

Using Data Models to Maximize the Value of Your Data Warehouse

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A GreenPaper™ Customer Benefit Study

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Executive Summary

Because of the dramatic changes in the financial services industry, companies are looking for technologies that help them streamline their business processes and systems, and leverage their business information across the organization. Hurwitz & Associates reviewed IBM's approach to leveraging data models to accelerate successful data warehouse deployments. In-depth interviews with customers of IBM's Insurance and Banking Data Models provided the basis for this research. The companies interviewed found tangible and business benefits using the IBM technology. Key findings included:

- Companies determined that they spend 30 to 40 percent less time during the modeling phase when using the IBM Data Models.
- 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.
- Companies estimated that the use of the IBM Data Models decreased the cost associated with building a data warehouse by approximately 15 to 20 percent, with several companies reporting savings of greater than 25 percent.

Introduction

No industries have been more impacted by the flattening of the world economy than banking and insurance. Some of the largest banking institutions operate in more than 50 countries and are continuing to expand and diversify into insurance products. Medium-sized banks are either growing rapidly to avoid being swallowed up, or are specializing in niche markets in order to compete with these emerging giants. Likewise, insurance companies are facing increasing levels of complexity as they consolidate into holding companies with many diverse lines of business. For example, a holding company created in the 1990's brought many separate insurance businesses together as one organization. As a result of the consolidation, the individual operating units must deal with cultural and language differences even as they try to grow and achieve profitability.

Clearly, these companies are facing unprecedented change. How is this manifesting itself? Consider the following examples:

...companies are looking for technologies that help them streamline their business processes and systems, and leverage their business information across the organization.



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- When a large European bank merged with other large banks across the globe, the IT team was required to create a single data model for the new company's consolidated data assets.
- When cars started showing up in large numbers in Chinese cities, a new automobile industry was born. A nascent Chinese automobile insurance company wanted to emerge quickly as the leader. It found that by leveraging industry best practices and 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 best practices-based models would be in place in time to help the company avoid fines.

The typical IT organization often has trouble understanding the data requirements from a business unit as well as the overall corporate context.

Synchronizing Information Management with Business Models

All of these examples have one element in common: they are all dependent on information becoming a powerful and valuable business asset. Increasingly, companies need their information sources to be adaptive enough to anticipate and to respond to change. This depends heavily on management's timely access to trusted information about its operations and the customers it serves. To achieve this goal, the IT organization must collaborate closely with the business.

Hurwitz & Associates believes that in order to make corporate information meet business needs, it must be in synch with the company's business model. Therefore, looking at information management through the lens of industry best practices is the best way to ensure collaboration. This is not an easy task to accomplish. The typical IT organization often has trouble understanding the data requirements from a business unit as well as the overall corporate context.

Typically, organizations have approached this problem by implementing departmentally-focused data marts to manage the reporting requirements of individual business units. The typical data mart includes a subset of the departmental data or enterprise model. But this approach no longer works in an era that requires business units to provide a comprehensive cross-enterprise view of their information assets. For example, if two different departments need to bring their two data marts together to gain a unified view of the information, they are often unable to proceed. Simply put, each data

mart may have a different model which inhibits the ability for data marts to work together. To be successful, the corporation needs consistency in data definitions that apply across all business units, while retaining the flexibility to deploy departmental reporting analysis solutions. To achieve this goal requires a three-phased approach: first, the development of an enterprise-wide business vocabulary; second, a comprehensive data model that provides a framework for the consistent consolidation of data; and third, data marts designed to support the reporting requirements of the organization.

The data model provides an enterprise view of the concepts and information about the business and the organization.

What Is the Role of the Data Model and How Is It Used?

The data model provides an enterprise view of the concepts and information about the business and the organization. It forms the foundation for an enterprise-wide information architecture. Businesses construct a data model so that all the important concepts that define the business are clearly understood, communicated and applied. In the data model, organizations define key business terms such as customer and the various relationships between the company and that type of customer. For example, one corporate entity may serve as a customer for one part of the business and as a supplier to another part of the business.

The data model provides a business description and a logical representation of what you mean by customer in relation to the rest of the business. It is possible to start with a pre-defined data model that can be modified based on a company's own business processes. These data definitions are equally important beyond analytics as part of a Service Oriented Architecture (SOA). For example, common data definitions are essential to the development of data services used by new applications or streamlined business processes, such as an account opening.

An effective data model is business-focused and contains business content. It needs to be flexible so that it can be modified to reflect new business approaches and needs, and it must anticipate the impact of change. While most organizations have many different data models, it's usually the catalyst of consolidated reporting, risk and compliance or new industry-specific measurement that drives the demand for an enterprise standard. With the adoption of a standards-based approach to their enterprise information



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assets, there is a need for a third-generation data warehouse solution: namely, a dynamic warehouse.

Why do organizations need a dynamic data warehouse? A traditional data warehouse was designed as a way to capture events that happened in the past. For example, the typical warehouse would “report” on customer banking deposits or analyze the severity of customer complaints about policies for the previous month. While this is extremely valuable to an organization, it provides a static view of past performance. It does not provide the flexibility to identify new trends and new business impacts or react in real time to potential opportunities or threats. The goal of a dynamic data warehouse is to provide an organization with insight across multiple business units and to enable a rapid and strategic response to business challenges.

A dynamic warehouse needs to have the following five characteristics:

- Ability to integrate with any data source – Information must be integrated into the warehouse in a way that ensures that the integrity of the information is maintained. In a dynamic warehouse, information integration needs to occur seamlessly.
- Ability to create and manage Master Data – to maintain a consistent understanding of key business entities such as customer, product, or supplier. A dynamic data warehouse needs this master data to achieve an enterprise-wide view of information that is readily available.
- Ability to codify business processes in a flexible manner – in order to use this data effectively, organizations need to be able to put information in context with innovative processes that need to be managed and changed dynamically.
- Ability to support and analyze all types of data formats – organizations need to be able to make use of all types of data, no matter what format they are stored in. This includes the use of operational, transactional, and unstructured data.
- Ability to create and manage an enterprise data model – data models help to identify, describe and structure business functions, data, and processes. These models are important to the dynamic data warehouse for a number of reasons, including speed to build the warehouse, flexibility of the information in the warehouse, an enterprise-wide view of data, and reuse.

The goal of a dynamic data warehouse is to provide an organization with insight across multiple business units...

The IBM Approach to Industry Data Models

Over the past 15 years, IBM has worked with hundreds of companies in the banking and insurance industries on data warehouse engagements. Based on the experience gained from these engagements, IBM has developed a set of Industry Data Models that leverage their expertise and best practices. Ultimately, the Models provide a business-focused framework for helping business and IT to collaboratively define business reporting requirements. Therefore, they enable IT to deliver the combined enterprise data warehouse and reporting marts (or cubes) infrastructure necessary to give the business the reports they want - the key performance indicators (KPIs) for a company within a given industry.

For financial services, IBM makes available three separate model portfolios: (banking, financial markets and insurance); each containing data, process and services models. These Models are designed to be used across a broad range of data governance, analysis, process and SOA scenarios. Consequently, they are closely integrated with IBM's data integration and data warehouse platform: Information Server and Dynamic Warehouse, WebSphere Process Server and Business Services Fabric offerings. In addition, there are Data Models available for telecommunications, retail, and health plan organizations.

IBM Data Models provide a pre-defined set of data models for creating industry-specific data warehouses. The main components of the IBM Data Models include a business vocabulary to ensure a common understanding between the business and IT, an enterprise data warehouse model, and a library of business solution templates (BSTs). The BSTs are designed to enable the creation of data marts and OLAP cubes containing the dimensions and measures that represent the KPI-based reporting requirements for the business.

The purpose of the templates is to enable rapid scoping of the areas of the data warehouse to implement, and to quickly gather common reporting and analysis requirements needed by the organization. These BSTs are broken down into focus areas. IBM supplies a number of focus areas specific to a vertical industry with each industry model.

... the Models provide a business-focused framework for helping business and IT to collaboratively define business reporting requirements.

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For example, the business solution template for Risk Management contained within the insurance Model enables profitability analysis and solvency analysis. Each analysis template contains measures and dimensions. A measure is something that the business would count, such as number of customers, number of products, or profitability. A dimension is something by which users wish to group measures; for example, time, product, branch, or customer segment.

These templates provide the framework for a particular type of analysis and the specific data needed to perform that analysis. The structure and the granularity of the enterprise data model and BSTs enable customization of the Models. In addition, individual segments of the Model may be implemented, without compromising the integrity of the overall model design or usage.

In this research paper, Hurwitz & Associates interviewed customers using two of IBM's Industry Data Models: Banking Data Warehouse (BDW) and Insurance Information Warehouse (IIW).

Banking Business Solution Template Focus Areas	Insurance Business Solution Template Focus Areas
<ul style="list-style-type: none"> • Profitability • Risk Management • Compliance • Asset and Liability Mgmt • Relationship Marketing 	<ul style="list-style-type: none"> • Customer centricity • Claims • Intermediary Performance • Compliance • Risk Management

Banking Data Warehouse

Banking Data Warehouse (BDW) includes more than 80 pre-defined business templates focused on five solution areas: profitability, relationship marketing, risk, asset and liability management, and compliance. Each of the templates is further broken down. For example, profitability includes details for 14 different business activities, including transaction analysis, product profitability, activity-based costing analysis, insurance product analysis, and investment arrangement analysis. These activities contain measures and dimensions. For example, product profitability would contain further measures for product performance analysis or product cost, and further dimensions for time, channel, and age group.

The structure and the granularity of the enterprise data model and BSTs enable customization of the Models.

Insurance Industry Warehouse

Insurance Industry Warehouse (IIW) provides a series of business solution templates specific to the insurance industry. Each of the templates is further broken down by activity. Examples of these activities include analytical CRM, profitability-claim efficiency, profitability-intermediary efficiency, profitability-business efficiency, risk and compliance-Sarbanes-Oxley, and risk and compliance-Solvency II. Like BDW, IIW includes measures and dimensions to support analysis and reporting in each of these areas. In all, IBM provides more than 80 pre-defined business templates in this industry, as well.

Many of the customers interviewed were discovering that the dramatic changes in their business were making it very difficult to leverage their warehouses in an effective way.

Results of Customer Benefit Study

In order to verify the importance of using data models, Hurwitz & Associates engaged in a detailed interview process with 12 IBM Data Models customers – six banks and six insurance companies. The purpose of the interviews was to understand the customers' experience with the Models, including the business and technical benefits they derived from using the Models. In all situations, the data warehouse was being used for business-focused activity such as profitability analysis, customer retention and segmentation analysis, product pricing, actuarial analysis, compliance, image tracking, and cross-selling/up-selling. The vast majority of organizations in the study had used the Models for more than two years and on more than two projects.

Hurwitz & Associates asked the respondents about the top drivers for implementing the Model, as well as to consider how their company has benefited across the four phases of building a data warehouse: modeling, requirements gathering, design, and implementation. The interviews also focused on information quality and the business benefits associated with the IBM Industry Data Models. We asked whether these benefits were significant, moderate or only somewhat beneficial. Where applicable, we also asked the companies to quantify the benefits from the Models.

Customer Experience Prior to Implementing the Models

Before understanding the value companies gained from the use of the IBM Data Models, Hurwitz & Associates first asked customers how they were approaching their information needs before they implemented model-based warehouses. While some companies used no models at all, many were building their own models from scratch. Many of the customers interviewed were discovering that the dramatic changes in their business were making it very difficult to leverage their warehouses in an effective way. It was simply too technically difficult and too time-consuming to continue on their current path.

How did you design your DW prior to implementing the Models?

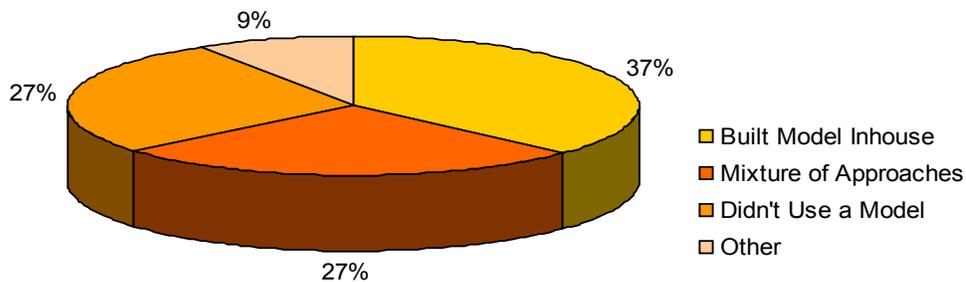


Figure 1 illustrates how the respondents designed their data warehouse prior to using the IBM Models. The figure shows that prior to implementing the Models about 1/3 of the companies built their own models in-house and 1/3 used a mixture of approaches. The remaining 1/3 may have been building a data warehouse for the first time and did not use a data model.

For example, one of the interviewed companies that had a warehouse without a modeling approach felt that it was simply “dumping rather than creating an integrated table for products.” When management required that the company create a consistent view of data across the organization, it realized that its approach was broken and would not be able to scale. Several other companies began to implement models when they embarked on a set of acquisitions. Some companies that were dealing with regulatory compliance found that a model helped them organize their data in a way that made compliance reporting easier. Still others were entering new markets and needed the model as a way for them to quickly leverage industry best practices in their data warehouse so they could move the business more quickly.

Regardless of their previous attempts or data warehouse history, the top driver for using the IBM Industry Models was the need for a better design. For example, one large European insurance company we spoke with had many data marts that had been populated from legacy systems. The design was problematic because it was almost impossible to reuse the existing model for another project. It was particularly difficult if a task or requirement changed. Since the company’s business was changing dramatically, it could not afford to restructure the model at every turn. The company realized its data warehouse needed a better design.

Regardless of their previous attempts or data warehouse history, the top driver for using the IBM Industry Models was the need for a better design.

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While this was indeed the top driver, there were other important issues (see Figure 2). Many organizations were driven to adopt a model because of the need to ensure data quality and to ensure that the resulting data warehouse would accurately represent the needs of the business. Pragmatically, many companies needed to be able to create consolidated reports across departments and subsidiaries.

Companies experienced significant technical benefits using the IBM Data Models across the four phases of data warehouse development.

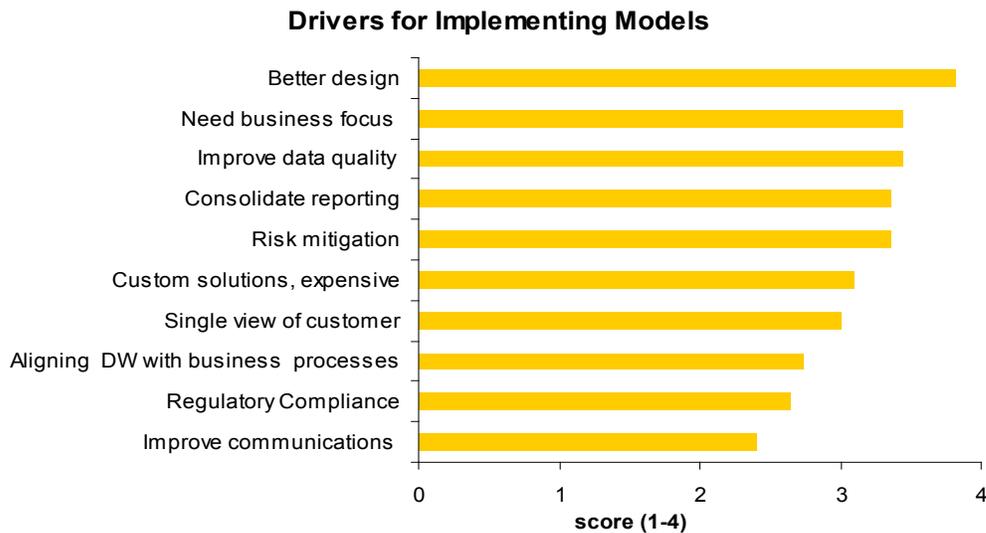


Figure 2 illustrates the top drivers for implementing the Models. Respondents ranked the benefits on a scale from 1-4 (1 = no significance, 2 = somewhat, 3 = moderate, 4 = significant). The chart depicts an average of rating scores.

Technical Benefits from IBM's Data Models

Companies experienced significant technical benefits using the IBM Data Models across the four phases of data warehouse development. All of the respondents said that the consistency of terms and definitions within the framework helped to provide a standard and consistent approach to modeling. This framework therefore helped to accelerate the development cycle. The standardization of the Model helped across multiple phases of the data warehouse implementation. On average, respondents noted a 30 to 40 percent decrease in time spent in the modeling phase, a 20 to 25 percent decrease in the time spent in the design phase, and a 15 percent decrease in the time spent in the deployment phase. The use of Models also helped IT to identify interdependencies between lines

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of business, which is critical in getting a cross-enterprise view. These top technical benefits are illustrated in Figure 3 and described below. The bottom line is that the resulting warehouse provided more accurate and consistent information, enabling the business user to maximize the use of the information in the warehouse.

In order for the data warehouse to be effective in supporting organizational decision-making, the data needs to be consistent across the warehouse.

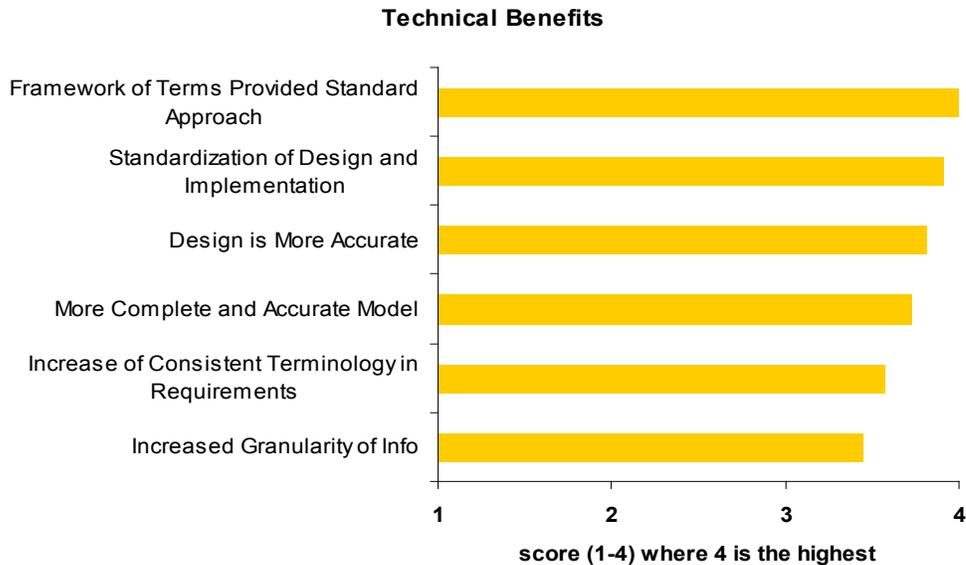


Figure 3 illustrates the top technical benefits found in implementing the Models. Respondents ranked the benefits on a scale from 1-4 (1 = no significance, 2 = somewhat, 3 = moderate, 4 = significant). The chart depicts an average of rating scores.

In the following section we will discuss the survey results based on four of the top technical benefits of implementing the Data Models. These include the benefits of a framework; the ability to create an accurate and complete model; the value of consistent business terminology; and the benefit of using a model to increase the granularity and hence the flexibility of information in the warehouse.

- **Framework of terms and definitions helped to provide a standard and consistent approach to models.**

In order for the data warehouse to be effective in supporting organizational decision-making, the data needs to be consistent across the warehouse. All of the respondents (100 percent) cited the ability of the Data Models to provide a standard and consistent approach to modeling as a significant benefit. This consistent approach translated to



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increased standardization across all of the phases of the warehouse development. For example, one large financial services company built a data warehouse to feed data marts that would be used to analyze customer information in order to improve customer retention. Prior to implementing the Model, it had built several data marts without a consistent design. Because each mart used a different business vocabulary, it was almost impossible to create consolidated reports. The reports that were produced were misleading and therefore introduced risk into the retention strategy. A primary goal of the new data model-driven approach was to institute a common business vocabulary across multiple business units within the financial services organization.

- **The Data Model helped design and build a more complete and accurate data warehouse.**

Accuracy is critical to an effective data warehouse. Ninety-two percent of the respondents said that the design of the data warehouse is more accurate because it is driven from the Model. Three-quarters of the respondents said this benefit was significant.

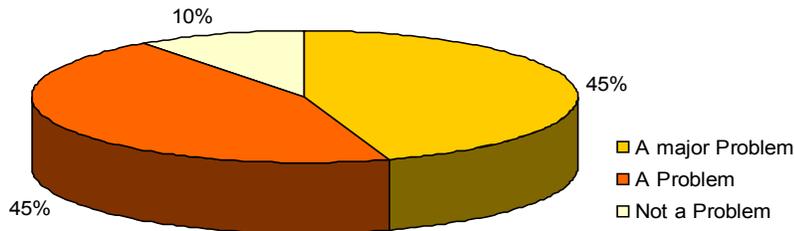
In one large insurance company, the actuaries initiated the data warehouse project because they wanted to analyze data related to their policy lines. They needed the warehouse because the company has multiple policy administrators for multiple policy lines. Initially, the IT organization began to build its own set of models. However, it quickly became apparent after several months of effort, that the company would be better served by leveraging established models that would result in a consistent warehouse. The end result was a set of models that helped standardize the analysis of data across the company. Because the information was stored consistently in a data warehouse, the design was more accurate than would have been possible with other approaches. IT management determined that the consistency of the approach provided by the IBM Data Models made them more successful – it was easier to understand exactly what the business needed and to locate, analyze and report on that information when required by the business.

- **Model increased use of standardization and consistent terminology in requirements.**

Business and IT need a high degree of collaboration in order to create a data warehouse that will provide all the information needed by the business. This is very hard to accomplish for many companies. Ninety percent of companies in the survey acknowledged that prior to implementing the Data Models they had a hard time gathering business requirements in a standard and consistent way. (See figure 4 on the following page.)

Because the information was stored consistently in a data warehouse, the design was more accurate than would have been possible with other approaches.

Prior to utilizing the Models, was inconsistent terminology a problem in the requirements phase?



A North American insurance company discovered that the Model templates provided a good framework for how the business actually works.

Figure 4 illustrates how the respondents felt about whether or not inconsistent terminology was a problem during the requirements phase.

All survey respondents observed that the Models helped their organizations to increase the use of consistent terminology in the requirements phase, and the majority said this made a significant impact. The Models helped to provide a structure that eased the difficult process of bridging the language gap between IT and business. The survey respondents found that use of the Models helped IT to formulate more directed questions for the business. According to an insurance industry data modeler, “Seeing things in the Model helps us to ask the right questions.”

A North American insurance company discovered that the Model templates provided a good framework for how the business actually works. For example, management discovered that the Model could be used to help business management determine the best pricing structure across more than 20 lines of business. The company was also able to use the Data Model to standardize and improve the clarity of business reporting requirements.

• The data warehouse is more flexible because of the increased granularity of information

Eighty-five percent of the respondents stated that the granularity of the information provided in the Models improves the flexibility of the warehouse. This is an important benefit because as changes occur in the business, the business needs to be able to adapt its data warehouse accordingly. The Models provide the flexibility to accomplish this goal. The structure of the Models allows companies to get to a low level of granularity. For example, a data

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warehouse manager from an insurance company noted that the models allowed the company the ability to drill down into information about a particular insurance activity - in this case, premium reporting. The granularity of the measures and dimensions provided in the Model enabled the company to provide flexibility in its reporting and analysis of premiums. In fact, she felt that her group was able to offer more sophisticated reports because of the granularity of information the Model provides.

Business Benefits

In the rapidly changing environment of insurance and banking, IT needs to provide a data warehouse that best meets business needs. This means that the data warehouse must provide a consistent and accurate view across lines of business in a timely manner. The warehouse must also be flexible enough to adapt to change. The Data Models are important because they provide a bridge between IT and business. These models provide the standard, consistent view that ensures that management can make the most effective decisions about its operations. They also help reduce the time to actually implement the warehouse. These benefits are described in the figure below.

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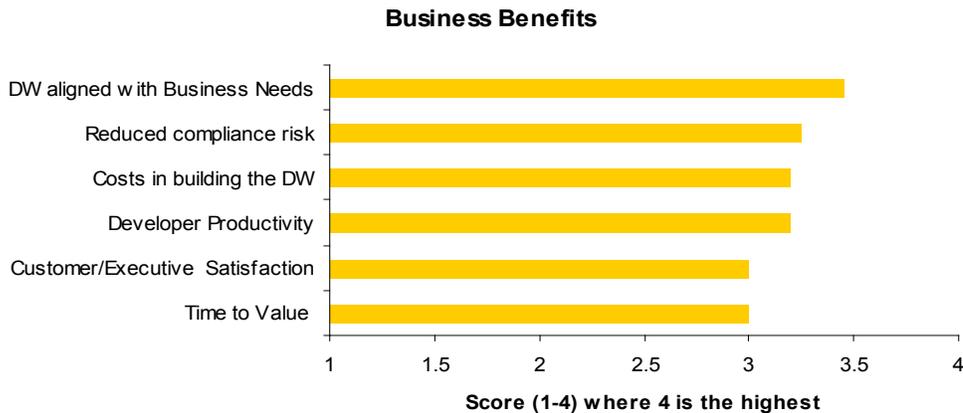


Figure 5 illustrates the top business benefits found in implementing the Models. Respondents ranked the benefits on a scale from 1-4 (1 = no significance, 2 = somewhat, 3 = moderate, 4 = significant). The chart depicts an average of rating scores.



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- **Data warehouse is directly aligned with the business needs**

Eighty-three percent of the respondents stated that the use of the Models helped to directly align the warehouse with business needs. More than 50 percent of respondents cited this benefit as significant. The majority of the respondents also noted that the Models helped give senior management and line of business executives what they needed.

For example, one European insurance company is using the Models to help build a warehouse to track product profitability and sales for its home and business casualty insurance lines. The IT organization has built a portal for business users to access and analyze the data using its in-house Business Intelligence (BI) tool. According to this company, the Models show how different parts of the business are connected together. This helps IT understand what the business needs and it can use the information from the Models to better understand the needs of the business. It also helps the business see the interconnectivity between various business lines, which had been impossible when these systems were disconnected. All of this helps to align the data warehouse with what the business really needs. As a result, the insurance company has realized an improvement in customer satisfaction.

In another example, an insurance company IT executive reported that he was able to provide the business what it needed – an enterprise-wide view of all products sold to an individual customer across business lines. Prior to implementing the Models, this company couldn't tie information together at an account level to do this sort of analysis.

- **Cost savings**

Seventy-five percent of the respondents reported that use of the Models helped decrease costs associated with building the warehouse. The other companies in the study were not able to quantify any possible cost savings. Twenty-five percent said this cost decrease was significant. On average, cost savings resulting from the Model use were 15-20 percent, with several respondents reporting savings of greater than 25 percent.

Estimated cost savings spanned a broad range, extending from 5 percent to greater than 25 percent. Many companies observed that cost savings would increase as the team became more familiar with the Models and used them on multiple initiatives. For example, an IT executive from one large North

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American bank stated that his organization built the business case based on the assumption that it would be able to reuse components of the Model. The IT executive reported that the organization was able to reuse a third of the first and second projects. However, the greatest benefit took place with the next project, where there was no need to do further modeling.

- **Productivity improvements**

Sixty-seven percent of the respondents said that their developer productivity increased because of the Models. Almost half said that this improvement was significant. For those that could quantify the impact, on average this productivity increase was about 70 percent.

- **Faster time to value**

The Data Models simplify and accelerate the deployment of a data warehouse, providing a faster time to value for business users. More than 50 percent of the respondents stated that they are getting a faster time to value. For example, one banking executive reported that his company had been through a major restructuring because of a merger. Initially IT relied on its existing operational systems to provide business with the consolidated data it needed. However, because the data sources were disconnected from the data warehouse, it was difficult to create innovative reports the business demanded. Once the organization began applying the Data Models to the warehouses, users were able to get the reports that they needed much faster. These users found that this helped improve their overall decision-making.

Conclusion: Model-Driven Data Warehouses as a Business Imperative

Leveraging industry-focused data models can have positive benefits for customers, as demonstrated by the results of the study conducted by Hurwitz & Associates. While there is clearly a learning curve that requires business and IT to work together, the results are apparent. Businesses that leverage models have gained business insights and access to cross-departmental data that was unattainable with traditional approaches.

But, implementing a data model-driven approach to creating a dynamic warehouse is not a simple process. It requires a best practices approach. While the companies represented in this study had different objectives for their modeling and data warehouse implementations, the lessons learned from their experiences were

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consistent. Based on our analysis of company experiences with data models, Hurwitz & Associates recommends the following five key practices as guidelines for companies that may be embarking on the process.

- **Start from the top.** When business leaders understand that a model-driven approach can allow them to gain insights previously unachievable, they will support this approach. Business leaders can understand the benefit from quality data based on a specific business vertical approach.
- **Data models will not provide a quick fix to a complicated problem.** It will take several projects before the long-term value becomes evident. IT management needs to set the right expectations for both IT and business management.
- **IT needs to take the time to understand business processes.** It is typical for IT to want to move quickly to begin building a warehouse. However, for a model-based approach to be successful, the IT staff has to take the time to understand the business, including the processes and inter-relationships between the various business units. This depth of understanding will reap dramatic productivity results.
- **Establish a data management Center of Excellence (CoE).** There is no better way to ensure that the business and IT organizations move quickly to a model-driven approach than to establish a Center of Excellence (this includes Dynamic Warehousing and data integration). Areas of focus range from a deep understanding of issues such as the structure of the business, specific industry models, Master Data Management, and meta data. In the end, the CoE will help with education, skills development, and communications across business units.
- **Focus on standardization.** Models based on standardization across business units will help an organization implement measures that they can monitor across all of the business to compare different lines of business.

About Hurwitz & Associates

Hurwitz & Associates is a strategy, analyst, and customer benefit research company focused on understanding the value of emerging software technologies including service oriented architectures, data integration, web services, and the overall manageability of a highly distributed computing environment. A GreenPaper is the culmination of customer benefit research and analysis that focuses on the tangible technical, financial, and business benefits of adopting pragmatic solutions. Additional information on Hurwitz & Associates can be found at www.hurwitz.com.

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