ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 4, Issue, 04, pp.001-007, April, 2012

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

THE ROLE OF DATA IN STRATEGIC DECISION MAKING PROCESS

Stanley Kavale

Jomo Kenyatta University of Agriculture and Technology, Mombasa CBD Campus. Mombasa, Kenya

ARTICLE INFO

Article History:
Received 16th January, 2012
Received in revised form
18th February, 2012
Accepted 08th March, 2012
Published online 30th April, 2012

Key words:
Role of data,
Strategic decision making process,
Type of paper,
Research Paper.

ABSTRACT

This paper explores the role of data on the strategic decision making process. This is a desk top research study which looked at different studies done by researchers on the role of data and its role in strategic decision making. The main objective of this study is to establish the roles data play in strategic decision making. The strategic decision making process has also been identified and the theories underlying strategic decision making process have been explored. First it looked at the definition of data in relation to information and knowledge. Sources of data, both internal and external have been identified and theories of decision making; rational, incremental, political, constructive and factual approach illustrated. From the study, it is quite clear that data has very important roles in strategic decision making. This paper concludes that data plays the roles of; gaining competitive advantage, optimization of resources, cost reduction, value creation, accuracy and accountability and hedging uncertainty. Thus data brings efficiency and effectiveness in the strategic decision making process. This paper recommends that management in organizations should attach a lot of importance to data sourcing, analysis, interpretation and use to create competitive advantage. Further, data security should be enhanced because data is a key resource.

INTRODUCTION

The concept of strategic data based decision making is the use of robust data and intelligence to underpin a company's decisions. This is in contrast to intuition-based or 'gut-based' decision making, where decisions are based on unfounded beliefs of the business and its external environment. A data-based approach to strategic decision making is one commonly advocated strategy for increasing efficiency and competitiveness and meeting external demands for accountability. Data-based strategic decision making is the thorough collection and objective analysis of data to make decisions (Lassen, 2007). Over the last few years, resources for management information have increased with the change of the internet from mainly a research-oriented system to one that has additionally become a source of relevant information also for a business audience by its diverse content. Because of these developments, the question is no longer whether some required bit of information is available, but where this item can be found in the shortest time. More importantly, what role will that data play in enhancing effective and efficient strategic decision making?. Also, new methods have become available for the task of collecting information in each step of the strategic decision-making process such as preparing for a case, constructing, documenting and comparing alternatives, thus enabling faster and more comfortable choices (Choo, 2002). Decisions taken by executives of large corporations are mostly of a strategic nature; they are complex, non-routine, cannot be solved easily by existing procedures and may have not previously been encountered in the same form. The strategic issues that are the subject of the decisions are similarly combative and can be summarized as affecting the long-term direction of the organization and involving considerable change such as strategy development and execution, mergers and acquisitions, large investments and organizational changes (Van Riel *et al*., 2003). Data based strategic decision making promotes accountability are part of a rational, linear approach to strategic decision making, in which organizations set clear goals, collect all the information needed to objectively analyze all the possible alternative strategies to reach those goals, choose the strategy that maximizes their chances of success, and then gather more data during implementation to measure their progress and refine the strategy (Chaffee, 1985). Otherwise, Miller, Hickson and Wilson (2002) indicate that decision-making is important because it is crucial to the comprehension of how and why organizations come to be what they are and to control what they do. Organizations need decisions to be made in order that they can function effectively. The major purpose of this study is to explain the role of data when making strategic decisions in firms. It also seeks to identify the strategic decision making process. The theories underlying strategic decision making process is also be explored.

Corresponding author: stanok8@gmail.com

Data, Information, Knowledge and Strategic Decision Making

What is the difference between data, information and knowledge? Consider a document containing a table of

numbers indicating product sales for the quarter. As they stand, these numbers are Data. An employee reads these numbers, recognizes the name and nature of the product, and notices that the numbers are below last year's figures, indicating a downward trend. The data has become Information. The employee considers possible explanations for the product decline (perhaps using additional information and personal judgment), and comes to the conclusion that the product is no longer attractive to its customers. This new belief, derived from reasoning and reflection, is Knowledge. Thus, information is data given context, and endowed with meaning and significance. Knowledge is information that is transformed through reasoning and reflection into beliefs, concepts, and mental models (Fahey and Prusak 1998).

Information is something that changes the state of its recipient or, more specifically, the knowledge state. A slight variation is to say that information is what determines a decision or allows a choice to be made. Making a decision represents a change of state (from undecided to decided) on the part of the decision maker (Meadow & Yuan, 1997). It is a message understood by the recipient and which changes that person's knowledge base (Choo, 2002). Knowledge generally is based on information. This raises the question of how the upgrading of information to knowledge has been achieved in the industrial environment. Van Riel *et al*. (2003) call the development of rational knowledge a deductive and analytical logical process. The decision-maker follows a series of predetermined and communicable steps that transform given external or internal information according to these rules of logic. Reasoning is thus seen as the processing of selected cognitive content, using the logic of causality: an intentional, constructive, rule-based and conscious activity. The building blocks of this analytical or rational knowledge are pieces of information or judgments.
Strategic decision-making has been described as a dynamic capability in which managers pool their various businesses, functional, and personal expertise to make the choices that shape the major strategic moves of the firm. Mintzberg and Theoret (1976) define a decision as a specific commitment to action, usually a commitment of resources and a decision process as a set of actions and dynamic factors that begins with the identification of a stimulus for action and ends with the specific commitment to action.

Sources of Data

Fact-based decision making encompasses data gathered both internally and externally to a company and both are complementary. Figure 1 below highlights the main sources of intelligence from a company's external environment, with the key sources being competitors and customers. Competitors usually hold the greatest value because they are firms that, by definition, serve similar customers with a similar offering and represent the greatest threat to a business. For fact-based decision making to be truly effective, it is imperative that companies have access to the most relevant and granular quality information; enabling an understanding of not only what competitors and customers have been doing in the past but also what they are doing now and what their plans are for the future. Whether sources are external or internal, care is to be taken so that only data that is relevant, timely and accurate is considered (Brenner, 2005).

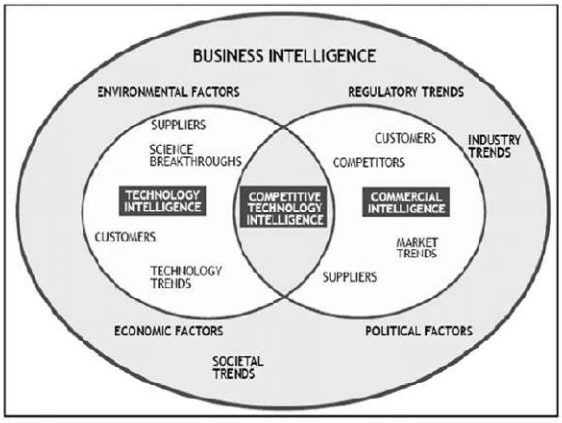

Fig I: Sources of business intelligence (Brenner, 2005)

The Process of Strategic Decision Making

Many studies in strategic management take the position that executives reach strategic decisions after a structured process of careful consideration of circumstances, alternatives and consequences. Information on matters such as competition, markets, technologies and the societal environment affecting the organization specifies the implications of the feasible alternatives for the decision to be made and plays a crucial role in obtaining the parameters of these alternatives. Making decisions presupposes that adequate information is available that enables an executive director or a board of directors to reach the best possible decision under the circumstance (Hammond, Keeney and Raiffa, 2006). The strategic decision making process is a seven step engagement that starts with problem definition, criteria definition and generation of alternatives, evaluation of alternatives, choice of the best alternative, implementation of the chosen alternative and follow up. The strategic decision process (on average) takes the above indicated steps. This process is affected by amount, accuracy and reliability of data, both the internal and the external the environmental factors; key of it being the available resources since strategic decision making is a long term plan. Others include the level of education, risk propensity, size of firm and the level of aggressiveness.

Theories of Decision Making

Several models have been put forward to explain the decision making theory when faced with alternatives. They are the rational choice theory, incremental theory, political theory, constructive theory and the factual approach.

Theories of Rational Choice

The rational choice model assumes that decision makers have clear goals, have all the data they need to analyze multiple alternatives, and that they desire to maximize the effectiveness of their institution by making the optimum choice (Eisenhardt & Zbaracki, 1992). In particular, linear strategy models call for organizations to set out broad strategic goals and to operationalize them by making decisions - about budg*et al*location and personnel, for instance - that are in tune with those objectives (Pisel, 2008). SWOT (strengths, weaknesses, opportunities and threats) analysis is one example of a tool that can be used in this approach. This tool requires an

institution to gather information internally about its strengths and weaknesses and to scan the external environment for data about threats and opportunities, and then objectively assess how competitive it is given these factors. The goal is to use rational analysis of data to improve the institution's position by matching strengths to opportunities and by protecting it from internal weaknesses and external threats (Trainer, 2004).

Theories of Incremental Decision Making

Hammond *et al*., (2006) is Lindblom's (1979) argument that the human brain does not have the processing capability to optimize choice among multiple alternatives. His model of incremental decision making posits instead that leaders tend to consider just a few options that differ only slightly from the status quo, simplifying the process considerably. Some scholars have argued that incremental decision making is particularly appropriate for explaining the behavior of organizations whose goals are unclear (Tarter & Hoy, 1998). The incremental model is helpful when there is disagreement within an institution over the methods used to pursue certain objectives (Bulger, 2003). Whether an organization faces uncertainty about means or ends, it may be easier for its leaders to agree to modify current policies rather than consider decisions that could bring major change. Of even greater significance, minimizing the number of alternatives considered greatly reduces the amount of data that must be gathered and analyzed before making a decision. This helps harried decision makers to "muddle through" when there is not enough time for all the steps called for in the rational choice model (Tarter & Hoy, 1998). Current arguments are that the incremental approach is likely to become more common as environmental dynamism, turbulence and unpredictability increases (Sellers, 2005).

Political Theories of Decision Making

This theory argues that multiple individuals and groups within an organization are involved in making choices and that their interests, values, and goals will often conflict (Mignot-Gerard, 2003). In this model, decisions are the product of bargaining and competition among these actors with varying levels of power, rather than an optimization calculation (Tarter & Hoy, 1998). Information is a tool in a competition for power instead of evidence to help make an objective judgment (Dean & Sharfman, 1996). Those without information will engage in political tactics - such as forming alliances or spying - to acquire it (Taylor, 1990). Actors may look only for evidence that supports their own position or undermines their adversaries' and once gained they may hide, manipulate, or release it selectively to influence decisions. The Advocacy Coalition Framework captures this reality that people in different coalitions will interpret the same piece of evidence quite differently, leading to suspicion regarding the motives of the 'perverse' interpretation of evidence by opponents. Competing actors, therefore, may seek the control of data gathering, analysis, and dissemination channels to establish their view as the dominant one (Narayanan & Fahey 1982).

Constructivist Theories of Decision Making

Constructivist decision making theories represent another alternative to the rational choice model. Constructivist theories posit that reality is socially constructed. This occurs through a process of dialogue, which is shaped by the experiences and world views of the decision makers and the context in which they operate (Dutton, 1993). Understanding humans, in other words, may explain as much about decision making as understanding data (Dowd, 2005). Constructivist theories, in contrast, argue that decisions to act can precede analysis when a situation is so uncertain that passively.

The Factual Approach to Strategic Decision Making

This model certifies that effective decisions are based on the analysis of data and information. The key benefit is informed decisions - an increased ability to demonstrate the effectiveness of past decisions through reference to factual records. Increased ability to review, challenge and change opinions and decisions is key. Applying the principle of factual approach to decision making typically leads to ensuring that data and information are sufficiently accurate and reliable, making data accessible to those who need it, analysing data and information using valid methods and making decisions and taking action based on factual analysis, balanced with experience and intuition (Bulger, 2003).

Decision-Making Step	*Rational Decision Making*	*Bounded Rationality*
Problem definition	Real problem is identified	Problem primarily reflects the decision maker's interests, understanding, and needs
Criteria definition	All relevant criteria are identified and weighted appropriately	Limited criteria are identified, and evaluation is influenced by self-interest
Alternative generation and evaluation	All options are considered, and all consequences are understood and taken into consideration	Limited options are identified, favored option is given priority, and consideration halts when a "good enough" solution is found
Implementation	All participants understand and support the solution	Politics, power, and self-interest influence the amount of acceptance and commitment to the solution

Figure 4. Model comparing rational decision-making versus bounde (Williams, 2002, p.15)

Fig II: Decision Making Process in relation to rationality (Tarter & Hoy 1998)

ROLE OF DATA IN STRATEGIC DECISION MAKING

The ability to make quick, well-informed decisions is critical to competitiveness and growth for small and large companies alike. In recent years, most companies have seen the amount of customer and company data in legacy systems, desktops, servers and intranets increase dramatically. Yet a lack of integration between systems makes it nearly impossible for companies to use the valuable data within disparate systems to their advantage. In many cases, instead of relying on hard data based on historical trends to drive strategic direction, decision makers rely heavily on experience, limited - sometimes outdated - information and intuition. The following roles of data in the strategic planning process are evident in most scholarly work;

Role in Optimizing Decision Processes

Using integrated, coherent views of data is essential as it is synonymous to making strategic decisions based on hard facts. For example, to evaluate factors driving sales across products, regions and time frames, decision makers need facts to

analyze the sales process. Once data is available, integrated and accurate, the decision processes are optimized so that it is fast and spends fewer resources. Optimum resource utilization is facilitated by informed choices. It is this quality of data that optimizes the strategic decision making process (Hammond *et al*, 2006).

Role in Improving Regulatory Compliance

Astute organizations compile data from across the business to achieve a single version of the truth to help improve the ability to comply with government regulations. Data guides the decision makers when they are complying with statutory and regulatory bodies. It sets the standards to be followed to keep within legal and regulatory frameworks.

Role in Helping Decisions Become More Nimble

To optimize opportunities, businesses often need to make quick, calculated decisions. Many of today's most successful organizations rely on a data warehouse to provide them with critical information such as cash position, product and customer profitability, and even insight into products that are likely to be purchased together. Data warehouses offer competitively priced data solutions designed to help companies of all sizes analyze and use information to make better decisions. Such data warehouses form foundations and make decisions that enables firms to easily build solutions that integrate data, so employees can make decisions based on complete, near-real-time data without burdening the IT team or breaking the bank! This leaves firms more astitute and nimble since they use reliable data (Dowd, 2005).

Role in Gaining Competitive Advantage

Data based strategic decision making brings a competitive edge which in turn leads to leverage. Failure to make the right decisions may result in loss of competitive advantage, loss of market share and a decline in profitability. It is critical that companies and individuals involved in business and strategic planning have access to the best possible intelligence about the external environment they operate in. By better understanding their markets, customers and competitors, companies can better place themselves to develop the right strategies and ultimately outperform their peers. Underpinning the development of successful strategies is an understanding of the marketplace, identifying markets that represent opportunities for companies and positioning the business (internally and externally) to take advantage of these opportunities. Conversely, as strategy is about optimizing the use of finite resources, a company will also need to identify which markets to avoid and exit in order to maximize the return on its investments and assets. Choo, (2002) calls this 'environmental scanning'. "The organisation that has developed early insight on how the industry and markets are moving will have a competitive edge. Unfortunately, messages and signals about events and trends in the environment are ambiguous and are subject to multiple interpretations. As a result, a crucial task of management is to discern the most significant changes, interpret their meaning, and develop appropriate responses. It this rare quality data that gives a firm a competitive edge (Porter, 1980).

Role in Reducing Costs

By using reliable data, firms have been able to remove and or reduce bottlenecks in the strategic decision making process. This facilitates in the allocation of scarce resources hence use the resources properly thus reducing costs associated with inefficiency. Costs associated with forgone choices (opportunity costs), are also reduced.

Role in Reduction of Uncertainty or Risks

In situations of great uncertainty, reliable data may be scarce. The rationalist approach seeks to erase that uncertainty because it assumes that good decisions rest upon a well-informed understanding of what is happening. This understanding is gained through thorough data collection and objective analysis of the data. This data clears the benefit of doubt and the resultant confidence is a motivation for success (Trainer,2004).

Role in Adding Value to Existing Products or Services

Data is a source of power. This power, when used properly leads to branding. Branding, when well managed leads to positioning; the psychological placement of products and services in the minds of customers. This whole process creates new value through information bases existing products and services (Porter, 1980).

Role in Identifying the Right Decisions

Decision making is about picking the best alternative faced with choices. Data helps in the evaluation of alternatives so that the best practical alternative is adopted. A business' performance is fundamentally linked to its ability to make the right decisions, whether it relates to developing new products, entering and exiting markets, making acquisitions and disposals, or prioritizing and executing performance improvement initiatives (Lassen, 2007).

Role in Support Entry into New Markets

Astute firms need to identify the most attractive markets for them to target as well as the best market entry model to employ. This may require an assessment framework for each market segment by understanding the market size, growth and profit potential as well as key drivers and trends. This data provides insight into the critical success factors required to enter and compete in each of the markets. This enables the assessment of competitors and capabilities to understand how affirm is positioned relative to the rest of the industry.

Role in Developing New Proposition

Data enables decision makers to develop stronger prepositions based on robust insights. Across many industries, shifts in technology and changes in the regulatory landscape are lowering the barriers to entry and creating new opportunities as well as threats for companies. Together with the emergence of new business models, customer behavior is also evolving; the way they choose, the way they buy, what it takes to gain their loyalty. All this results in an increasingly complex and dynamic environment for companies to operate in.

Companies no longer compete with the regional players and marketplaces have become global. Customers now source goods and services from around the world and will only buy from those that can best address their needs, not just from those who are closest to them. There may be nothing new here, but these shifts are happening all the time and this is yet another issue that successful companies must understand and tackle. The recent global downturn has added yet a further need for fact-based decision making. Companies and investors now place less emphasis on past performance as a guide for the future. This suggests that, particularly in the current climate, companies need to understand the new reality and how best to react to the present and plan for the future. The increasing dynamics within markets and industries also means that there are now more opportunities for companies to grow, whether they seek to do so by launching new products, targeting new customer groups, developing new propositions or expanding into new geographies. The winners will be those who identify such opportunities and position themselves to take full advantage (Fahey and Prusak 1998).

Role in Maximization of the Utility of the Organization

Information is central to the rational choice model. Dean and Sharfman (1993), in fact, define rationality as the gathering and analysis of data to make decisions. This perspective assumes that information, interpreted objectively, will lead to choices that maximize the utility of an organization. Gayawali, Stewart and Grant (1997) argue that the availability of quality data can lead to organizational learning, which in turn yields better decisions. In contrast, a lack of data hinders decision making. Proper use of available data facilitates maximization of company resources.

Role in Timeliness and Accuracy of Decisions

Howard (2001) asserts that the goal is to "…reduce the decision maker's uncertainty…" . Similarly, Seybert (1991) sees the job of research as improving decision making by supplying timely and accurate data. Although Pisel (2008) acknowledges that some uncertainty is to be expected, he argues that a rational strategic planning process can deal with this by making assumptions. However, such assumptions should be as few as possible and be logical and grounded in reality. Data based strategic decision making seems to be more founded on reality, accuracy and timeliness.

Role in Organizing, Sensing and Diagnosing Problems

Data helps organizations to sense problems in its environment, diagnose the causes, judge the potential solutions, and then assess the effectiveness of decisions. The rationalist emphasis on gathering and objectively interpreting information is anchored in scientific, positivist modes of thinking. Sanderson (2003) explains that this approach has its origin in enlightenment perspectives. This quality of data is like an oil measuring stick. It detects when the oil level is past a given threshold.

Role in Accountability

Demands for accountability by stake holders leaves strategic decision makers with no option apart from using data to increase the accuracy of those decisions. (Bailey & Alfonso, 2005). Romero *et al*., (2005), in advocating on a culture of evidence argue that decisions based on data should replace those grounded in politics, favoritism, guesswork, or anecdotal information. Fitzgibbon (2003) asserts, "…if our intuitions were accurate we would scarcely need research, we will have every thing we have to make decisions. Accounting for them would be so easy. This is as a result of thorough feed back mechanism instituted by key stake holders for decision makers to account for every bit of decision they make and implement.

Role in Quality Decisions

The quality of the process of strategic decision-making is contingent on the quality of the supporting information. Quality is often considered to be a subjective attribute, but as shown by the International Organization for Standardization (ISO, 2008) it can indeed be quantified. Pirsig (1974) phrases this as "the whole purpose of scientific method is to make valid distinctions between the false and the true…., to eliminate the subjective, the unreal, imaginary elements from one's work so as to obtain an objective, true picture of reality. When one says that 'Quality' is merely subjective, this implies that quality is imaginary and can therefore be disregarded in any serious consideration of reality". But quality is also a way of defining conformance to specifications and in this way, quality does become a concrete, measurable quantity. This, to a very greater extend, is a key role of data.

Role in Economic Development

The Australian Library and Information Association (1996), advocates the development of an informed society that can partake and participate in skilled decision-making. Accurate, relevant and timely information is the key ingredient to effective decision-making. Australia's long-term economic development is dependent on its ability to use information to make decisions that enable growth, progress and productivity. The library profession contributes to an informed society by acquiring, organising, archiving, retrieving, using, synthesising and analysing information and thereby empowering users so that they can utilise this information in their strategic decision-making processes. This is associated with empowered strategic decision makers who make sound, rational and economically viable decisions. This increases the welfare of both the decision makers and all other stakeholders.

Role in Information Management

The flow of information within companies is regulated by procedures for information management. In some cases, this implies a system for knowledge management. The procedure for serving the company Board with information is part of these procedures. Some companies outsource the searching for information to specialized information services companies, but a comment was that "this is sometimes not effective when the questions and issues cannot be made explicit and unequivocal. This would result in an overload of irrelevant information". Thus data assists in information management in the organization (Seybet, 1991).

Role in Management of Change

Changes in the environment have brought changes in the way information is used in companies. In some instances,

environmental forces compel firms to change a decision course. How do firms change an already popular decision? It is not simple, with limited resources. However, data assists in making the changes, could be by accepting and implementing an alternative but feasible choice. Generally, the whole process of change in organizations is a key strategic decision adventure (Johnson, Scholes & Whittington (2005).

Role in the Autonomy of Decision Makers

If strategic decision makers are not free to make and own decisions, thus have to follow head office orders or report back to head office before a decision can take effect, there is less 'strategic value' involved. In most cases however, head office directives leaves sufficient freedom to local executives so that a local decision with strategic significance is still needed. The decision makers get authority from the amount of reliable data in hand. Where key data is in short fall, uncertainty reigns and decision making is delayed (Trainer, 2004).

CONCLUSIONS

From the study, it is clear that strategic decision-makers must have a reasonably accurate and complete mental image in a business process and its interfaces with the world in order to be able to make strategic decisions effectively, efficiently and exert control over the process. This paper concludes that;

1. Data plays key roles in the strategic decision making. These roles include gaining competitive advantage, optimization in use of resources, reduction in costs, value creation, hedging uncertainly, accuracy and accountability. Data also help in management of change and quality decision making. In summary, data has a key role creating efficiency and effectiveness in strategic decision making processes.
2. The ability to make quick, well informed decisions is critical to competitiveness and growth for small and large firms alike.
3. Strategic decision making (on average) is a series of steps which are crucial and which have to be followed religiously to come up with sound rational decisions.
4. The strategic decision maker's behavior can be explained by the theories underlying strategic decision making theories which are: rational choice theory, incremental theory, political theory, constructive theory and the factual approach.

RECOMMENDATIONS

This paper recommends that the management in organizations should attach a lot of importance to data sourcing, analysis, interpretation and use in strategic decision making. The management must make sure that the correct, timely and accurate data is used in strategic decision making to generate the ever elusive competitive advantage. Further, due to its key roles, data is a strategic resource. Therefore, data security should be enhanced at all levels of strategic decision making to avoid access by unauthorized person(s).

REFERENCES

Australian Library and Information Ass. (1996). Policy Statement on Information as a Commodity and its Importance to Economic Development. Retrieved from www.alia.org.au/policies/information.commodity.html.August 2011.

Bailey, T. & Alfonso, M. (2005). Paths to Persistence: An Analysis of Research on Program Effectiveness at Community Colleges. Indianapolis, IN: Lumina Foundation for Education.

Brenner, M. (2005). Technology Intelligence at Air Products: Leveraging Analysis and Collection Techniques. Competitive Intelligence Magazine, 8(3).

Bulger, S. R. (2003). A Grounded Theory of Decision-Making Processes in United States Postsecondary Distance Education Program Development (University of Michigan).

Carrington, K. (2003). Decision making, Open Systems and Nonequilibrium. In J.Rabin (ed.), Encyclopedia of Public Administration and Public Policy. London: Dekker.

Chaffee, E. (1985). Three Models of Strategy. Academy of Management Review, 10(1).

Choo, C.W. (2006) The Knowing Organization. How Organizations use Information to Construct Meaning, Create Knowledge, and Make Decisions. New York: Oxford University Press.

Dean, J.W. & Sharfman, M.P. (1996). Does Decision Process Matter? A Study of Strategic Decision-Making Effectiveness. Academy of management J., 39(2).

Dowd, A. (2005). Data Don't Drive: Building a Practitioner-Driven Culture of Inquiry to Assess Community College Performance. Indianapolis, IN: Lumina Foundation for Education.

Dutton, J. E. (1993). Interpretations on Automatic: A Different View of Strategic Issue Diagnosis. Journal of Management Studies, 30(3).

Eisenhardt, K.M. & Zbaracki, M.J. (1992). Strategic Decision Making. Strategic Management Journal, 13 (Special issue, Winter 1992).

Fahey, L. & Prusak, L. (1998). The Eleven Deadliest Sins of Knowledge Management. California Management Review, 40(3).

Fitzgibbon, C. T. (2003). Milestones En - Route to Evidence-Based Policies. Research Papers in Education, 18(4).

Fusch, D. (2010). Business Intelligence: Making Data Reporting More Effective. Higher Ed Impact: Weekly Analysis from Academic Impressions, Retd. Agust 17, 2010.

Gayawali, D. R., Stewart, A. C., & Grant, J. H. (1997). Creation and Utilization of Organizational Knowledge: An Empirical Study of the Roles of organizational Learning on Strategic Decision Making. Academy of Management 16-20.

Hammond, J., Keeney, R., & Raiffa, H. (2006). The Hidden Traps in Decision Making. Harvard Business Review, 84(1).

Howard, R. D. (2001). Conceptual Models for Creating Useful Decision Support. New Directions for Institutional Research, Winter 2001(112).

Hussey, D. (1997) The Strategic Decision Challenge. John Wiley & Sons.

International Organization for Standardization (2008). ISO Management Standards.

Johnson, G., Scholes, K., & Whittington, R. (2005) Exploring Corporate Strategy. Harlow, UK: FT Prentice Hall.

Lassen, M. M. (2007). Massachusetts community colleges: The potential for improving college attainment. Boston, MA: The Boston Foundation.

Meadow, C. & Yuan, W. (1997). Measuring the Impact of Information: Defining the Concepts. Information Processing & Management, 33(6).

Mignot-Gerard, S. (2003). "Leadership" and "Governance" in the Analysis of University Organizations: Two Concepts in Need of De-construction. Higher Education Management & Policy, 15(2).

Miller, S.J., Hickson, D.J., & Wilson, D.C. (2002). Decision-Making in Organizations. In G.Salaman (ed.), Decision Making for Business. London: SAGE Publications.

Mintzberg, H., Raisinghani, D., & Theoret, A. (1976). The Structure of "Unstructured" Decision Processes. Administrative Science Quarterly, 21(2).

Mohammed, M.A. (2004), "Using Statistical Process Control to Improve the Quality of Health care", Quality and Safety in Health Care, Vol. 13.

Molloy, S. & Schwenk, C. (1995). The Effects of Information Technology on Strategic Decision Making. Journal of Management Studies, 32(3).

Narayanan, V. K., & Fahey, L. (1982). The Micro-Politics of Strategy Formulation.

Pirsig, R.M. (1974) Zen and the art of Motorcycle Maintenance. Academy of Management Review, 7(1).

Pisel, K. (2008). A Strategic Planning Process Model for Distance Education. Online Journal of Distance Learning Administration, 11(2) Ret. August 4, 2011, from http://www.westga.edu/~distance/ojdla/summer112/pisel112.html.

Porter, M.E. (1985) Competitive Advantage; Creating and Sustaining Superior Performance. NY: Free Press.

Romero, M., Purdy, L., Rodriquez, L., & Richards, S. (2005). Research Needs and Practices of Community-College Practitioners. Community College Journal of Research and Practice, 29(4).

Sanderson, I. (2003). Is it 'What Works' that Matters? Evaluation and Evidence-Based Policy-Making. Research Papers in Education, 18(4).

Sellers, M. (2005). Moogle, Google, and Garbage Cans: The Impact of Technology on Decision Making. International Journal of Leadership in Education, 8(4).

Seybert, J. A. (1991). The Role of Institutional Research in College Management. School Organization, 11(2).

Simon, H.A. (2007). A Behavioral Model of Rational Choice. Quarterly Journal of Economics, 69(1).

Simpson, C.W. & Prusak, L. (1995). Troubles with Information Overload--Moving from Quantity to Quality in Information Provision. International Journal of Information Management, 15(6).

Tarter, J. C., & Hoy, W. K. (1998). Toward a Contingency Theory of Decision Making. Journal of Educational Administration, 36(3).

Taylor, R. N. (1990). Strategic Decision Making. In M. D. Dunnette, & L. M. Hough (Eds.), Handbook of Industrial and Organizational Psychology (3rd ed.). Palo Alto, California: Consulting Psychologists Press.

Trainer, J. F. (2004). Models and tools for Strategic Planning. New Directions for Institutional Research, 2004(123).

Van Riel, A., Ouwersloot, H., & Lemmink, J. (2003). Antecedents of Effective Decision Making: A Cognitive Approach (Rep. No. 2003/045). Maastricht, The Netherlands: Research School of Economics of Technology & Organization.

Williams, S. (2002) Making Better Business Decisions. US: Thousand Oaks.

****