: Can decision support provide a competitive advantage?

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Some software vendors claim their decision support, analytics or business intelligence applications will provide a competitive advantage. This broad claim is made for decision support applications built using many technologies, including business intelligence tools, business performance management software, data mining tools, and quantitative models. Supposedly all organizations that implement a vendor's solution will gain a competitive advantage. This broad promise sounds too good to be true and it is **not** believable. Vendors need to temper claims using words like may, can, often or should. Exaggerated vendor technology optimism creates unrealistic expectations and in some cases contributes to technology cynicism. Computerized decision support, analytics and BI may and can create competitive advantage.

We have all heard and seen vendor claims like: "Gain Competitive Advantage from Business Intelligence and Ensure Sarbanes-Oxley Compliance," "With Data Mining, Achieve Competitive Advantage from the Data You Already Have!", "Executives See Business Intelligence Emerging as Crucial Competitive Advantage," "Use a DSS for Markdown Management and Competitive Advantage," and "XYZ Company Gains Competitive Advantage with Data Warehousing Solution". Some consultants alter the message to help sell their services, for example: "A data warehouse can be a competitive advantage dream or a costly nightmare." A more sophisticated vendor marketing message explains one way a firm can gain a competitive advantage -- "Data warehousing can provide a competitive advantage for organizations by increasing market share through analysis of customer profiles".

A study by Professor Tom Davenport, director of research for Babson Executive Education, reinforces the vendor hyperbole. According to DMReview.com Online News (April 29, 2005), Davenport states "The net takeaway of the study is this: The ability to make business decisions based on tightly focused, fact-based analysis is emerging as a measurable competitive edge in the global economy." Further Davenport said "Organizations that fail to invest in the proper analytic technologies will be unable to compete in a fact-based business environment." Davenport's conclusions are based upon interviews with 40 C-level executives and directors at 25 globally competitive organizations. Analytic technologies can provide organizations a competitive edge.

Managers want an "advantage", a superior capability, that enables better performance than competitors. An advantage can result in a better financial position, more resources and rewards, or other tangible or intangible benefits. An organization with an advantage has a capability, resource or skill demonstrably better than competitors. An advantage helps achieve favorable results when it is exploited competitively. Hoffman (2000) more formally defines a sustainable competitive advantage as "the prolonged benefit of implementing some unique value-creating strategy not simultaneously being implemented by any current or potential competitors along with the inability to duplicate the benefits of this strategy." A sustainable competitive advantage means an organization does something important much better than its competitors. In general, a competitive advantage is a capability or characteristic of an organization that significantly enhances success in a market, rivalry situation or encounter.

A firm can gain an advantage from having better information technology and better information resources. Most strategy researchers agree effective management and use of information is a valuable asset that can help gain a sustainable competitive advantage. In some situations, making better, faster, and more effective decisions can actually create "decision superiority".

Computerized decision support creates a competitive advantage when three criteria are met. First, once a decision support application is implemented it must become a major or significant strength or capability of the organization. Second, it must be unique and proprietary to the organization. Third, the advantage provided by the system must be sustainable for at least a few years to insure an adequate return on the investment. Even with rapid technology change a 3 year payback is a realistic goal. Managers who are searching for strategic investments in information technology for decision support need to keep these three criteria in mind. When computerized decision support is a valuable, rare, hard to imitate resource, it can provide advantage (cf., Barney, 1991).

Widespread usage of computing technology has changed the way companies do business. Information technology has altered relationships between companies and their suppliers and customers and even with their rivals. Porter and Millar (1985) discuss two specific ways that information technology can affect competition: by altering industry structures and by supporting cost and/or differentiation strategies. Michael Porter (1979) argued that the power of buyers, the power of suppliers, the threat of new entrants, the threat of substitute products, and rivalry among existing competitors determines the profitability of an industry. How a company uses information technology can affect each of the five competitive forces and can create the need and opportunity for change.

Information technology has altered the bargaining relationships between companies and their suppliers, channels, and buyers. Information systems can cross company boundaries. These inter-organizational systems have become common and in some instances they have changed the boundaries of industries. Specific decision support systems can reduce the power of buyers and/or suppliers. Sophisticated decision support systems can erect new barriers that reduce the threat of entrants. For example, data and the system for understanding it becomes a corporate asset that is hard to create for new entrants. Knowledge in a knowledge-driven DSS may only be obtained from experience in the industry. A specific DSS can help differentiate a product or improve service and hence reduce the threat from substitute products. Also, some DSS can help managers reduce the cost of rivalry actions by targeting expenditures and in some cases DSS may reduce the need for competitive actions and reactions.

How can data-driven DSS create an advantage? Using data can create advantages in many ways including improving customer relationships, identifying cost-cutting ideas, uncovering new business opportunities, improving reactions to changes in retail demand and optimizing selling prices.

Evans and Wurster (1997) argued in a Harvard Business Review article that the World is in the midst of a fundamental shift in the economics of information. They think major changes will occur in the structure of entire industries and in the ways companies compete. The change that they felt was so important is the widespread adoption of Internet technologies. Internet technologies have opened wide the possibilities for innovative web-based decision support systems. Inter-Organizational DSS can improve linkages with customers and suppliers. In some situations Group DSS and Groupware can remove time and location barriers. Specific DSS can help a firm operate seven days a week, 24 hours a day and without regard to an employee’s or a customer’s location. In some cases DSS can help integrate a firm’s operations. Also, inter-organizational, web-based DSS can create linkages with suppliers or customers that are difficult to overcome.

DSS can potentially help a firm create a cost advantage. DSS can provide many benefits including improving personal efficiency and reducing staff needs, expediting problem solving and increasing organizational control. Managers who want to create a cost advantage should search for situations where decision processes seem slow or tedious and where problems reoccur or solutions are delayed or unsatisfactory. In some cases DSS can reduce costs where decision-makers have high turnover and training is slow and cumbersome, and in situations where activities, departments and projects are poorly controlled.

Also, DSS can create a major cost advantage by increasing efficiency or eliminating value chain activities. For example, a bank or mortgage loan firm may reduce costs by using a new DSS to consolidate the number of steps and minimize the number of staff hours needed to approve loans. Technology breakthroughs can sometimes continue to lower process costs and rivals who imitate an innovative DSS may nullify or remove any advantage.

DSS can potentially create a differentiation advantage. Providing a DSS to customers can differentiate a product and possibly provide a new service. Differentiation increases profitability when the price premium charged is greater than any added costs associated with achieving the differentiation. Successful differentiation means a firm can charge a premium price, and/or sell more units, and/or increase buyer loyalty for service or repeat purchases. In some situations competitors can rapidly imitate the differentiation and then all competitors incur increased costs for implementing the DSS.

Finally, computerized decision support can be used to help a company better focus on a specific customer segment and hence gain an advantage in meeting that segment's needs. MIS and DSS can help track customers and DSS can make it easier to serve a specialized customer group with special services. Some customers won't pay a premium for targeted service or larger competitors also target specialized niches using their own DSS.

According to the resource-based view of firms (Barney, 1991), a sustainable competitive advantage is achieved by developing existing resources and creating new resources and capabilities in response to changing market conditions. Decision support systems often need to be renewed, recreated and/or created to develop a competitive advantage that results in superior value creation. DSS are traditionally associated with secondary value activities in a firm like resource management, purchasing or inventory management. Conceivably DSS can be embedded in many primary activities in a firm's value chain. Competitive advantage may come from or through faster learning, sustained innovation, reduced cycle times, improved sensitivity to market needs or from creating an innovative blend of technology and business practice.

Larry Greenfield (dwinfocenter.org) states "a firm that expects to get business intelligence, better decision making, closeness to its customers, and competitive advantage simply by plopping down a data warehouse is in for a surprise. Obtaining these next order benefits requires firms to figure out, usually by trial and error, how to change business practices to best use the data warehouse and then to change their business practices. And that can be harder than implementing a data warehouse."

So is computerized decision support, especially a data-driven DSS, a business necessity or do systems create a sustainable competitive advantage for some firms and not for others? Does sustainable competitive advantage result only from implementing a specific business strategy or can it result from creating resources like a specific, customized decision support system and then developing the capability to use the technology to improve decision making? Are inward focused DSS used by managers more likely to create an advantage than outward facing DSS for use by external stakeholders like customers? **Yes**, inward-focused DSS can create a sustainable competitive advantage for firms that create a unique, customized system and develop the capability to use the system. Outward facing DSS are more quickly imitated that inward focused systems, but either can potentially result in a sustainable competitive advantage. In general, a DSS must be continuously improved and enhanced to sustain any advantage from the system. Both specific decision support capabilities and the ability to use them must be periodically assessed and reviewed.

If a vendor sales representative claims you will gain a competitive advantage from buying her/his company's software, be skeptical, watch your wallet, and re-read this discussion of decision support and sustainable competitive advantage before buying the product. Make sure you understand the purpose of the proposed decision support capability, that you have a plan for creating the abilities and knowledge needed to effectively use the system, and that you know what it means to develop a sustainable competitive advantage.

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