format that is most convenient to them. Therefore, RDM solutions must be able to expose the reference data in multiple, flexible diverse ways such as: (a) on-demand access using SOAP or REST web services, (b) on-demand access or scheduled publication to flat and XML files, and (c) direct connections to remote databases. Each RDM channel must allow for retrieving either all data sets or lookups of specific entries. Oracle DRM supports these three connectivity styles.

7. Import and Export — The Oracle DRM solution provides import and export of reference data in multiple formats. For example, for inbound and outbound mappings from/to data definitions, sources and destinations such as flat files, file servers or databases, as well as CSV and XML formats. Wizards guide the DRM user through the process of mapping the import columns to the reference data set properties within the hub. Data can be imported directly via a Java API, web services interface or imported manually through the UI. It is worthwhile mentioning that DRM also offers a batch client that may be integrated with one's scheduler of choice to enable periodic batch import and export processes with connected systems. Also, DRG allows business users to upload files containing mass changes (e.g., implement whole reorganizations), using a governed change approval workflow. Power users (e.g., data stewards) may also use a simple scripting mechanism referred to as 'action scripts' to perform mass updates into DRM.

8. Versioning Support — The notion of "time travel" or "temporal RDM" relates to the ability to traverse forward or backwards in time ("effective dates", etc.) in support of recreating reference data tables and the hierarchies that manage the reference data relationships. Oracle DRM supports versioning of reference data sets and related mappings. Such versioning is used in conjunction with lifecycle management to manage changes to the reference data sets and mappings over time. This versioning support manages the lifecycle of a canonical set, the lifecycle of application-specific or local sets mapped to the canonical, and the lifecycle of the mappings themselves.

DRM also supports the notion of "temporal" reference data across hierarchies and relationships. As an example, an analytical system needs to have access to current and prior historical versions of reference data in order to support trending and comparison reporting. Without consistent definitions (or translations), business analytics will be like "comparing apples to oranges". Access to future dated reference data versions (e.g., "effective date" or "as of" dating for mergers or sales territory reorganizations) can be useful for impact analysis modeling. In addition, DRM supports "cross-temporal" relationships/mappings that exist between different versions of the same reference data. This is commonly seen in classification standards such as North American Industrial Classification System (NAICS) or International Classification of Diseases (ICD). Codes in prior

editions may have many-to-one, or one-to-many relationships with later editions. For example, in NAICS 2007 two codes exist for soy bean and oil seed processing. These codes were consolidated into one code for the 2012 version of NAICS. Therefore the single code in NAICS 2012 has a one-to-many relationship with codes in NAICS 2007. Because Oracle DRM offers support for any hierarchy (taxonomy) model, it can manage D&B codes/hierarchies (corporate/enterprise family trees), the ACORD reference data sets (ACORD Business Glossary) or PPDM data model for energy industry (well management, plant and refinery safety management industry standard definitions).

DRM also provides RDM modeling of business rules and constraints (on values and relationships) to maintain referential integrity between master data domains as well as versions (past, present and future).

9. Security and Access Control — Oracle DRM provides robust and secure data sharing via role-based access control and a fine grain data hierarchy-centric security model. CRUD access to a particular entity is controlled by the user's role, the groups that the user is a member of, and those groups' data access privileges associated with the underlying business taxonomy. The solution supports native or external authentication, single sign-on and supports external directories including LDAP and Microsoft Active Directory.

10. E2E Lifecycle Management — The Data Relationship Governance (DRG) data governance facility for DRM includes UI and workflow processes to support formal governance of reference data, thus putting end-to-end lifecycle management of enterprise reference data in the hands of business users — reducing the burden on IT, and improving the overall quality of data used across the organization. This change management process is controlled through a configurable lifecycle management facility that is used by the data stewards to control versions of reference data sets and mappings that are in use. Every reference data set and mapping has a state that corresponds to its current state in the lifecycle (e.g., draft, approved, retired). The DRM solution supports lifecycle management such that lifecycle states and transitions are configurable without requiring development, enabling the formal governance processes to keep up with a company's changing governance requirements.

Organizations looking to deploy a data governance workflow system with Oracle DRM have two options on how to handle the workflow integration:

- Utilize Oracle's Data Relationship Governance (DRG) add-on module for DRM which utilizes Oracle's embedded workflow as a configuration-driven rather than a coding-based model
- Integrate Oracle DRM via web services to a third party workflow tool such as Lombardi, MS SharePoint, PegaSystems, Savvion and Semantic

Although DRM is not considered an operational MDM hub, i.e. for use in onboarding and transacting in real-time with Customers or Suppliers, it is frequently used as an MDM hub for non-inventorial assets. For example, information-based businesses that do not overly rely upon physical inventory – e.g., digital products, financial services and media.

Competitive Outlook

Competition for a multi-domain RDM product such as Oracle DRM solution includes:

- Custom-built, manual solutions
- Hierarchy management system adaptations
- Custom MDM domain type
- Multi-domain RDM
- Purpose-Built or Industry-Specific RDM

Custom-Built, Manual Solutions — Many enterprises struggle with home-grown RDM using spreadsheets and other error-prone manual processes to manage to reference data sets and their relationships to each other.

Just as customer-built CRM, ERP and MDM have faded when commercial off-the-shelf solutions became widely available, so too will manual RDM solutions fall into disfavor. With custom-built or home-grown RDM solutions stewards have to rely on IT for changes to functionality and are unable to change the business rules relating to the reference data themselves. DRM often struggles to get the attention of large, well-known consulting firms for two reasons: (1) these consultancies would rather sell clients a custom RDM solution; and (2) they would rather implement more complex RDM modules that increase implementation cycles and grow billing potential. DRM is a lightweight RDM solution with a relatively small footprint that is easy to deploy and administer. It is designed with semi-technical / non-technical administrators in mind. Such consultancies should be evaluated based on their ability to architect business domain-specific solutions in addition to consumption and business process (workflow) models within DRM rather than their technical prowess to write code and build complex integration programs.

Hierarchy Management System Adaptations — Organizations can attempt to use simple hierarchy management software, but such systems do not readily support publish-subscribe, classification mapping, etc. (e.g., Microsoft Master Data Services (MDS)). Many finance departments use tools such as Microsoft MDS for financial hierarchies and attempt to apply these tools to hierarchies in human resource assets, location assets, etc. To provide rudimentary RDM-like capabilities, any organization that utilizes Microsoft MDS will also need to introduce another 3rd party RDM bolt-on such as Profisee, Riversand and Visionware. This approach has not proven enterprise-scalable in our experience and introduces multi-vendor complexities. Because DRM is a multi-domain RDM, it is possible for it to handle both hierarchies for Finance departments and other domains.

Custom MDM Domain Type — Both Informatica (Informatica MDM) and SAP (SAP Master Data Governance CUSTOMER object) offer the capability for custom domains to be created and managed to implement reference data management. Reports from organizations that have gone this route indicate that it is not as easy to implement RDM as a custom domain type as these vendors promote. In multi-domain MDM solutions originally designed for managing customer data (e.g. IBM MDM Server and Informatica MDM), organizations report lack of data modeling flexibility, rudimentary lifecycle management capabilities and limited data governance features, in particular around authoring, workflow and cross-temporal relationship management. Additionally, such solutions (IBM, INFA) are not as good at working with subject areas that reside at the intersection of multiple domains (RDM often involves working with multi-dimensional constructs, code blocks, mappings, etc.), all areas where DRM excels. Furthermore, SAP's MDG approach to domain customization is only appropriate for those very large organizations that have the in-house SAP expertise necessary to custom code such hierarchy management and related RDM capabilities.

Multi-Domain RDM — Certain of the commercially available MDM products were architected with semantic layers on relational DBMS which provided flexibility in defining and managing multiple domain types (hence the name "multi-domain" or "multi-entity" MDM). While these products provide good flexibility and ease of use, the market feedback is that certain of these systems incur substantial processing overhead when attempting to scale into a large-scale enterprise solution. As an architectural/performance tuning option, certain of these RDM solutions offer the ability to run parts or all of the RDM/MDM platform on a standard relational DBMS platform.

Approaches to data governance of reference data vary among the multi-domain RDM offerings— ranging from the “do-it-yourself approach” (tool kit with additional integration required to data quality and related facilities) vs. systematic data governance operating model including a scalable information model that is coupled with support for configuring complex business rules (without coding), and data-driven orchestration of processes to automate change management and data remediation.

- Governance *across* enterprise applications use of reference data such as ERP, HR, Financials and Enterprise Performance Management (EPM) is critical and an area where Oracle DRM excels via the delivery of off-the-shelf integrations among such systems (and at no additional cost).

- Clearly, business rules in the Finance world tend to be complex and increasingly require mature and powerful capabilities for such governance.
- Management of hierarchies and the relationships across reference code tables is critical and needs more than visual scrutiny but rather an E2E systemic approach based on structural comparison of hierarchies, their attribute similarities/differences, etc.

Purpose-Built or Industry-Specific RDM — Certain enterprises have used SAP's PIM solution as a consolidation type of RDM support. For example, consider SAP's "item master" with its staging areas and mini model for landing reference data which also includes simple workflows. There are also purpose-built RDM solutions which leverage the hierarchy management capabilities of a mainstream MDM platform such as IBM MDM Server and Kingland Systems' Security Master. Other organizations have attempted to manage look-up tables such as RDM data via an existing AssetControl, Eagle or GoldenSource real-time RDM by simplifying what features are used. The challenge in this scenario is that many times these premium priced real-time RDM solutions do not make good economic sense.

Competitive Differentiation

A key aspect of any reference data solution is the requirement for "integrated data governance". Much of the industry discussions around data governance focus solely on the notion of "data stewards" endeavoring to collaborate via Councils and Committees. Oracle DRM's approach to "Enterprise Data Governance" viewpoint is to enable "contextual data-driven workflows" to drive change management -- not just among Data Stewards and Subject Matter Experts but across and within organizational structures. For example, "outside/in" changes also need to be supported as people on the "edges" of the organization also are many times in the best position to communicate changes because as they are closest to them. Clearly, front-line business users need to be the authoritative sources of change while all parties concerned will need collaborative workflows to provide agreement, enrichment and associative enhancement.

Enterprise Data Governance provides the ability to have changes begin with front-line business users and reconcile these changes across all the information silos –front office, back office, and performance management office (e.g. Business Intelligence and Enterprise Performance Management (EPM) groups). Clearly, data governance for master data is moving beyond simple stewardship towards the convergence of task management, workflow, policy management and enforcement. In addition, an agile data governance solution needs to deliver its change management and governance capabilities - delivered through context sensitive and data-driven workflows that promote agility, can change with the business, and provide adequate controls to ensure effective inter-departmental collaboration and trustworthy information assets.

Futures for Oracle DRM as an RDM Solution

It is our view that DRM will continue to have success in large enterprises, within the finance department, in business analytics, as well as in other operational areas including the front office, while continuing its momentum in the Oracle Hyperion EPM-centric organizations. DRM is also well positioned to address small-to-medium sized businesses (e.g., US\$500M to US\$1BM revenues) and in departments of very large enterprises (for example, RDM for finance/accounting, RDM for human resources). Some of the key areas we believe Oracle DRM should focus on include: change reporting and governance analytics, adding enterprise content management (ECM) support for unstructured information, and offering a subscription hosted model (SaaS or Cloud-based).

One of the key distinctions between the DRM approach to master data and the other MDM hubs in the market (including Oracle's own Customer Hub and Product Hub) is that the other Oracle MDM products have an overbearing reliance on an underlying operational data model. This in contrast to DRM, where the more modern

“graph” data model and “in-memory” database approach is applied to provide additional flexibility of being able to model what is not in the ERP (without using FLEXFIELDS and other artifacts).

In the future, there should be more functionality in supporting broader scope operational MDM use cases such as B2C customer identity resolution. Organizations also are increasingly asking for graph-style data visualization of the RDM relationships (this applies to all MDM vendor solutions). Another area is additional integration with reference data consuming enterprise applications (beyond current API-level integration with Oracle, SAP, SFDC and Work Day applications).


BOTTOM LINE

For the global 5000 enterprise -- and increasingly the small-to-midsized business -- approaching Reference Data Management, Oracle DRM can provide lower TCO relative to the alternative ad hoc/DIY RDM based on multi-domain MDM. A key differentiating feature is the governance of hierarchies and master reference data sets in DRM that enables creation of business user-driven information and process models. This model-driven architecture means DRM generates the required authoring screens, workflows and integration points directly from the data model with minimal IT assistance.

Coming to market during 2015-16 are RDM solutions characterized by multiple, diverse levels of integration with market-dominant operational MDM hubs (IBM, Informatica, Oracle, SAP) as well as repackagings of existing mid-market MDM and data governance capabilities to address RDM business needs (e.g., Ataccama, Colibra, Orchestra Networks). Oracle DRM is in the vanguard of such data governance-enabled products and is an excellent choice for RDM in enterprises ranging from SMB to Global 5000 size. Clearly, the Oracle DRM solution has certain advantages in that it is architected (and proven) to support both business user-driven management, stewardship, and distribution of reference data within the enterprise.

For the intersection of: (a) the governance of enterprise RDM code sets, (b) business intelligence dimensionality, (c) workflows and dynamic business rules, we believe Oracle DRM is one of the strongest RDM solutions on the market.

See you at the next annual MDM & Data Governance Summit in your hemisphere where we will be hosting panels on "Best Practices in RDM" as well as providing industry-specific case studies and more on reference data management.



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- [MDM & Data Governance Summit Singapore 2015](#) – Marina Bay Sands Resort – Singapore • November 2015
- [MDM & Data Governance Summit Europe 2016](#) – Radisson Portman BLU – London • May 16-19, 2016 (note = 4 days)

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The MDM Institute is the world's leading research and advisory consultancy exclusively focused on master data management. As chief research officer, Aaron Zornes delivers the technology-related insight necessary for its clients to make the right decisions in their use of master data management (MDM), customer data integration (CDI), reference data management (RDM) and data governance solutions to achieve their customer-centric business goals. The MDM Institute provides authoritative, independent and relevant consulting advice to senior IT leaders in corporations and government agencies, to business leaders in high-tech enterprises and professional services firms, and to technology investors. The MDM Institute delivers its research and advice to more than 60,000 clients in 10,500 distinct enterprises via Twitter, Linked In, Xing, Google+ and email newsletters. Additionally, each year more than 2,000 paid delegates attend its MDM & Data Governance Summit conference series held in London, New York City, San Francisco, Singapore, Sydney, Tokyo and Toronto (now in its seventh year). Founded in 2004, the MDM Institute is headquartered in San Francisco and has clients primarily in North America, Europe and Asia-Pacific. For more information, visit <http://www.the-mdm-institute.com>.

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