IBM Information Management software

Accelerating data warehousing deployments with IBM Industry Data Models and IBM Information Server

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Introduction to dynamic warehousing

When it comes to information, all large enterprises share a common goal: they want to turn data into actionable business insight as quickly as possible. Unfortunately, the complexities and constant changes from growth, mergers and acquisitions, continual IT investments and maturing software solutions and services have made it problematic to deliver a single view of the business. At the same time, businesses have a critical need to leverage information across many business channels, offerings and territories in order to:

- *Identify new opportunities and bring new products to market quickly*
- *Optimize business processes with real-time information and analytics*
- *Increase visibility into business processes for regulatory compliance*

A traditional data warehouse is designed for analysis of historical data that is collected on a scheduled basis and accessed by a relatively small number of users to support strategic decisions and to track business performance over time. A traditional data warehouse is not optimized to handle more real-time data and does not include or analyze unstructured information. It also is not accessed by hundreds of users who need operational metrics and key performance indicators (KPIs) embedded in critical business processes.

Today, businesses are adopting a new approach to data warehousing called *dynamic warehousing*. This approach combines the reporting and analysis capabilities of traditional data warehouses with real-time data access to operational data and unstructured information so that critical information is delivered on demand and in context wherever it is needed.

Five steps to a dynamic warehouse: Getting through the roadblocks

At many companies, the data needed to understand customers and their operations is often spread across numerous information silos in multiple incompatible formats. This problem is not due to a shortage of data or reporting systems, but to the fact that information is not available in a consolidated, cleansed and business-ready format that clearly supports industry-specific financial, operational and compliance reporting analysis.

While getting relevant information into the hands of business users can help companies combat industry challenges, a dynamic warehouse must take into account the KPIs of the business—and the data that feeds these metrics must be of sufficient quality. Defining the right business KPIs and the data consolidation infrastructure necessary to bring the data together is a complex task beyond simple data harvesting. The lack of coherent dynamic warehousing infrastructure can quickly derail many data warehouse initiatives, hindering the ability to deliver consolidated business metrics and trusted data.

Just like the carpenter's adage of "measure twice and cut once," a thorough business definition of reporting and data requirements needs to be mapped out before any heavy lifting of data occurs. Simply put, if a business has not agreed on a common definition of profitability and how it should be measured across the business, how can the solution be expected to acquire, consolidate or deliver trusted data that conforms to this business definition?

A dynamic warehouse life cycle can be simplified into five key stages that exploit tried and tested industry best practices and technology to rapidly realize strategic value.

Step 1: Define requirements through collaboration

Driven by business users and analysts, the scope of the reporting analysis challenge is defined, including identifying the KPIs and the required data inventory. To help ensure that all interested business and IT parties are working from the same information, a glossary of terms is developed to aid in the recognition and understanding of requirements and downstream reporting structures.

Step 2: Establish a single analytical view

To support a broad spectrum of analysis across the business, the enterprise data warehouse model becomes the consolidation focal point for the data integration process. This model not only supports the harmonization of data from disparate information silos, but it also becomes the data source for downstream reporting datamarts that are accessed by business intelligence tools. To determine whether reporting analysis can be supported by the current data inventory, a thorough data profiling exercise should be carried out to establish the data cleansing, transformation and delivery requirements necessary to load the enterprise data warehouse.

Step 3: Deploy the enterprise data warehouse

Using the enterprise data warehouse implemented on the database and data integration platform of choice, data discovered during the data profiling phase is cleansed, transformed and delivered from multiple information silos into a harmonized data warehouse. The volume and velocity of data is unique to specific analytics, and the solution should be capable of managing the connectivity and scalability requirements necessary to provide a steady flow of data to the datamarts and business intelligence tools, enabling them to provide trusted data on demand.

Step 4: Disseminate the data

Once the enterprise data warehouse has been established, the downstream analytic datamarts that contain unified measures and dimensions are created and loaded with data. The update frequency of this customer-facing data is entirely dependent upon the business needs it addresses—either historical, operational or potential future scenarios. The business-centric datamarts or online analytical processing (OLAP) cubes should embody the KPIs identified in Step 1 and use the same data elements as the enterprise data warehouse. This helps minimize the amount of business intelligence development and increase reporting consistency.

Step 5: Provide analytical access

Business intelligence tools are deployed to leverage the KPIs implemented in the datamarts or OLAP cubes. The business descriptions and technical artifacts associated with the KPI and data integration design are made available to business users through the business intelligence tool and companion business glossary, which helps ensure that users have insight and understanding into the data they are relying on to drive their business.

This executive brief provides an overview of how IBM Industry Data Models and IBM® Information Server provide a powerful and flexible infrastructure that supports the five steps for creating a dynamic warehouse.

Infrastructure for dynamic warehousing: IBM Industry Data Models

A key component of any data warehouse infrastructure is the data model that specifies how information is structured and how it is accessed for analysis and reporting. Traditional data warehouses are often built upon home-grown or application-specific data models that fall short of requirements for dynamic warehousing. For example, these data models do not usually incorporate industry best practices, compliance reporting or enterprise-wide reporting perspective. These models will also often become fragmented as well as increasingly difficult to use, costly and slow to respond to changes in business requirements. This makes comparability across reporting solutions inconsistent and therefore useless for effective decision making.

The IBM Industry Data Models deliver breakthrough productivity throughout the data warehouse life cycle, helping businesses rapidly create the dynamic data warehouse. This productivity starts with the initial business requirements analysis of the right key performance metrics and extends to the consolidation and cleansing of data and the deployment of reporting OLAP cubes, datamarts and the business intelligence tool of choice. The resulting end-to-end data warehouse infrastructure can enable information to be used in new ways to drive innovation, help increase operational efficiency and help lower risk.

Gleaned from the thousands of data warehouse solutions IBM has been involved with over the last 10 years, IBM Industry Data Models and IBM Information Server help ensure that a dynamic warehouse project meets its return on investment (ROI) goals in a timely fashion by:

- *Defining the measures that support key business processes—collaboratively with business and IT staff*
- *Demonstrating quick proof of value through an incremental approach and industry best practices*
- *Streamlining and automating the data investigation, consolidation and cleansing process*
- *Leveraging operational master data and business metadata to enhance data clarity*
- *Focusing on standardization—common measures, models and infrastructure across the enterprise*
- *Providing best practice support to establish data governance through "centers of excellence"*

Hurwitz & Associates customer survey[1] of clients using IBM Industry Data Models

- Companies spend between 30 to 40 percent less time during the modeling phase.
- These companies discovered a 20 to 25 percent decrease in the time spent in the design phase.
- Companies identified a 15 percent decrease in the time spent in the deployment phase.
- When building a data warehouse using the IBM Industry Data Models, companies were able to identify overall cost savings between 10 to 15 percent.

Dynamic data warehouse infrastructure built on best practices

A data warehouse built using IBM Industry Data Models encapsulates extensive best practices in delivering effective data warehouse solutions to some of the world's leading institutions. Tailored to address the specific needs of an industry, the integrated, interlinked and customizable IBM Industry Data Models represent thousands of person hours of IBM experience in delivering hundreds of data warehouse solutions for organizations of all sizes around the world. The platform-independent banking, insurance, financial markets, retail, telecommunications and healthcare data models each contain thousands of hours of development effort and expertise to help business users and IT staff implement business-ready analysis templates (business solution templates) and an enterprise data warehouse on time and on budget.

Components of the IBM Industry Data Models include:

Industry business terminology data model. The industry business terminology data model (conceptual model) is a list of business concepts used to gain agreement across all aspects of business and IT on how a company defines itself and its measurements for success—such as profitability, cost center or customers. This information is organized into a customizable nine-element hierarchy of business terms and definitions that are directly linked to other areas of the data model, including the KPIs and the underlying data definitions found in the enterprise data warehouse. Designed to accelerate the model development process, the industry business terminology data model helps maximize the value of your existing information by enabling business and IT to speak the same language during requirements definitions and implementation phases of the project.

Industry business solution templates. Industry business solution templates (requirements model) are a collection of business-centric KPIs that make up an enterprise's consolidated business reporting metrics. The templates represent industry, financial, risk and compliance reporting best practices. For example, the Relationship Market focus in the Banking Data Warehouse model contains multiple business solution templates (BSTs) including Lead Analysis, which consists of measures including customer life time value and dimensions such

as campaign type and competitive win status (see Figure 1.) These templates are not only used to help business managers quickly identify the scope of and customize their analytical reporting requirements, but are also used by IT to implement the datamarts and OLAP cubes that dashboard, scorecard or ad hoc reporting tools use to gain business insight.

Figure 1: Each IBM Industry Data Model includes business solution templates specific to that industry

IBM Information Server and IBM Industry Data Models

Banking
(Banking data warehouse)

- Profitability
- Relationship marketing
- Risk management
- Asset and liability management
- Compliance

Financial markets
(Financial markets data warehouse)

- Risk management
- Asset and liability management
- Compliance

Health plan
(Health plan data warehouse)

- Claims
- Medical management
- Provider and network
- Sales, marketing and membership
- Financials

Insurance
(Insurance information warehouse)

- Customer centricity
- Claims
- Intermediary performance
- Compliance
- Risk management

Retail
(Retail data warehouse)

- Customer centricity
- Merchandising management
- Store operations and product management
- Supply chain management
- Compliance

Telco
(Telecommunications data warehouse)

- Churn management
- Relationship management and segmentation
- Sales and marketing
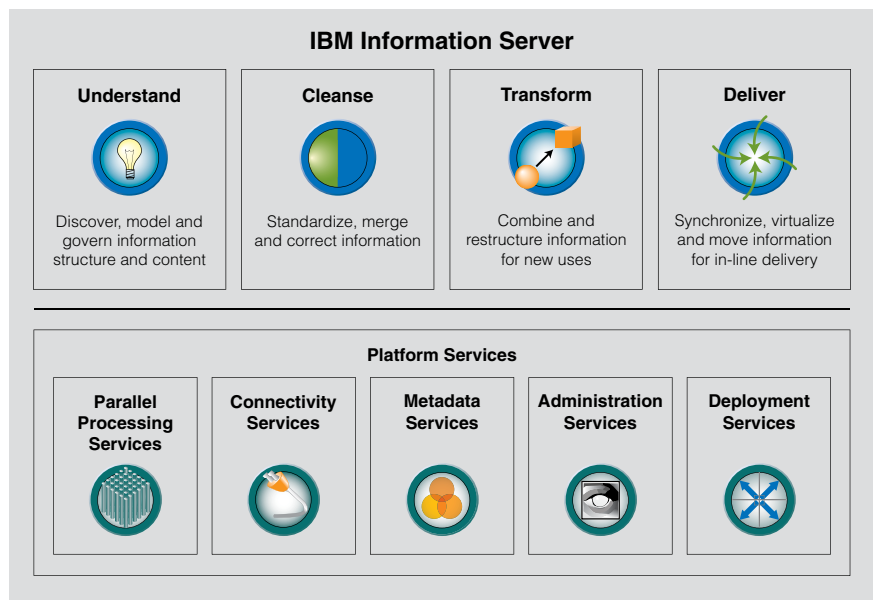- Service quality and product lifecycle
- Usage profile

Industry enterprise data warehouse model. The enterprise data warehouse model (design model) defines a single analytical view or single data repository, helping to ensure that the business solution templates are populated with appropriate trusted data. Each IBM Industry Data Model portfolio contains an enterprise data warehouse model designed to help consolidate data from throughout the enterprise into a single comprehensive view. Independent of any particular account, product, organization or channel hierarchy, the enterprise data warehouse model comprises more than 80 percent of the data structures typically needed by an organization. The enterprise data warehouse model can then be transformed into a physical data warehouse database once it has been customized to meet the exact requirements of the business.

Infrastructure for dynamic warehousing: IBM Information Server

IBM Industry Data Models work seamlessly with IBM Information Server to provide a complete infrastructure for dynamic warehousing. Built on a unified platform and working in concert with revolutionary data integration methodology, IBM Information Server helps organizations derive more value from complex, heterogeneous information spread across their systems.

IBM Information Server acts as a buffer between all of the operational systems that provide source data and the enterprise data warehouse and datamarts. It includes integration services for data discovery, transformation and cleansing that help ensure the right data is identified, aligned and delivered as needed to the data warehouse model, business intelligence applications or business processes (see Figure 2). IBM Industry Data Models and IBM Information Server share business metadata to deliver a coherent and optimized approach to managing sources and targets for the data warehouse.

Figure 2: IBM Information Server provides a metadata-driven approach to enterprise data integration

IBM Information Server

Understand	Cleanse	Transform	Deliver
Discover, model and govern information structure and content	Standardize, merge and correct information	Combine and restructure information for new uses	Synchronize, virtualize and move information for in-line delivery

Platform Services

Parallel Processing Services	Connectivity Services	Metadata Services	Administration Services	Deployment Services

The components of IBM Information Server include:

IBM WebSphere® Business Glossary provides context to information technology assets, allowing business and technical users to share a common understanding of information assets. IBM Information Server puts business users in control of business metadata by providing them with an easy-to-use, Web-based interface that enables authoring, management and sharing of critical business metadata. WebSphere Business Glossary may be fed information from the IBM Industry Data Model.

IBM WebSphere Information Analyzer provides data profiling and monitoring capabilities to help companies quickly and easily understand source data. These insights can help accelerate information-based projects, from data warehousing and infrastructure consolidation to master data management and data governance. WebSphere Information Analyzer also takes information from the IBM Industry Data Models to help ensure that data profiling and discovery efforts are aligned with business requirements.

IBM WebSphere QualityStage helps ensure that strategic enterprise systems deliver accurate, complete information that business users can trust. As the data warehouse becomes more dynamic and more closely tied to business processes, every piece of information must be cleansed and aligned to provide data that is accurate and complete. WebSphere QualityStage discovers relationships among data elements in enterprise and Internet environments, and in batch and real time. This powerful matching and data cleansing is designed for the requirements of extended enterprises.

IBM WebSphere DataStage addresses enterprise data transformation and data delivery from source systems to the dynamic data warehouse. It helps to ensure that the data is reliable, relevant and readily available in a consistent, consolidated form wherever and whenever it is needed.

IBM WebSphere Federation Server provides virtualized federation integration of heterogeneous data sources. This enables applications to access and integrate diverse data and content sources as if they were a single resource—regardless of where the information resides—while retaining the autonomy and integrity of the data and content sources. When physical information integration is not an option or requirement, the dynamic warehouse is extended with virtual integration.

IBM Rational® Data Architect and Enterprise Model Extender are two more pieces of the dynamic warehousing infrastructure puzzle. Rational Data Architect is an enterprise data modeling and integration design tool that simplifies data modeling and integration design, enabling architects to discover, model, visualize and relate diverse and distributed data assets. Rational Data Architect has now been extended with the introduction of the Enterprise Model Extender (EME). The purpose of EME is to provide support for the management of enterprise models in order to successfully deploy and govern data warehouse projects that are using IBM Industry Data Models.

Figure 3: Rational Data Architect with EME and IBM Banking Data Warehouse Model
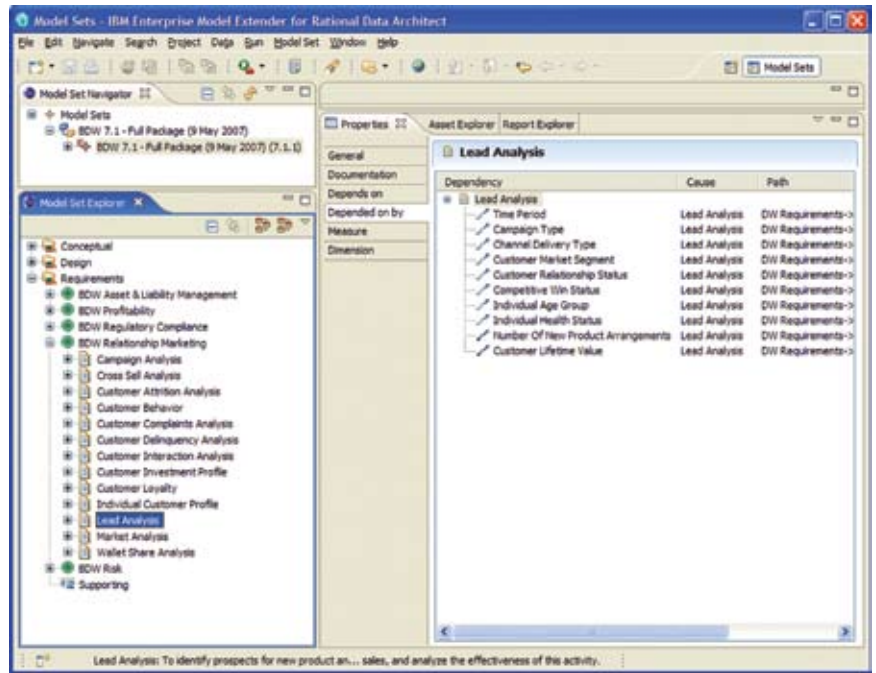
EME augments the functionality of Rational Data Architect (see Figure 3) with several specific features of the Industry Data Models:

- ***Scoping:*** *Define subsets of interest from an Industry Data Model*
- ***Repository extraction and reconciliation:*** *Extract a full or scoped model from a repository into a Rational Data Architect project to allow Industry Data Model manipulation*

- *Model management:* Compare and merge models as well as search across Industry Data Model sets
- *Requirements user interface:* Create, view and navigate requirements as required by the Industry Data Models
- *Impact analysis:* Evaluate the impact of change on dependent Industry Data Models
- *Summary generation:* Generate physical representations based on Rational Data Architect transformations from logical to physical models

EME fully integrates the requested capabilities for enterprise management of data models with the capabilities of the data modeling tool (Rational Data Architect) through the Eclipse platform. It also integrates with IBM Information Server through its IBM WebSphere Metadata Server unified metadata architecture.

IBM delivers a solid foundation for accurate, on demand business reporting

Although the upfront investment can be considerable, the right data warehouse infrastructure for dynamic warehousing will enable the data warehouse team to accurately scope business requirements, consolidate and cleanse analytical data in real time, dynamically scale the solution based on business needs and deliver key business performance results to many applications and users.

IBM Industry Data Models and IBM Information Server in action

- A telecommunications firm in Europe used the IBM Telecommunications Data Model to establish a data warehouse focused on customer knowledge, customer relationship management, international service, finance and products. A common customer and product view across lines of business and merged subsidiaries provides vital analysis to 1,000 employees and hundreds of business customers.

- A nascent Chinese automobile insurance company wanted to quickly emerge as the leader in the fledgling Chinese automobile market. It found that by leveraging industry best practices and insurance data models from American colleagues, it could achieve first-mover advantage.

- When European banking regulators suddenly changed governance rules, a banking leader needed to leverage technology that would help it change its environment so that new data governance requirements based on the best practices–based banking data models would be in place at the right time to help the company avoid fines.

- An insurance company IT executive reported that he was able to provide the business what it needed—an enterprise-wide analytical view of all products sold to an individual customer across business lines. Prior to implementing the data models, the company could not tie information together at an account level to perform this kind of analysis.

- A specialty retailer used the retail data models to deliver a single analytical view that enabled management to measure key financial reporting metrics, including profitability. The scope of the data model coverage included sales and merchandizing across two major brands, 1,500 stores and millions of daily transactions.

IBM delivers this new, more flexible infrastructure for dynamic warehousing by combining the IBM Industry Data Models with IBM Information Server. Together, these two products provide a foundation for dynamic warehousing that:

- *Helps minimize the time required to identify business requirements for the data warehouse*
- *Leverages best practices specific to your industry to implement the warehouse data model*
- *Provides understanding and monitoring of the structure and content of source systems*
- *Enables matching, cleansing and standardizing data across multiple systems in real time*
- *Transforms and delivers data to the warehouse regardless of the volume or latency*
- *Delivers real-time access to operational data using the same matching and transformation rules*

Compelling value—IBM Information Server and IBM Industry Data Models

- Delivers competitive advantage by enabling data consolidation across multiple channels and products using a single industry-proven data model
- Supports rapid implementation of reporting solutions with meaningful business metrics and statutory reporting requirements based on trusted data without the need for external development
- Facilitates a structured and incremental approach to subsequent customization and extension of the data warehouse while leveraging business descriptions and concepts
- Enables business users to more effectively control and reduce the time required to identify business requirements by providing more than 80 percent of these requirements out of the box
- Provides a solid base for relationship and marketing effectiveness, decision support and statutory reporting requirements such as the Sarbanes-Oxley Act, Basel II, International Accounting Standards Board Standard 39 and Solvency II
- More than 400 clients, seven of the top 10 insurance companies and the top three banks around the world use the IBM Industry Data Models in various facets of their business-driven IT strategies

IBM®

For more information

To learn more about IBM Information Server and IBM Industry Data Models, contact your IBM marketing representative or IBM Business Partner, or visit **ibm.com**/software/data/integration

To learn more about information integration and specific data model offerings, visit **ibm.com**/software/data/integration/library.html

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