INFORMATION TECHNOLOGY

Strategies for Data Warehousing

How can companies ensure that their data warehouse delivers as promised?

More and more companies are integrating their data with those of supply-chain partners, acquired divisions or vendors to whom they’ve outsourced their IT function. This melding of data promises enticing advantages, such as real-time updating of customer information, the opportunity to focus on core capabilities and instant forecasting of inventory needs to suppliers. With such advantages, companies look forward to sending new products and services to market faster than ever, providing better customer service and slashing production and inventory costs.

But too many firms fail to realize these benefits. For some, the data warehouse created to combine data from multiple sources has a user interface that is hard to navigate or contains program code that is difficult to maintain. For others, data generated by the system turn out to be inaccurate or irrelevant to users’ needs or are delivered too late to prove useful. And for organizations that outsource their data warehousing, misunderstandings between IT customers and vendors about expected service levels can crop up once the system is implemented.

A study published in the December 2003 edition of the online journal Communications of the AIS examines possible explanations for these problems and proposes guidelines for boosting a firm’s chances of receiving the desired data warehouse performance. The study is “Data Warehousing Implementation and Outsourcing Challenges: An Action Research Project With Solelectron” by Fay Cobb Payton, assistant professor of information technology, and Robert Handfield, professor of supply chain management, both at North Carolina State University’s College of Management.

To closely examine the challenges associated with the implementation of a data warehouse by a service provider, the researchers decided to conduct a longitudinal action-research study on a single company. Blending participant observation, unstructured interviews and analysis of archival information, they interacted with five managers at contract electronics manufacturer Solelectron Corp. over a period of 18 months, building in multiple “check points” over that time horizon to validate their findings. Over its nearly three decades of operation, Solelectron had grown rapidly through numerous acquisitions and had outsourced its IT function. On the basis of what they saw and heard at Solelectron, the researchers drew several conclusions about how firms operating under similar conditions might obtain better performance from their data warehouses.

Most important, the authors recommend that companies wishing to integrate their data with one or more outside parties must first re-evaluate all internal business processes to ensure that existing data are in a format that managers and employees can readily use.

Organizations must also consolidate data from various systems and departments into a centralized location, as well as evaluate the data’s reliability. Reliability stems from data accuracy at the time of input into the system and code-definition quality.

The researchers also advise that companies establish a set of metrics with which to evaluate data-warehouse performance. They defined eight metrics for the Solelectron study: the percentage completion of data tables; connectivity (based on ISP transfer rates and other criteria); data integrity; the usage rate of data tables and reports; the delivery time for requested data tables; the number of days the internal IT group or IT vendor needed to resolve problems; the number of times per day that users “hit” the data warehouse’s databases; and the run time (the number of minutes required to produce all extracted tables, by site).

Managers can use such metrics to evaluate potential IT vendors’ past performance before selecting a final candidate, to communicate about performance expectations and problems with a vendor, or to renegotiate service-contract terms once a contract has been implemented. The researchers also suggest using these metrics to continually track a data warehouse’s performance.

In addition to re-evaluating internal business processes and developing pre-and postimplementation metrics, the authors recommend defining and securing the team skills required for successful data warehouse implementation before choosing a data-warehouse vendor. Solelectron, for example, hired two data-warehouse architects and strengthened its small IT group’s sourcing and order-fulfillment capabilities. Using a phased-in implementation (rather than a “direct cutover” approach) can further increase the chances of success because it enables managers to monitor data integrity and system quality issues step-by-step.

Finally, companies need to avoid “scope creep” once a warehousing project has been implemented. Through steering committees and cross-functional teams, managers can conduct ongoing analyses of user requirements and prevent the infiltration of irrelevant demands.

For more information about the study, contact the authors at fay_payton@ncsu.edu and Robert_Handfield@ncsu.edu.

— Lauren Keller Johnson

Reprint 45301. For ordering information, see page 1.
Copyright © Massachusetts Institute of Technology, 2004. All rights reserved.