

# *: What companies have gained a competitive advantage by building a DSS?*

by Daniel J. Power

Editor, DSSResources.COM

Software vendor salespeople and their sales materials often claim that a specific software product like an Enterprise Data Warehouse (EDW), an Enterprise Resource Planning (ERP) system, or a Sales and Operations Planning (SOP) system will provide a company a competitive advantage. Proving or disproving this claim is challenging. The problem in answering this question is that managers want to maintain any advantage they gain and hence they are reluctant to release details about the effectiveness and advantages of new decision support and analytic systems. Also, DSS that provide an advantage at one point in time may seem dated or ordinary after only a few years time has elapsed. Any advantage from software and technology can be fleeting and short-term (cf., Feeny and Ives, 1990).

Porter and Millar (1985) provided a major theoretical perspective on how information could provide competitive advantage. Information and decision support can change how managers organize and perform discrete activities and can improve that performance gaining competitive advantage. A number of other theories related to competitive advantage suggest that deployment of new resources (cf., Barney, 1991) like an innovative decision support system can provide a sustainable business advantage.

DSS can be important and useful and necessary and yet not provide a competitive advantage. Many consulting firms and vendors focus on gaining competitive advantage from a data warehouse or a business intelligence system and that can happen. Many DSS projects don't however deliver such results and they probably weren't intended to create competitive advantage.

In a classic literature review, Kettinger et al. (1994) identified a number of companies that had gained an advantage from Information Systems. Some of those systems were Decision Support Systems, but most were Transaction Processing Systems or a combination. The following examples of strategic DSS are from their article:

Air Products -- vehicle scheduling system

Cigna -- health risk assessment system

DEC -- expert system for computer configuration

First National Bank -- asset management system

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IBM -- marketing management system

McGraw Hill -- marketing system

Merrill Lynch -- cash management accounts

Owens-Corning -- materials selection system

Proctor & Gamble -- customer response system

In 1984, the *Morning Call* reported that "Air Products and Chemicals, Inc., has spent \$1 million to save \$2 million a year in the cost of delivering its liquid oxygen and liquid nitrogen. The Trexlertown company uses a computer program, based on research at University of Pennsylvania's Wharton School, that plots the most effective, economical schedule for a fleet of delivery trucks. Air Products estimates the program, which it calls a vehicle scheduling model, saves 6-10 percent of its distribution costs."

Cigna, a health insurance company, used predictive modeling in its risk assessment system. Since the 1980s, the health risk assessment systems have gotten more sophisticated and have become widespread. Berry (2008) noted "Cigna unveiled a new health risk scoring system, linked to a health risk assessment questionnaire. The Trend Management System, as Cigna's system is known, defines 34 dangerous combinations that prompt online coaching and advice for patients to talk to their physicians with their risk assessment report in hand."

Cash management account systems combined "an investment account, a transaction account (that pays interest on balances through automatic sweep), a debit card, and a credit line secured by the securities in the investment account", cf. Manuel, Cappon and Mignot (2007). There was limited decision support. Modern CMA systems may include stock screening and portfolio management tools.

Time and technology have likely had a negative impact on how some of the above systems are perceived. Part of gaining advantage is maintaining the advantage. With software systems and applications that can be particularly difficult. At some point the software may need major upgrades and it may even need to be completely rewritten.

A major lesson learned from reviewing case studies is that a company needs to continually invest in a Strategic DSS to maintain any advantage.

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The journal INTERFACES in November-December 1983 had a number of DSS case studies that have since then become classics. For example, an article on the distribution of industrial gases at Air Products and Chemicals, the ASSESSOR pre-test market evaluation system, and Southern Railway's computer aided train dispatching system.

Power (2002) explored the question of gaining competitive advantage from DSS. Chapter 2 reviews examples of decision support systems that provided a competitive advantage including systems as Frito-Lay, L.L. Bean, Lockheed-Georgia, Wal-Mart and Mrs. Field's Cookies.

If a company is trying to develop a Decision Support System to gain a competitive advantage, managers and systems analysts should ask how the proposed DSS will affect company costs, customer and supplier relations and managerial effectiveness. Managers should also attempt to assess how the proposed strategic system will impact the structure of the industry and the behavior of competitors. These answers will provide some insight about whether gaining a competitive advantage is realistic.

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Author: Daniel Power

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