

Delivering information you can trust  
Executive brief



IBM **Information Management** software

## Infrastructure for Dynamic Warehousing: IBM Industry Models



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## **Introduction to IBM Dynamic Warehousing**

When it comes to information, all large enterprises share a common goal: They want to turn data into actionable business insight. 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 to help:

- *Identify new opportunities and bring new products and services to market sooner*
- *Optimize business processes by embedding information and analytics as part of current workflows*
- *Increase visibility into how data flows through the organization for compliance reporting*

Although the investment can be considerable, delivering the right data warehouse infrastructure can better support business innovation, differentiation and compliance. Requirements today demand a more flexible, dynamic and scalable approach to data warehouse solutions when embarking on a consolidated, enterprise-wide data warehouse strategy. Numerous challenges must be addressed and overcome—such as accurately scoping the business requirements, consolidating and cleansing analytical data in real time, dynamically scaling solutions based on the needs of the business and delivering key business performance results reliably with trusted data. The goal of a dynamic warehouse is to deliver information on demand to people and

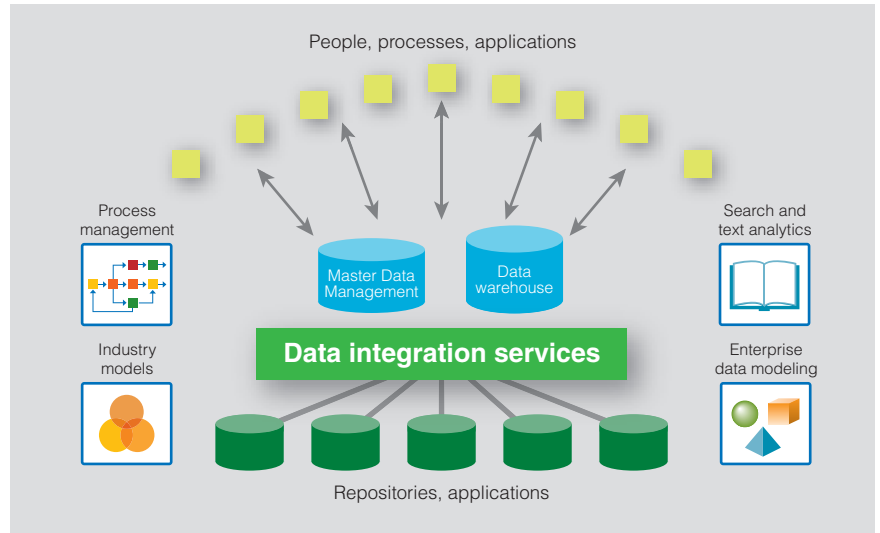
processes, which can help to dramatically shorten the lag between events and actions while improving the quality of decisions. For example:

- **Insurance** companies analyze claims data after the fact to identify potential cases of fraud. Today these companies strive to embed the analysis in the claims process to prevent fraud from happening.
- **Telecommunication** companies have periodically analyzed historical customer data to identify customers who might leave and join a different service. The goal today is to deliver a real-time value score and appropriate actions or offers whenever a customer is in contact with the company.
- **Retail** organizations constantly strive to balance the inventories of each outlet to maximize sales. In the past, the goal was to identify the distribution center that had the required products to schedule a delivery. Today, some companies strive to identify the nearest truck that is already on the road and capable of fulfilling the order.

Regardless of whether an organization is trying to respond to current events more efficiently, bring new products and services to market faster or build more visibility into critical business processes, a dynamic warehouse must leverage an infrastructure that will:

- Deliver real-time access to data in context for each application
- Embed analytics as part of a business process
- Extract information from unstructured as well as structured information
- Support multiple applications with changing requirements and increasing volumes of data

Figure 1: Dynamic warehousing requires an extended infrastructure that connects all critical enterprise data



The data warehouse model is a critical element of this environment. Custom-built data models may fall short by not incorporating industry best practices for requirements gathering, a complete logical data model and extended templates for key performance indicators. It also may be difficult to extend a custom model fast enough to keep up with business changes. A dynamic warehouse model (see Figure 1) should be tightly integrated with the data integration tools that manage and load source system data and the data modeling tools that implement changes to reflect new requirements.

This executive brief provides an overview of how IBM Industry Data Models meet the requirements for a powerful and flexible data warehouse model and how the models fit into the complete infrastructure offerings for Dynamic Warehousing from IBM.

***IBM Industry Data Models***

For the past 10 years, IBM has been involved with thousands of data warehouse solutions. Based on the experience gleaned from those solutions, IBM Industry Data Models help ensure that a dynamic data 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 help 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”*

### **Delivering breakthrough productivity throughout the data warehouse life cycle**

IBM Industry Data Models deliver breakthrough productivity throughout the data warehouse life cycle, helping businesses manage every step of the creation of a dynamic data warehouse. Productivity starts from the initial business requirements analysis of the right key performance indicator (KPI) metrics and extends to data consolidation, data cleansing and the deployment of reporting online analytical processing (OLAP) cubes, datamarts and the business intelligence tool of choice. The resulting end-to-end data warehouse infrastructure enables the use of information in new ways to drive innovation, help increase operational efficiency and help lower risk.

#### **Hurwitz customer survey<sup>1</sup> of clients using IBM Industry Data Models**

- Companies determined that they 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 were able to identify a 15 percent decrease in the time spent in the deployment phase.
- When building a data warehouse using the models, companies were able to identify overall cost savings between 10 to 15 percent.

**Five-step data warehouse solution life cycle: Getting through the roadblocks**

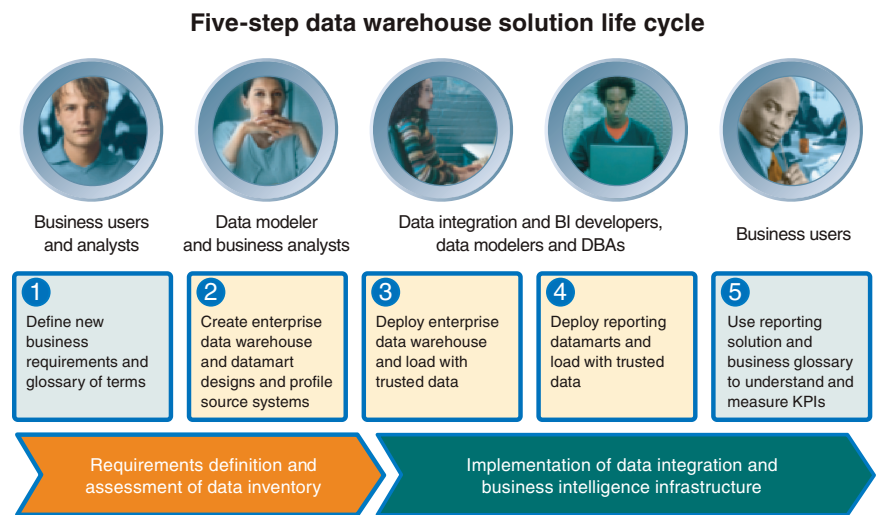
Just as processes have become a tangled web of complexity for many companies, the data needed to understand customers and their operations is often spread across numerous information silos in multiple incompatible formats. The problem is not a shortage of data or reporting systems, but the fact that information is not available in a consolidated, cleansed and business-ready format that clearly supports industry, financial, operational and compliance analysis.

While getting relevant information into the hands of business users can help businesses combat industry challenges, a data warehouse must consider the KPIs of the business—and the quality of the data that feeds these metrics must be sufficient. 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 a 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 the various management groups across a business have 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?

The data warehouse life cycle can be simplified into the following five key stages, shown in Figure 2, that exploit tried and tested industry best practices and technology to rapidly realize strategic value.

Figure 2: The goal of the five-step data warehouse solution life cycle is to decrease project time and reduce risk



**Step 1: Define requirements through collaboration**

Driven by business users and analysts, the scope of the reporting analysis challenge is first defined to identify the KPIs and the required data inventory. A glossary of terms is developed to help ensure that all interested business and IT parties work from the same information. This glossary helps users recognize and understand the 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 the current data inventory can support the reporting analysis, a thorough data profiling exercise should be applied to determine 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 data volume and velocity is unique to specific analytics, and the solution should be capable of managing the connectivity and scalability requirements necessary to keep a steady flow of data to the datamarts and business intelligence tools, enabling these tools 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—historical, operational or potential future scenarios. The business-centric datamarts, or 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 also helps increase reporting consistency and performance.

***Step 5: Provide analytical access***

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

**IBM Industry Data Models 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, retail, telecommunications and healthcare data models each contain thousands of hours of development efforts 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.

The components of the IBM Industry Data Model include:

**Industry business terminology data model (conceptual).** This data model is a list of business concepts that describe how a company defines itself and its measurements for success, such as profitability. All areas of the business and IT can use this model as a tool to help managers agree on specific definitions and measurements. The information is organized into a customizable nine-element hierarchy of business terms and definitions that is directly linked to other areas of the 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 to 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.

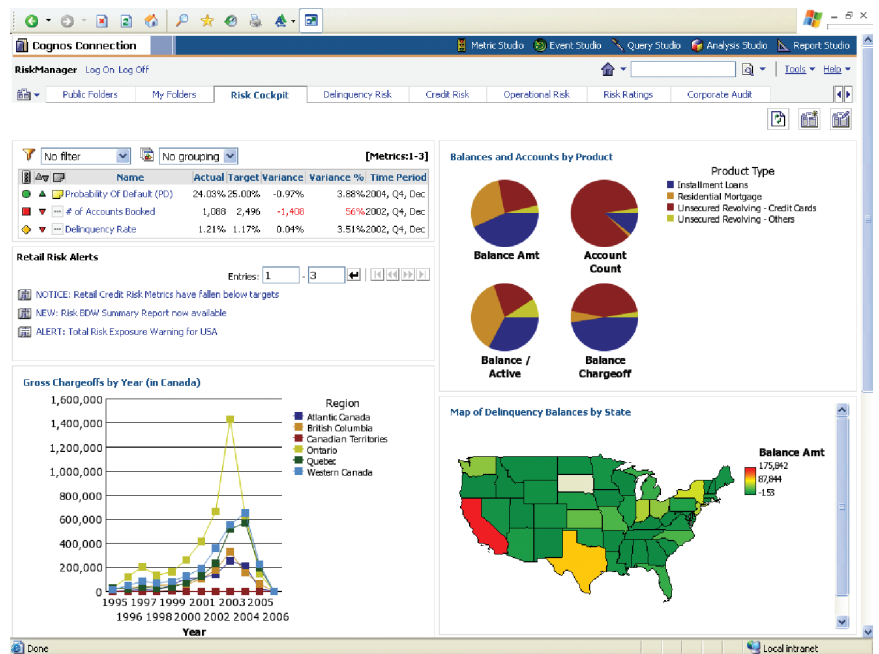
Figure 3: Each IBM Industry Data Model includes business solution templates specific to that industry

IBM Information Server and IBM Industry Data Models		
 <p><b>Banking</b> (Banking data warehouse)</p> <ul style="list-style-type: none"> <li>• Profitability</li> <li>• Relationship marketing</li> <li>• Risk management</li> <li>• Asset and liability management</li> <li>• Compliance</li> </ul>	 <p><b>Financial markets</b> (Financial markets data warehouse)</p> <ul style="list-style-type: none"> <li>• Risk management</li> <li>• Asset and liability management</li> <li>• Compliance</li> </ul>	 <p><b>Health plan</b> (Health plan data warehouse)</p> <ul style="list-style-type: none"> <li>• Claims</li> <li>• Medical management</li> <li>• Provider and network</li> <li>• Sales, marketing and membership</li> <li>• Financials</li> </ul>
 <p><b>Insurance</b> (Insurance information warehouse)</p> <ul style="list-style-type: none"> <li>• Customer centricity</li> <li>• Claims</li> <li>• Intermediary performance</li> <li>• Compliance</li> <li>• Risk management</li> </ul>	 <p><b>Retail</b> (Retail data warehouse)</p> <ul style="list-style-type: none"> <li>• Customer centricity</li> <li>• Merchandising management</li> <li>• Store operations and produce management</li> <li>• Supply chain management</li> <li>• Compliance</li> </ul>	 <p><b>Telco</b> (Telecommunications data warehouse)</p> <ul style="list-style-type: none"> <li>• Churn management</li> <li>• Relationship management and segmentation</li> <li>• Sales and marketing</li> <li>• Service quality and product lifecycle</li> <li>• Usage profile</li> </ul>

**Industry business solution templates (requirements).** Industry business solution templates are a collection of business-centric KPIs that make up the enterprise’s consolidated business reporting metrics and 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 including Lead Analysis, which consists of measures such as customer life-time value and dimensions such as campaign type and competitive win status (see Figure 3.) These templates are not only used to help business managers quickly identify the scope and customize their

analytical reporting requirements, but they can be used by IT to implement the datamarts and OLAP used by dashboard, scorecard or ad hoc reporting tools to gain business insight. Figure 4 shows a financial dashboard built with Cognos software and IBM Banking Data Warehouse Model.

Figure 4: Financial dashboard built using Cognos software and IBM Banking Data Warehouse Model



**Industry enterprise data warehouse model (design).** The enterprise data warehouse model defines a single analytical view—or single data repository—that is used to help ensure that the business solution templates are populated with appropriate and trusted data. Each IBM Industry Data Model portfolio contains an enterprise data warehouse model that is 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 consists of 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 specific requirements of the business.

#### **IBM infrastructure for Dynamic Warehousing**

The industry models work seamlessly with all of the components offered by IBM to create a complete infrastructure for dynamic warehousing. The complete IBM solution includes:

**IBM® Information Server platform.** 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 extended business intelligence and data warehouse environment. It includes integration services for data discovery, transformation, cleansing and delivery

that help ensure the right data is identified, aligned and delivered to the data warehouse, business intelligence applications or business processes as needed. The IBM Industry Data Models share information and metadata with IBM Information Server Business Glossary, creating an end-to-end view of business terms and definitions that speeds initial development and ongoing changes to the data warehouse environment.

**IBM Rational® Data Architect and Enterprise Model Extender.** 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). EME provides support for the management of enterprise models in order to successfully deploy and govern data warehouse projects specifically using the IBM Industry Data Models.

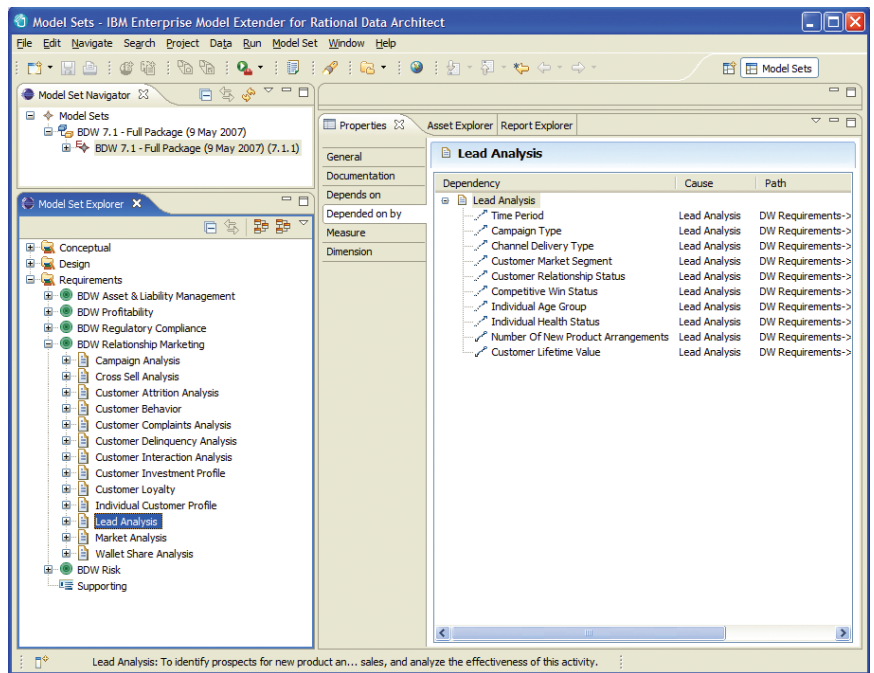
EME augments the functionality of Rational Data Architect with several specific features of the IBM Industry Data Models:

- **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

Using the Eclipse platform, EME fully integrates the requested capabilities for enterprise management of models with the capabilities of the data modeling tool (Rational Data Architect). It also integrates with IBM Information Server through IBM WebSphere® Metadata Server unified metadata architecture (see Figure 5).

Figure 5: Rational Data Architect with EME and IBM Banking Data Warehouse Model





**IBM DB2 Warehouse.** IBM DB2® 9 is a highly scalable, enterprise class database that can address the performance characteristics of any type of application. DB2 9 has a set of performance optimization features that enable the warehouse to address broader enterprise requirements. These features include:

- *Database partitioning for dedicated warehousing that can scale linearly*
- *Workload control features for prioritizing queries to help ensure that the most critical applications are serviced accordingly*
- *Deep Compression to increase efficiency of the warehouse and help reduce storage costs*

The value of the warehouse is extended by analytics with data mining and visualization to provide more dynamic business insight. These services are embedded in the warehouse to help provide better performance, increase efficiencies and help reduce costs. Using Rational Data Architect, the IBM Industry Data Models can leverage all of the advanced features of the IBM DB2 Warehouse.

**IBM OmniFind Analytics.** Built on a flexible, open architecture, OmniFind Analytics offers a unique and powerful combination of performance, security, scalability, enterprise reach and openness for applying advanced linguistic processing. Leveraging native Unstructured Information Management Architecture (UIMA) support, IBM OmniFind® Enterprise Edition also provides a rich platform for processing unstructured information to support enterprise search and business intelligence solutions. IBM Industry Data Models provide a framework for linking unstructured data to the data warehouse.

**IBM Master Data Management (MDM) solutions.** IBM MDM solutions support three key types of uses. The owners of record for different types of data—product managers or finance managers, for example—will use the solution to manage the state, context and definitions of their master data, such as clients, products or locations. At the same time, operational systems and applications leverage the MDM system as a single operational view of the master data to verify the accuracy and consistency of master customer data used in routine transactions like opening an account. Finally, analytical users benefit from the reference source of the master data fed into their data warehouse, because it maintains the current business perspective on whether two separate customers are members of the same household—an insight that may enhance the marketing department’s ability to effectively make the right up-sell offer over the phone or on the Web site. To accelerate implementation, the MDM solutions share common data definitions with the IBM Industry Data Models for key party elements like customer, thereby simplifying the integration and exchange of data.

**IBM Content Management.** IBM has unique content federation and integration capabilities that focus on interoperability and commitment to open standards. IBM and IBM FileNet® deliver innovative and industry-focused content management, business process management and compliance solutions, providing clients and business partners with high-value capabilities to make them more efficient and competitive. The federation capability combines the Industry Model KPIs with unstructured data in real time.

**IBM Global Technology Services.** IBM brings years of experience to data system design and validation of information management architectures to map a solution to client-specific business requirements. Each client solution is customized to meet unique needs and help optimize existing IT assets. IBM Professional Services helps clients configure an integrated IT architecture that incorporates leading technologies. Dynamic warehousing delivers business intelligence data and analytics from the warehouse and source systems to embed in business processes. For the first time, the data warehouse environment needs to interoperate with operational systems in a reliable and cost-effective way. These architectures are designed to maximize both current and subsequent investments in information management by integrating data to support business initiatives and improve the productivity of employees, customers and partners, as well as raise confidence levels in data validity and integrity. The IBM Industry Data Models provide a starting point for the design of a larger Dynamic Warehouse environment.

### **IBM Industry Data Models in action**

- A **telecommunications firm** in Europe used the IBM Telco Marketing 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.

### **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 basis 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 Information Server and Industry Data Models: A solid foundation for accurate, on demand business reporting**

When you must do more for the business with less staff and a smaller budget, it becomes critical to leverage industry best practices and a single data integration platform that delivers a solid foundation for deploying business reporting—accurately, quickly, on demand.

Using IBM Information Server and the IBM Industry Data Models as the foundation for your dynamic data warehouse, you can lay the groundwork for a strategic data warehouse deployment across the enterprise or a tactical datamart implementation for a specific project that offers long-term benefits for your business.

**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](http://ibm.com/software/data/integration)

To learn more about information integration and specific data model offerings, visit [ibm.com/software/data/integration/library.html](http://ibm.com/software/data/integration/library.html)



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<sup>1</sup> Hurwitz & Associates. *Using Data Models to Maximize the Value of Your Data Warehouse*. 2007.

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