

Data Warehousing

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What is Data Warehousing?

According to Wayne Eckerson, a consultant with the Patricia Seybold Group, data warehousing is "...the process of turning raw data into information that users can analyze to make tactical and strategic decisions...helping to make better decisions faster and...capitalize on opportunities..." Ken Orr of the Ken Orr Institute in Topeka, Kansas, says it is "a set of significant new concepts and tools...to provide key people access to whatever level of information is necessary to survive and prosper in an increasingly competitive world...A rich, integrated environment oriented to the needs of users, with management tools for maintaining and adding value to enterprise data."

Simply stated, data warehousing is a process, not a product, for "organizing and utilizing data" in order to turn data into information. It is a technique for properly assembling and managing data from various sources in order to answer business questions and make decisions that were not previously possible. It pulls data together from legacy systems and databases and turns it into usable business *information* in a centralized store of detail data called the Enterprise Data Warehouse. It may include a Data Mart (or departmental warehouse), which is a special purpose subset of a larger data warehouse in which data is selected and organized for a particular set of usage requirements.

A data warehouse can be subject oriented, providing the ability to look at a customer in total; it can be time-variant, capturing data at different points in time for trend analysis, or it can be non-volatile, or unchanging.

How Companies are Using Data Warehousing

There are four key ways that companies are using data warehousing: (1) To increase the speed and flexibility of analysis; (2) To provide a foundation for enterprise-wide data integration and access; (3) To improve or re-invent business processes, and (4) To gain a clear understanding of customer behavior. These are summarized below.

By increasing the speed and flexibility of analysis, companies can obtain accurate financial results quickly. This allows them to understand in minutes and hours the financial state of the business, instead of waiting weeks and months, so that they can immediately pinpoint significant variances and take necessary action. They can immediately analyze advertising, promotions, and other event driven occurrences, as well as assess risk due to unpredictable events.

The use of data warehousing techniques allowed a large technology firm to "...spot \$10 million of inventory that we hadn't billed. And we were able to bill that inventory and recognize the revenue. So we just about paid for the system the first time we used it." A large retailer with 400 stores, 300 users, 150,000 products, and

10,000 vendors was able to re-engineer its entire merchandise and inventory management process.

Companies these days are storing an abundance of data. For example, Wal-Mart accumulates 65 weeks of daily sales information on every item in every store across the world. In late August, during the back-to-school season, some products were selling well in one part of the country and not in another.



Because of the business information provided by data warehousing, they were able to shift the products to where they were needed, enabling Wal-Mart to sell them at a profit rather than at a discount.

Enterprise-wide data integration and access will provide a single, consistent system of record-keeping from multiple sources, thereby integrating "islands" of information. It will allow cross-functional information distribution and analysis at multiple levels, help to align corporate and information technology goals, and provide a foundation upon which to respond rapidly and cost-effectively to changes like reorganizations, corporate downsizings, mergers and acquisitions, and new strategic initiatives. All of this allows for efficient resource utilization.

A major railroad uses a centralized data warehouse which seamlessly combines thousands of sources, allowing 900 users to access critical business information directly. Before data warehousing, they had thousands of disparate data files, redundant and conflicting data, and voluminous extracts and summaries, and they were unable to manage resources. Data warehousing solved these problems by providing "anywhere, anytime" information access, hundreds of thousands of shipping rates, real-time price quotes, and resource location and allocation.

An American bank had 36 million customer accounts from 23 different operational systems. They were able to pull data from their different departments--mortgage, savings, checking, loans, credit cards, and time deposits--to

improve operations and results in the areas of marketing, credit risk management, portfolio analysis, and retail banking. This resulted in \$30 million in new business, risk avoidance, and profits.

Another major consumer retailer, before utilizing data warehousing, had 18 separate databases for such things as sales, inventory, margin, and distribution. By warehousing their data, they had a single, integrated system that allowed everyone in the company, from the president to the replenisher, to look at the business the same way.

A clear understanding of customer behavior assists the company with establishing a single view of a customer across various products, services, and business units. It provides information regarding who customers are, what customers are and are not buying, and which ones are most and least profitable. It also allows them to understand better customer development and loyalty and the effectiveness of frequent shopper programs, household analysis, and target marketing. For example, a major American airline uses data warehousing to target market to its 26 million frequent flyer members, saving an estimated \$100 million by cutting back on expensive mass media campaigns.

Business Reasons for a Data Warehouse

Data warehousing has been successful in addressing the top Information Technology issues: aligning IT with corporate goals, instituting cross-functional information systems, and organizing and utilizing data. Building a data warehouse makes it possible for a company to do the following:

1. Provide access to information from a single or distributed source;
2. Develop transformation of data for decisions;
3. Combine data from many disparate data sources;
4. Define, bless, refine, cleanse and reconcile data;
5. Ensure data consistency throughout the enterprise;
6. Develop timeliness of decisions;
7. Provide historical perspectives of information for analysis uses;
8. Lower total information technology costs;
9. Drive new business and relationship opportunities;
10. Create a Corporate "memory" of activities and resource measurements.



It is important to realize that it is the *understanding of the business* that determines the success of a data warehouse, *not* the use of technologies. The key is to develop the logical data model and to use it as the blueprint for the construction of the data warehouse.

In summary, a Data Warehouse is a process, not a product, that addresses most enterprises' major business challenges and technological issues. It requires an infrastructure for gathering and transforming source data into meaningful information, and it should provide the following items to the enterprise: (1) Enterprise-wide and DataMart solutions; (2) Ability to adapt to the viewpoints and needs of both Information Technology and Business Users; (3) Flexibility, openness, scalability, and growth potential; and (4) The ability to embrace present and future technologies.