Building a Blueprint for Better Decision Making

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Executive Summary

Many organizations struggle with trying to match their business needs to their technical capabilities. The language that enables business needs to be matched to technical capabilities is data. And the better you manage and leverage data about your assets, the better you manage and leverage the assets.

For most organizations, data about customers, operations, financials, products, inventory, and employees are vital to running the business. To be competitive and provide the services and products that keep your business running, you need a single, consistent view of your data. This single view of data gives you a consistent view of your business so that you can see how all elements of your business relate to one another. To help you get this view, you need a business-unified data model. This type of model describes an entire organization at a logical level, and therefore can be a very effective starting point for many application efforts, saving substantial design time and increasing terminology consistency within an organization.

If you are a data modeler, data owner, data governor, data warehouse manager, or business analyst, this whitepaper will help you understand the value of a business-unified data model and Teradata Corporation's Unified Data Model Framework. Due to the large investment to create a business-unified data model, many organizations start with Teradata® industry data models (iDMs), which require minimal customization as long as an organization fits within an industry. Rarely however can organizations be defined accurately by traditional labels. That's particularly true in the current economy as many branch out to perform functions that cross traditional industry and market boundaries. For example, a manufacturer may also be a retailer. However, the iDMs now fit together within the Teradata Unified Data Model Framework, allowing an organization to start with a particular iDM and then enhance their iDM with features from other iDMs to make the whole process of mapping the data a lot easier and cheaper than starting from scratch.

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Data Models are Maps that Describe an Information Landscape

You are planning a trip to a city that you have never been to. Your plan is to go sightseeing, but you've never been to this city, and you don't know all the sights to see. You need a map—a map that shows you where the different attractions are located in the city and how to get there. Planning a trip and using a map to make decisions about what you will see and how to get there is similar to having a map to help you understand what your information assets are and where they are located.

Data models are essentially maps that help you navigate the information landscape.

Data models are critical in helping companies understand their data and how that data gets leveraged in their organization for analytics and decision-making. Trying to navigate your data requirements without a data model is like trying to navigate a city that you have never been to without a map.

A data model can describe an organization's information at various levels of detail. At times a high-level map is most effective and is called a conceptual data model. At other times a very detailed map is required, which can be at a logical or physical level of detail. A logical data model (LDM) is a map showing the data elements and business rules on how information is used within an organization, independent of technology. The physical data model (PDM) is the LDM adapted to a particular database technology. Because there are lots of different technologies, often one LDM can be the seed and integration point for multiple physical data models.

The Business-Unified Data Model Maps an Entire Organization

The landscape that both a map and data model describe is defined by a particular scope. For example, a map can describe New York City, New York State, the United States, or the world. A data model can describe order entry, sales reporting, a data warehouse, or also the "world." The data model which describes the world (that is, everything within an organization) is a business-unified data model. A business-unified data model is subject-oriented and contains all of the data produced and consumed across an entire organization. Business-unified means that the concepts in a data model fit together as the CEO sees the company, as opposed to how individual functional or department heads see 'their view' of the company. This not only means how the CEO sees the company, but how he or she sees the entire business in the context of the entire value chain in which it competes.

In a business-unified data model, there is one Customer entity, one Order entity, and so on. Integration goes hand-in-hand with this subject orientation integration means that all of the data and rules in an organization are depicted once and fit together seamlessly. Every data element has a single definition and name integration implies that with this single version of the truth comes a mapping back to the chaotic real world.

For example, if Customer Last Name lives in 10 applications within an organization, the integrated view would show Customer Last Name only once and in addition capture the mapping back to these 10 applications the most value at a logical level, because it can seed the initial LDM for a broad spectrum of applications across the enterprise. Application teams can start with a portion of the business-unified LDM and eventually, each team constructs a physical data model for their application based upon this logical integrated data model. Starting with an existing data model saves application teams an incredible amount of time building one from scratch and increases reuse and consistency within the organization. A business-unified data model, therefore, is an essential part of business-unified architecture.

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The Business-Unified Data Model Starts with a Teradata Industry Data Model

Business-unified iDMs are extremely useful for large program-wide initiatives such as data warehousing. Business-unified iDMs start with a Teradata industry data model (iDM). An iDM is a pre-built logical/physical data model for a particular industry. Industry data models currently cover these industries: communications, finance (banking and insurance), healthcare, manufacturing, media and entertainment, retail, transportation and logistics, travel and hospitality, utilities, life science, and health and human services.

An industry data model reflects the way the industry does or will do business. It is a subject-oriented and integrated view of all of the information needed for an integrated data warehouse to answer both strategic and tactical business questions. As an LDM/PDM, it is application-independent. This means software, hardware, and communications constraints are not present in the model. All model changes that will be needed for speed, storage, security, backup and recovery, and the like, need to be added at the physical level. However, a majority of the structures in the logical do translate nicely into an efficient physical design.

Top 10 Benefits of Data Models

1. Provide agile teams with a solid foundation.

Agile frameworks, such as Scrum and Lean, are practiced with the goal of producing working software in a minimal amount of time. Often however, short-term gains come with the price of long-term support. Agile teams at times produce useful project-oriented software that may not follow standards, good design principles, and enterprise architecture. Starting with a Teradata industry data model can dramatically reduce the amount of time necessary to build a consistent and well-structured enterprise model to support agile teams.

2. Link with Teradata Data Integration Roadmap (DIR).

Many organizations obtain the iDM simply because of its connection with the Data Integration Roadmap (DIR), also known as the Data Integration Roadmap (DIR). The DIR is a business planning tool containing industry-specific business questions and key performance indicators (KPIs), and can be expanded to include company-specific business questions and KPIs.

These questions and KPIs are often enterprise level cross-functional requirements that are required as a prerequisite to answering an integrated environment. However, by providing built-in mappings to the corresponding iDM, much of the mapping that is required to answer these questions and deliver KPIs is already in place. This can bring your business intelligence solution up to the next level and add substantial business value.

3. Capture operational view, and therefore, is integration friendly.

The operational view represents how an organization works as opposed to how an organization does reporting. Because an organization follows standard business processes, any applications that automate these business processes should map to the iDM with much less effort than if a reporting perspective is modeled. In addition, the model takes advantage of generic structures, such as Party and Event, to ease the mapping effort. Ben Givens, American Airlines Enterprise Data Architect, summarizes this integration benefit: "The Teradata Travel Data Model provided a foundation of modeling patterns that guided our integration efforts to bring together multiple disparate databases. This foundation was our target business model that synchronized development teams by providing a common language for the travel business domain that was instrumental in building an integrated data warehouse."

4. Minimize risk.

When a data model is built from scratch, we sometimes question whether we have everything that is needed somewhere in the model. What would be the impact if a concept is accidently left off the model or not represented properly? The costs could be in terms of money or litigation or business credibility. A large semiconductor company uses the Teradata Manufacturing Data Model for mainly this reason. Modelers at this company refer to the model to make sure there are no gaps in their own models, thereby minimizing the risk that something will be left out. The iDMs have been built by modelers who have worked many years in their respective industries, and therefore, the models present a trusted view.

5. Facilitate information sharing.

If your business needs to exchange data with other companies within the same industry, an iDM can be very valuable to establish a common language and set of rules. If two organizations need to share data, and they use the same terms and rules, it will make sharing much easier and less error-prone.

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6. Reduce maintenance costs.

When a new industry concept is introduced, Teradata includes this new conception the next release of the model, and therefore, there is no maintenance cost to model the new concept from scratch. For example, when RFID was introduced, the Manufacturing iDM was updated by Teradata and distributed to all customers.

7. Extend gracefully to accommodate new concepts.

The iDMs make use of abstraction when necessary—abstraction is combining like things together under generic terms, such as Event and Party, to facilitate integration and to gracefully handle future requirements. The iDM can easily accommodate a new type of Event for example, as well as connect with other iDMs that also use the Event concept. This allows for greater commonality within and across the iDMs. All industries have Events for example, whether they are campaign solicitations in the banking industry, emails to change a shipment date in the manufacturing industry, or service disruptions in the communications industry.

## 8. Provide global and standard perspective.

The structures in the iDMs are designed for international use, not just U.S. based. For example, the term 'postal code' is chosen over 'ZIP code'. In addition, the data elements in each iDM follow best practice naming standards, including the use of class-words based on the ISO 11179 metadata standard. A class-word is the last part of a data element name that represents the high-level category in which the data element belongs. Examples of class-words are name, code, identifier, date, quantity, and amount. So the class-word for Customer Last Name is "name."

9. Present the concepts in digestible chunks.

The iDM is sectioned into subject areas. Subjects are neatly captured in separate views, and the use of color distinguishing each subject area makes it easier to digest the larger models.

10. Fit together with other iDMs to create the Teradata Unified Data Model Framework.

Allows organizations the option to select the iDM that most closely represents their business and then enhance with components from other iDMs to create a more representative picture of an organization. Read more about this in the next section. (See Figure 1.)

Figure 1. Unified Data Architecture.
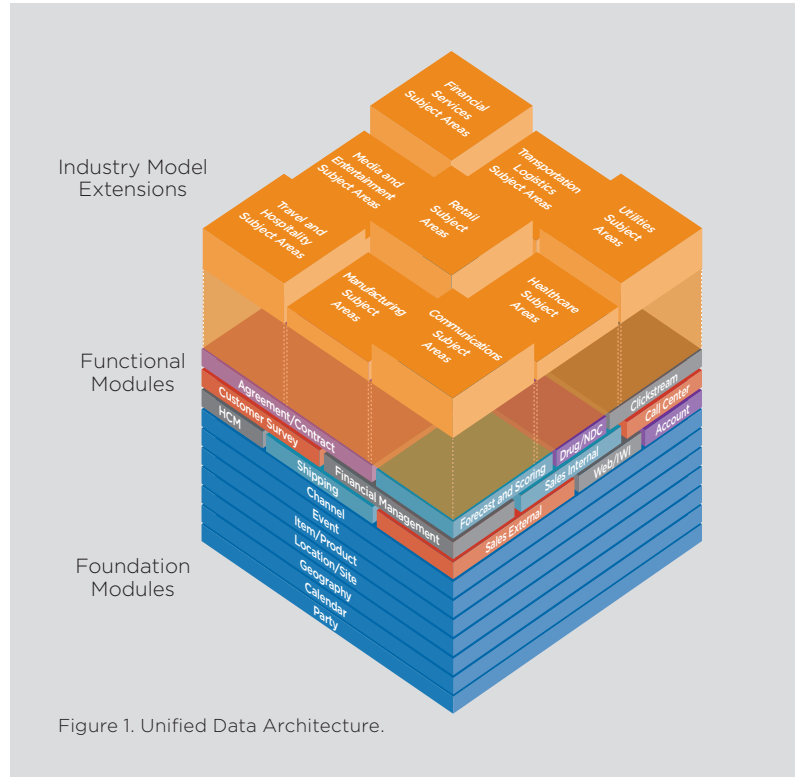
Teradata Unified Data Model Framework = iDM + Modules + Features from other iDMs

Rarely can organizations be defined accurately by traditional labels. That's particularly true in the current economy as many branch out to perform functions that cross traditional industry and market boundaries. More and more, companies simply don't fit any specific mold:

- Manufacturers may also be retailers
- Airlines broker rental cars
- Phone companies sell cable TV and Internet services

Therefore even when they know the benefits, diversified companies often say they can't find a single suitable industry model that works best for them. Fortunately, it's now possible to build a unified data model to see beyond the enterprise view to the holistic value network of an organization.

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Companies typically choose an iDM that is tailored for their industry. But to be at all useful, the model needs to accommodate changes such as expansion into different markets. That might require two or more iDMs that must be either integrated or heavily customized. A better method is to select one primary iDM and then add the relevant common components from other industries to create a unique model. This method of unification captures the best practices of industries and creates a plug-and-play environment that employs elements of the separate iDMs as modules for others. Consequently, the models reflect real-world applications while providing a single view of the operation to support growing business plans.

Imagine a large retailer that also owns fleets of trucks that deliver goods from its distribution centers to the stores. A retailer like this not only has a need for an industry data model that highlights data requirements around retail such as customers, product, store, inventory, assortments, and promotions, but it also needs features from a transportation model that can help manage its fleet and look at things such as logistics and shipping. In this situation, this retailer's unified data model includes the retail iDM, features from the Transportation iDM (e.g., Shipping), plus the Maintenance, Repair, Operation (MRO) module, which is a cross-industry module. (See Figure 2.)
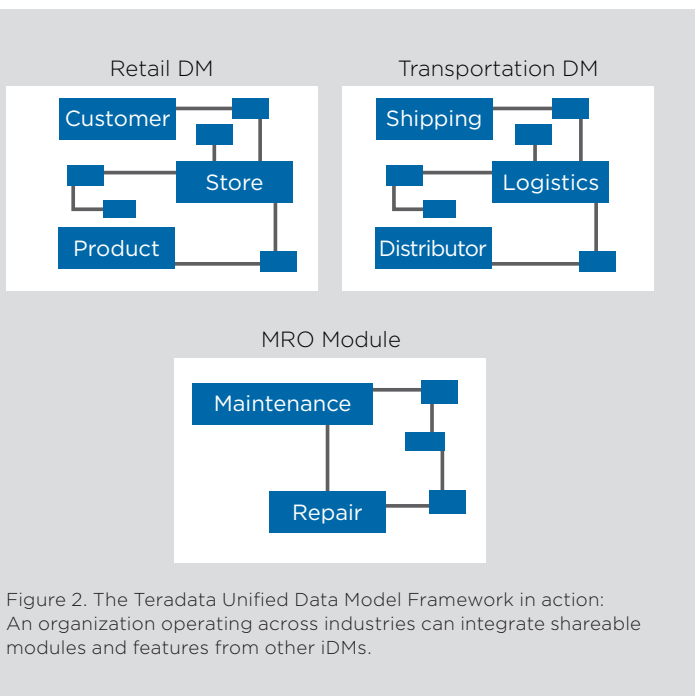

Figure 2. The Teradata Unified Data Model Framework in action: An organization operating across industries can integrate shareable modules and features from other iDMs.

Roughly 45% of current industry models are candidates for unification. By leveraging functions from other industry DMs, an organization can select one industry DM to represent its primary business focus, while integrating content from other iDMs to incorporate cross-industry content.

The benefits of the Teradata Unified Data Model Framework include:

Quick Availability of Modules
In addition to Teradata standard releases, modules can be made available whenever a module is added or enhanced.

Speed to Solution
By adding the necessary cross-industry or industry-specific features to an existing iDM, organizations need less model customization to fit a particular implementation and therefore can more quickly get return on investment.

Greater Applicability
As organizations continue to morph and expand across industries, iDMs can adapt to and accommodate their needs.

Teradata provides companies from a variety of industries with a suite of expanded capabilities leveraging the Unified Data Model Framework. The new suite of industry Data Model products developed within this Framework allows organizations to guide data integration so that they can make smarter, faster business decisions. This gives companies the opportunity to save time by receiving information when they need it; save money by convenient access to cross-functional information (get an enterprise-wide view of the entire business); and maximize data structures into real-time business information (no more waiting for information that is needed to make quick adjustments). In other words, Teradata turns business agility into a reality.

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