

: What are advantages and disadvantages of data warehouses?

by Dan Power

Editor, DSSResources.com

The concept of a data warehouse for decision support traces back to about 1990 and the works of Bill Inmon, Ralph Kimball, Barry Devlin and Paul Murphy. Inmon (1995) defined a data warehouse as "a subject-oriented, integrated, time-variant and non-volatile collection of data in support of management's decision making process". Since then, data warehouses have gotten very large and single subject data marts have proliferated. Given the widespread adoption of this maturing technology, it seems appropriate to review the advantages and disadvantages.

Not everyone agrees on the scope and definition of a data warehouse. Kimball (1996) defined a data warehouse as "a copy of transaction data specifically structured for query and analysis". Some authors differentiate an enterprise warehouse or emphasize the vision of creating a single, unified version of the truth for the enterprise. For most purposes a data warehouse is a database accessible across the enterprise that contains historical and current data about all of the important entities found in the business. The data is static and can not be changed once it is added to the database and the data may come from many sources inside and outside the enterprise. The relations may not be fully normalized, but the field names and data types are reconciled across differences in source systems. The data warehouse is a system of record and provides a "single version" of the truth about enterprise activities.

In May 2000, M. Choudhury wrote asking "Why do you think companies are implementing data warehouses at a staggering rate?" My response was "companies are implementing data warehouses for 2 major reasons: 1) managers want more information to support their decision-making and 2) competitors are implementing data warehouses and that has a 'snowball' effect that encourages other companies to implement data warehouses."

He also asked "What do you think are the primary motivators for investing in a Data Warehouse/Data Mart? i.e. identifying new customers, reduce cost of operations, etc." In response, "I think the primary motivation for investing in data warehouses is to provide more timely information for decision-making. Some managers claim the purpose is to serve current customers better, but managers aren't always clear about how that will happen. The growth of the Business Intelligence/OLAP software market indicates that managers need more than faster access to data. Managers need analysis of data to gain benefits from data warehouses/data marts."

: What are advantages and disadvantages of data warehouses?

So what advantages are there from developing a Data Warehouse? The three major advantages are:

1. Integrating data from multiple sources;
2. Performing new types of analyses; and
3. Reducing cost to access historical data.

Other benefits may include:

1. Standardizing data across the organization, a "single version of the truth";
2. Improving turnaround time for analysis and reporting;
3. Sharing data and allowing others to easily access data;
4. Supporting ad hoc reporting and inquiry;
5. Reducing the development burden on IS/IT; and
6. Removing informational processing load from transaction-oriented databases;

What disadvantages are there in implementing a data warehouse?

The major disadvantage is that a data warehouse can be costly to maintain and that becomes a problem if the warehouse is underutilized. It seems that managers have unrealistic expectations about what they will get from having a data warehouse.

References

: What are advantages and disadvantages of data warehouses?

Devlin, B.A., and P.T. Murphy, "An architecture for a business and information system," IBM Systems Journal, Vol. 27, No 1. 1988.

Inmon, W.H., Third Wave Processing: Database Machines and Decision Support Systems, QED Information Sciences, Inc., 1991.

Inmon, W.H., "What is a Data Warehouse?" Prism, Volume 1, Number 1, 1995.

Kimball, R., The Data Warehouse Toolkit: Practical Techniques for Building Dimensional Data Warehouses. 1996.

Power, D., "What are the advantages and disadvantages of Data Warehouses?" DSS News, Vol. 1, No. 7, July 31, 2000.

Author: Daniel Power
Last update: 2008-12-03 09:12