

: *How has data warehouse usage evolved?*

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It seems managers have accepted the idea of creating a separate data warehouse. Analytical and decision support systems **should** be kept separate from transaction processing systems. Predictably, data warehouse usage has expanded over the years. Initially a data warehouse provided an integrated single-view of organization data for reporting. The reporting was generally routine and reports were created regularly. The next development in data-driven decision support and analytics was an increase in ad hoc querying and analysis. More sophisticated predictive models and data mining then became popular tools for analysts to use with data warehouses. More recently, data warehouses have been used for tactical, real-time decision support in customer-facing operations situations. Planning and building subject-oriented data warehouses remains a good idea.

Advances in analysis and visualization technologies, the development of open source tools like R and Apache Hadoop are creating new data warehouse enterprise opportunities. Also, the significant decline in hardware and software costs for distributed processing has facilitated greater use in the enterprise.

Using data from a database to "make" decisions using business rules is the most recent development in data warehousing. This development has some problems. Supposedly, active data warehousing can automate decision-making when a customer interacts with a web site or a staff person interacts with a data warehouse application. According to Brobst and others "Interactive customer relationship management on a web site or at an ATM is about making decisions to optimize the customer relationship through individualized product offers, pricing, and content delivery. As technology evolves, more and more decisions will be executed with event-driven triggers to initiate fully automated decision processes."

Tactical data-driven decision support is focused on supporting employees in the field who are implementing plans. Examples include: 1) supporting inventory management with just-in-time replenishment, 2) real-time scheduling and routing for package delivery, 3) altering a marketing or fundraising campaign based on current results. An example of a decision made with a business rule and active data warehouse is determining the best offer to give a specific customer based on a real-time event, such as a significant ATM deposit.

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