

Perceived environmental change as a determinant of managerial information seeking behavior

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ABSTRACT

Environmental scanning is a necessary component of the strategic management process. Several prior studies have examined aspects of purposeful information search behavior related to the business environment because it is deemed to be a necessary component of the formulation of business policy and strategy. This study used a sample of managers in the credit union industry to assess how the managers' information search behavior related to various environmental sectors was affected by their perceived rate of change in those sectors. The study measured the managers' use of five different types of information sources related to each of six environmental sectors. The five types of information sources included internal and external personal and written sources and the use of the Internet in their environmental scanning behavior. The six sectors were equally divided between the task and general environments. The hypothesized positive relationship between perceived sector importance and search behavior, measured by the frequency of information source usage, was supported for sectors related to the general environment, but not for sectors related to the task environment.

Keywords: Strategy, Environmental Sector Uncertainty, Environmental Sector Rate of Change, Environmental Sector Scanning

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INTRODUCTION

The common normative model of the strategic management process describes an ongoing proactive process where management personnel assess the environment and, when necessary, modify an organization's operations to better accommodate perceived environmental changes in order to improve the chances of reaching strategic objectives (Aguilar, 1967; Hambrick, 1982). This process may be affected by the degree individual managers perceive environmental changes as potentially beneficial or threatening to the organization. One such perception is the rate of change in a particular element of the environment. Higher rates of change could foster increased managerial uncertainty which would, in turn, result in higher levels of information seeking behavior in an attempt to reduce that uncertainty (Daft, Sormunen & Parks, 1988; Nadkarni & Barr, 2008; Forbes, 2007). The present study tests how the degree managers' information seeking behavior involved in scanning and assessing the environment, using a variety of information sources, is related to their perception of the rate of change in individual environmental sectors.

Many previous studies aggregated perceived environmental sector importance with perceived environmental sector complexity and environmental sector rate of change into the single latent predictor variable, perceived strategic uncertainty. The present study focuses on the more direct relationship between perceived environmental sector rate of change and scanning frequency and, in doing so, avoids some of the methodological problems involved combining observed variables into a single calculated latent variable. Using this methodology, the relationship between perceived sector rate of change and scanning frequency for five information sources was measured in six environmental sectors encompassing both the task environment and general environment.

LITERATURE REVIEW AND HYPOTHESES

Organizations operate in dynamic environments. This dynamism has been described as the "velocity" of the environment consisting of the direction and rate of change in the various environmental sectors (Bourgeois & Eisenhardt, 1988). Initially, the description of industry velocity has been somewhat coarse with industries typically being described as "low", "medium" or "high" based on an aggregation of velocities in the environmental sectors affecting the industry (McCarthy, Lawrence, Wixted & Gordon, 2010). McCarthy et al. (2010) suggest a much more nuanced framework for describing environmental velocity that considers how velocity varies across environmental dimensions such as technology, products, demand, regulatory requirements and competitive activity and how the velocity of the various dimensions are causally linked.

Regardless of how the velocity or rate of change of elements in a task or general environment can be defined, organizational leaders will likely base their responses to changes in the environment based on their perceptions of those changes. Realistically, the process of scanning and interpreting the information that is derived from the process is subject to certain individual and organizational resource limitations. Organizations may or may not have organizational structures in place to closely monitor and assess changes in their industry's environment. A large public company may be involved in several industries simultaneously

which complicates the task of environmental assessment. Organizational leaders have individual limitations of time and cognitive ability as to the quantity and scope of information they can monitor (Cho & Hambrick, 2006; Cyert & March, 1963). Bogner & Barr (2000) describe cognitive frameworks that develop during the process of sensemaking (Daft & Weick, 1984) as managers interpret their environment from information gathered during scanning and then act based on their interpretations. Managers develop these frameworks based on past experiences with events and interactions with the environment, and then use these frameworks as an interpretive tool to make sense of current and anticipated future changes in the environment and to decide what actions are appropriate responses to them (Reger & Palmer, 1996). As such, these frameworks that are developed are subject to the cognitive biases and values of the members of the dominant coalition in the organization (Hambrick & Mason, 1984), the degree that managers perceive that alternatives can be developed for cognitive frameworks that are controllable (March & Shapira, 1987) and the extent that management judges that they fit the social economic and cultural structures of the organization (Ocasio, 1997). The utility of these frameworks diminish as changes in the competitive environment become more frequent (Nadkarni & Barr, 2008). As a result, managers have to devote more time to more frequent changes in order to develop new cognitive frameworks that are relevant to the new environmental realities. In addition, sustained exposure to high rates of change can not only increase managerial attention, but can also bring about structural changes in the more successful organizations due in part to changes in the financial incentives offered to executives (Cho & Hambrick, 2006). These organizational changes often result in less structural rigidity which, in turn, potentially allows increased awareness of environmental change (Brown & Eisenhardt, 1997). Therefore, the relationship between scanning and performance may not always be a direct one, but rather may often be mediated by the overlapping activities involved with sensemaking, organizational configuration and decision-making processes (Narayanan, Zane & Kemmerer, 2011).

Other organizational level factors can also affect scanning behavior. Daft & Weick, (1984) suggested that many organizations have developed a culture of passive acceptance of environmental change, do not promote ongoing scanning efforts and actively seek information on its environment only in response to a crisis. In addition, managers within an organization tend to share a higher level of commonality of views regarding their environment than they do with their counterparts in other organizations which suggests that institutional forces tend to exert an internal isomorphic effect with respect to directing scanning efforts (Sutcliffe & Huber, 1998). These forces can tend to underemphasize information obtained from scanning that reflects negatively on current operations, strategies and organizational leaders

A presumption of the relationship between scanning and organizational performance is that it is a significantly positive one. There is empirical support for that presumption. Daft et al. (1988) found executives in higher performing firms scan the environment more frequently and tailor their scanning to the degree of perceived strategic uncertainty better than CEOs in lower performing firms. In addition, CEOs in higher performing firms used more types of information sources than their counterparts in lower performing firms. More recent studies have reported results consistently supporting a relationship between scanning and performance. In a study of single industry manufacturing firms Danneels (2008) found significant positive relationships between scanning activity and development of second order competencies in marketing and research and development. He used frequency of participation by employees at trade shows, conferences and professional association activities together with frequency of contact with members of the scientific and research community and reading of specialized journals and

magazines as measures of scanning activity. Higher performing organizations may also develop organizational competencies specifically designed to address rapidly changing environments such as the ability to rapidly acquire knowledge through the development of professional networks and through collaboration once those networks are established (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997).

Perceived Strategic Uncertainty Studies Related to Environmental Scanning

Several studies have been conducted using a latent variable, perceived strategic uncertainty, to reflect the uncertainty based motivation for environmental scanning conducted by managers. Daft, Sormunen & Parks (1988) defined rate of change as ...“the frequency of changes that occur in the organization’s environment (p. 125).” While they correctly point out that the importance, complexity and frequency of the environmental changes that potentially affect an organization may individually or jointly affect the scanning behavior of company executives, separating the effects of these factors has not been emphasized in prior research. Many prior researchers (e.g. Daft et al., 1988; Sawyerr, 1993; Elenkov, 1994; May, Stewart & Sweo, 2000) have tested relationships between “perceived strategic uncertainty” and scanning behavior. In these studies, the latent predictor variable “perceived strategic uncertainty” was comprised of three individual predictor variables (i.e. perceived rate of environmental change, perceived level of environmental complexity and the level of importance in obtaining the organizational goals). Perceived strategic uncertainty in these studies was calculated as follows (Daft et al., 1988:130):

$$PSU = I(C + R).$$

Where

PSU= Perceived Strategic Uncertainty

I = Perceived Sector Importance

C=Perceived Sector Complexity

R=Perceived Sector Rate of Change

Two criterion variables were designated in the Daft et al., (1988) model and in multiple subsequent studies: CEO scanning frequency and CEO scanning mode (i.e. the use of verbal or written information from personal or impersonal sources). The modes of scanning were categorized along the dimension of written versus verbal, and the dimension of internal versus external. The criterion variable results between high and low performing firms in the same industry were also compared on an industry-by-industry basis. A summary of this research is displayed in Figure 1 (Appendix).

In the first study in this stream of research Daft et al. (1988) surveyed 50 chief executive officers in manufacturing companies to examine the relationship between the perceived strategic uncertainty in the various sectors of the environment and the amount of scanning they performed in these sectors. The environmental sectors were divided into two types pursuant to typologies developed by Bourgeois (1980) and Dill (1958). The task environment consisted of the environment closest to the organization including the customer sector, supplier sector and competitor sector. These sectors in the task environment are differentiated from those in the general environment, consisting of the social, demographic and economic sectors, because the former involve direct contacts with the organization and the contacts between the latter and the

organization tend to be more indirect. While this typology on environmental sectors has been frequently used, other classifications of environmental elements have been utilized. Priem, Love & Shaffer's (2002) exploratory analysis with Hong Kong based executives found some evidence to support a more fine grained taxonomy of environmental sectors than the internal, task and societal or general environmental classification system that has traditionally been used.

The results of Daft et al., (1988) study did not support the hypothesis that the task environment would create more strategic uncertainty than the general environment. Strategic uncertainty regarding the economic sector, classified in the general environment, exceeded the amount in the competitor and technological sectors of the task environment. They designated the technological sector as a task environment sector because the CEOs surveyed managed companies engaged in manufacturing. However, the results of this study did support the hypothesized positive relationship between scanning frequency and perceived strategic uncertainty in all sectors. They also found a positive relationship between perceived strategic uncertainty and scanning frequency in all scanning modes. In addition, the study found the correlation between scanning frequency and perceived strategic uncertainty was higher for the personal modes than the written modes.

Using a sample of 47 CEOs leading Nigerian manufacturing firms, Sawyerr (1993) studied the relationship between the perceptions of environmental uncertainty and environmental scanning behavior. The study's methodology followed Hambrick (1981; 1982) in measuring scanning frequency and scanning interest. Information source utilization was measured using the Aguilar (1967) typology of internal, external, personal and impersonal sources. Perceived environmental uncertainty was calculated using the aforementioned Daft et al. (1988) latent variable method. The two major sectors of the environment were not perceived as similarly uncertain. The perceived environmental uncertainty scores were significantly higher for the task environment than the societal environment. The results provided evidence of a significant positive relationship between perceived environmental uncertainty scores and the scanning interest criterion variable in all sectors. However, a positive relationship between perceived environmental uncertainty scores and the criterion variable, scanning frequency, was not found for all sectors. In addition, the author found different rankings of perceived environmental uncertainty for various environmental sectors in the Nigerian sample compared to rankings in the Daft et al. (1988) United States sample. Sawyerr attributed the differences to country-specific factors, such as the relatively higher political instability in Nigeria.

In a sample of 141 Bulgarian company executives, Elenkov (1997) further tested the Daft et al.'s (1988) methodology. The results of this study bore some resemblance to the results in the Sawyerr (1993) study. While scanning mode results in Bulgaria were similar to the results in the United States, he did not find evidence to support the hypothesized positive relationship between strategic uncertainty and scanning found in the United States sample. The uncertainty rankings of various sectors were once again different than those of the Daft et al. (1988) United States sample. In the 1988 Daft et al. sample of United States executives, the customer sector ranked highest in perceived strategic uncertainty, whereas Bulgarian respondents gave the highest ranking to the political/legal or regulatory sector. Elenkov attributed certain differences from those in the Daft et al. (1988) study to specific characteristics of the Bulgarian economy.

Using a sample of Russian executives, May et al. (2000) also reported results different from results from the United States sample in the Daft et al. (1988) study. In contrast to the results of the Daft et al. (1988) U.S. sample, the sector rate of change and sector complexity were not significant predictors of scanning behavior in the Russian sample. May et al. (2000) also

attributed differences to country specific factors. In this case, the researchers speculated the persistence of a turbulent economic environment, such as that faced by Russian executives, might result in decision-making that is more centralized and based on substantially less information compared to decision-making in the United States.

Methodological Issues Related to the Perceived Strategic Uncertainty Variable

The use of a latent variable, Strategic Uncertainty, consisting of three different measured variables, Sector Uncertainty, Sector Importance and Sector Rate of Change in the studies summarized in Figure 1. invites further analysis. The use of latent variables can be somewhat problematic for several reasons. Problems with the use of the Strategic Uncertainty in these prior scanning related studies can be illustrated by comparing its use in these studies to various definitions of latent variables. A latent variable has been defined by Nunnally (1978) as being a “hypothetical variable” (p. 607) derived from academic supposition. Alternatively, a latent variable has also been defined as a variable that is unmeasurable or unobservable (Jöreskog & Sörbom, 1979). A third definition describes the outcome of data reduction such as factor analysis (Harman, 1960; Bollen, 2002). Performing factor analysis on the combined items of the component variables in the Daft et al. (1988) study would have possibly yielded a latent variable that is distinct from the mathematically derived latent variable used in the aforementioned prior studies. Another accepted “formal definition” (Bollen, 2002, p.614) of a latent variable includes the requirement that the measured variables forming the basis of the latent variable are uncorrelated. The results in the May et al. (2000) study suggest that the component variables in the Strategic Uncertainty latent variable were indeed highly correlated and therefore not candidates for aggregation into the same latent variable using this definition.

In addition to these arguments against aggregating these individual variables into the Strategic Uncertainty latent variable, doing so makes the actual cognitive motivation less clear than if each component variable was assessed individually. Therefore, the disaggregation of the Strategic Uncertainty latent variable into studies that are limited to individual assessment of its component variables is justified. To investigate the effects of this disaggregation, hypotheses involving the relationship between one of the latent variable components, perceived environmental sector rate of change, and the criterion variable, scanning frequency, for each environmental sector in both the task and societal environment and information source were tested.

Hypothesis 1. There will be a significant positive relationship between perceived environmental sector rate of change and information source scanning frequency for the elements of the task environment.

Hypothesis 2. There will be a significant positive relationship between perceived environmental sector rate of change and information source scanning frequency for the elements of the societal environment.

METHODS

Sample

This study sampled participants in multiple sessions of a Credit Union executive training program conducted in the Southeastern United States. The attendees were asked to complete the written instrument in advance of attending the training sessions. Attendees that had not completed the instrument by the completion of the sessions were contacted and reminded to return the completed surveys. Participants were given a small cash award for the return of completed surveys. The identities of the respondents were recorded for purposes of compensating respondents, but the responses were recorded anonymously. A total of 143 instruments were provided to attendees and 109 usable surveys were returned. Therefore, a 76% response rate was achieved using this protocol.

Early to mid career female managers were the most frequent category of respondents. Over 60% of the respondents were female and 73% were between the ages of 26 and 46. Most respondents had worked for their employers for a reasonably long period of time. Approximately 70% of the respondents had been employed by their company more than 7 years. The respondents were fairly well educated. Approximately 67% had achieved either a bachelors or masters degree.

While Credit Union managers at the career stage and managerial level of the majority of respondents in the present study are not customarily involved in the formulation of corporate or business level strategy their roles do involve decision-making related to the implementation and evaluation of those strategies. Their tasks generally involved the management of a specific branch of the Credit Union or a major functional area within a particular branch or the operational headquarters of the Credit Union. This is in contrast to top level management of the organization. Credit Union managers at this level are more commonly involved in formulating and implementing functional level strategy that is consistent with those corporate or business strategies formulated by top level management. However, the information seeking of these respondents is an important area of study because of the sheer number of decisions related to formulating and implementing functional level strategies that are consistent with the corporate and business level strategies of their organization. In addition, the significance of their decision-making processes in maintaining positive relationships with important outside stakeholders suggests the importance of understanding their information seeking behavior related to that aspect of their decision-making as well.

Measures

Both the predictor and criterion variable were measured using methodology used in the 1988 Daft, Sormunen & Parks study. The predictor variable, perceived environmental sector rate of change, was measured using a portion of their scale designed to measure executive scanning behaviors. The scale identifies six environmental sectors. These sectors include the competitive, customer, technological, regulatory, economic & socio-cultural sectors. This variable reflects the degree of uncertainty associated with each sector. Each respondent's perceptions regarding each environmental sectors rate of change was measured with a five item Likert-type scale with "low" and "high" as anchor points.

The criterion variable, scanning frequency, was measured using a different portion of their scale. The scanning frequency of respondents was measured by asking them to describe how often they used various information sources to get useful information regarding each of the six environmental sectors. The frequency of information source usage was measured with a five

item Likert-type scale with “daily”, “weekly”, “monthly” “few times a year” and “less than once a year” as the measurement options.

The instrument listed written external sources, written internal sources, personal external sources and personal internal sources as possible information sources. Written external sources included the Wall Street Journal, other periodicals, and trade magazines. Written internal sources included special studies, reports, and memos produced by the firm. Personal external sources included business associates, customers, vendors, officials and trade shows. Personal internal sources included subordinates, superiors, coworkers and staff. The Internet was also included as an information source. This source was not included in the Daft et al. (1988) study as its use was more limited at the time the data for that study was collected than when the data for the present study was obtained.

Each environmental sector constituted a different predictor variable in this study. Scanning frequency was measured for each of the five types of information sources for each of the six environmental sectors. Therefore, the significance of 30 individual relationships between perceived environmental sector importance and scanning frequency were assessed. Although prior studies generally aggregated the environmental sectors into either task or general environment (Daft et al., 1988; Bourgeois, 1980; Dill, 1958), the significance of these individual bivariate relationships were measured and assessed in the present study to allow the discovery of the patterns of relationships between perceived uncertainty in each environmental sector and the frequency of use for various information sources. Because the sectors were not aggregated, each relationship was measured with a single item scale and therefore scale reliability and dimensionality concerns were not relevant.

RESULTS

Descriptive statistics for the predictor and criterion variables are shown in Tables 1 through 7 (Appendix). The significance of relationships between the predictor and criterion variables are shown in Table 8 (Appendix). Table 8 reflects reverse coding of the change values so that both environmental sector change and scanning frequency reflect similar ordinal ranking. The pattern of significant relationships between perceived environmental rate of change, reflecting uncertainty, and scanning frequency were somewhat unexpected. The patterns of relationships were distinctly different between the elements of the task and general environments.

The placement of environmental sectors in either the task or general environments is somewhat a matter of judgment. Clearly, the competitive and customer sectors belong in the task environment. Similarly, the economic and sociocultural sectors are clearly part of the societal environment. Arguments can be made that the technological and regulatory sectors could be placed in either the task or general environmental. Respondents in this study were given the definition of each sector. The definitions of these two sectors, based on those used in the Daft et al. (1988) study, given to the respondents were as follows:

The Technological Sector-This sector includes the development of new techniques, methods, innovations and general trends in technology relevant to your company.

The Regulatory Sector-This sector includes federal and state legislation and regulations, city or county policies and political developments at all levels of government.

Based in these definitions, the technology sector was categorized as a task environment sector and the regulatory sector was classified as a general environment sector for purposes of testing the hypotheses.

As shown by Table 8, there were 11 positive significant relationships out of a possible 15 relationships between perceived sector rate of change and scanning frequency for sectors in the general environment. This evidence tends to support Hypothesis 2. However, there were no positive significant relationship between perceived sector rate of change and scanning frequency for sectors in the task environment. This evidence tends not to support Hypothesis 1.

Table 1 reflects the relative perceptions of the rate of change in each environmental sector. The technology sector was reported by respondents as having the highest rate of change and the sociocultural sector was reported as having the lowest. Surprisingly, the regulatory sector rate of change ranked as the second lowest in perceived rate of change. This result was somewhat unexpected given the highly regulated nature of the financial industry. Tables 2 through 7 provide some insight into how the information seeking behavior changes with respect to different environmental sectors. Personal internal sources were most frequently used as an information source for the competitive and customer sectors. The Internet was used as the most frequently accessed source for the technology, regulatory, and sociocultural sectors. Personal Internal Sources and the Internet were tied as the most frequently used for the economic sector. Personal external sources such as business associates, customers, vendors, officials and trade shows were consistently among the least accessed source in each sector. This relatively low level of information seeking activity using these sources may be unique to this industry. These results indicate that the respondents varied their information seeking behavior based from sector to sector.

Only Hypothesis 2, predicting a significant positive relationship between perceived environmental sector rate of change and information source scanning frequency for elements of the general environment, was supported for virtually all information sources and environmental sectors. Hypothesis 1, predicting a significant positive relationship between perceived environmental sector rate of change and information source scanning frequency for elements of the task environment, was not supported.

DISCUSSION

The purpose of this study was to assess the relationship between the perceived rate of change in an environmental sector and the frequency that managers utilize various information sources to get useful information regarding that sector presumably in an effort to reduce uncertainty. The use of more information should usually result in better managerial decisions and organizational performance. The results indicated that the effect of perceived rate of change in an environmental sector did affect the frequency of use for various information sources, but only for certain sectors.

Significant relationships between perceived rate of change and scanning frequency were observed for sectors of the general environment, but not for sectors of the task environment. As the task environment is generally closer and arguably more important to the organization than the general environment, a reasonable expectation would be that there would be a stronger relationship between the perceived rate of change and scanning frequency in the task environment than the general environment. There are several possible explanations as to why

significant relationships between rate of change of the task environment and the frequency of use of information sources were not observed, while these relationships were observed for the rate change of the general environment.

One possibility is that the task environment for the respondent's industry in this study is so stable that it is not deemed necessary by respondents to frequently gather information regarding it. However, as shown in Table 1, the mean scores for perceived rate of change for the task environment sectors were higher for the task environment than for the general environment that did show significant relationships with scanning frequency. Further inspection of Tables 2 through 7 reveal that the most commonly used sources of useful information for both the task and general environmental sectors were personal internal information sources and the Internet. It is possible that these sources are used very frequently on an ongoing basis for a variety of reasons and, therefore, not sensitive to the influence of a particular factor, such as perceived uncertainty.

The Nadkarni & Barr study (2008) suggests another possible explanation for these findings. The stable nature of the Credit Union industry task environment could possibly be expected to result in more scanning related to the general environment. Their finding suggests that managers may tend to focus scanning efforts on based on the relative stability in an environmental sector. They found that that managers tend to scan general environments more frequently when task environments are more stable. However, in the present study the perception of change was higher in the task environment sectors, but there were not significant positive relationships with information source usage for those sectors.

Another possible explanation may be a function of the type of information that would be deemed useful by a manager in assessing each sector. Compared to task environment information, information related to the general environment tends to be more widely available, easier to access, written in less technical language and whose correct interpretation is less critical to the success of the manager and the organization. Therefore, for these reasons information on these sectors may be more likely to be accessed. This possibility is consistent with prior research on the dual system theory of decision-making.

Many recent descriptive decision-making models are based on two distinct systems of reasoning (Sloman, 1996). The terminology used to describe these two systems can vary but the characteristics of the two systems are described in a similar manner. Epstein (1994) described the two systems as experiential and rational; Sloman (2002) characterized them as associative and rule-based, Stanovich and West (2000) and Kahneman (2003) have labeled them as System 1 and System 2. The System 1 or the experiential system is described as a fast, effortless, intuitive process that is subject to emotional influences and is utilized to make many decisions in a near simultaneous manner. The System 2 or the rational system is described as a slow, effortful, rational process that results in decisions that are made sequentially rather than simultaneously. The underlying assumptions regarding the use of the two systems are that System 2 reasoning requires the use of appropriate information and analysis (Kahneman 2003) and that a greater use of System 2 or logic-based reasoning by the decision maker will result in better solutions to more complex problems than a greater use of intuitive reasoning (Stanovich and West 2002). However, the use of System 2 reasoning is slower and more effortful and, as a result is much less frequently utilized than System 1 reasoning. Therefore, information seeking activity for the general environment may be more frequent because it is easier and faster to access and interpret.

The results, shown in Tables 2 through 7, provide some empirical support for this explanation. The two most frequently accessed information sources for all six environmental sectors were personal internal sources, which included subordinates, superiors, coworkers and staff, and the Internet. Presumably, managers access these sources regularly for many reasons and gathering information regarding environmental sectors from these sources requires very little additional effort. Gathering information from written external and internal sources and from personal external sources such as business associates, customers, vendors, officials and trade shows would likely require substantially more effort and planning.

However, information that is the easiest to access and most readily available may not be the most accurate. Information from the Internet may not always be reliable. Information gained from within the organization may be subject to institutional forces that result in a degree of isomorphism with respect to how information is expressed and interpreted (DiMaggio & Powell, 1983). The relatively less frequent use of personal external sources to monitor all environmental sectors suggests that this information source, which may often be more objective but also the most effortful, may be underutilized.

Organizational leaders have the potential to improve the scanning performance of their lower level managers in many ways. First, the creation of an organizational culture that encourages managers to regularly seek information, particularly from personal external sources, can be encouraged by providing resources to access these sources on a frequent basis and by recognizing superior performance in seeking and obtaining information from them. Second, organizational leadership can clearly articulate the strategic direction of the organization and what environmental factors are critical to the success in executing the preferred strategic direction. Members of the organization would then benefit from having their information focused in more productive directions. Finally, managers can be provided training in which specific information is the most helpful in monitoring changes in the environmental sectors and where that information can be found.

The decision-making processes of managers should consider relevant changes in the environment if optimum decision outcomes are to be achieved. That objective may not be achieved if a scanning process omits important information about such changes. The results of this study suggest ease of access to information rather than information relevancy may significantly influence the information gathering process used by managers to the possible detriment of the organization.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Busy individuals are often reluctant to participate in survey-based data collection efforts (Newby, Watson, & Woodliff, 2003; Markman, Balkin, & Baron, 2002). Consequently, the length and scope of survey instruments are limited as is the ability to assess the relationship of large numbers of variables. Collecting cognitively based data from managers related to decision-making behavior often requires the use of self-report measures and reliance on the recollection of past behaviors or attitudes. However, Brewin, Andrews and Gotlib (1993) have determined the retrospective recall of specific events or facts is quite accurate.

These limitations often also preclude the desirable use of multiple measures of a single construct. An additional bias resulting from obtaining the data using a single method is possible (Avolio, Yammarino & Bass, 1991; Spector, 1987). Spector (1987) found this bias was of minor consequence in an analysis of employee self-report measures. Relative rankings of similar items

were used for analysis. In the present study, any common method bias would similarly affect those items and be less influential with respect to individual rankings. The present study involved only one industry. This methodology eliminates any industry effects on the results, but also imposes possible limits on the generalizability of the findings to managers in other industries. Designing studies that simultaneously include managers from two or more industries should increase the generalizability of these findings.

While providing evidence to support the differential frequency of use of information sources by managers based on their perceived rate of change the environmental sectors in which their organization operates, many new questions became apparent. The study assessed the frequency of information seeking behavior by measuring the number of times information sources were judged to be helpful, but did not endeavor to assess the quality of the sources that were contacted. A future study that includes a much finer grained listing of sources within each category should prove instructive. Not all external and internal information sources are likely to be of equal value. Soliciting the opinions of respondents regarding what they perceive as the most helpful external personal and written sources might not only provide useful directions for future research, but also provide guidance to organizational leadership seeking to provide training to its managers. Since the Internet was rated highest or next to highest in the frequency of use, further research is warranted to determine what sites are the most frequently visited to provide information on each environmental sector and which are perceived to be the most helpful. Finally, because one possible explanation for the lack of relationship between perceived rate of change in task environmental sectors and frequency of scanning relates to possible difficulty in obtaining information, future studies could include an assessment of respondents perceived effort associated with obtaining information from specific sources.

PRACTICAL IMPLICATIONS

The results of this study suggest many managers do not always allocate time to scanning environmental sectors based on how rapid they perceive the rate of change to be in that sector. Scanning related to the task sector is arguably more important to organizational performance than the general sector in most cases, but may be less influenced by the perceived rate of change in that sector. A likely explanation for this phenomenon is that the scanning related to the task environment from certain sources requires more time and effort. This suggests that organizations do not sufficiently encourage scanning behavior by their managers, particularly with respect to the task environment, by providing sufficient resources and incentives to encourage that behavior. Thus, the information seeking behavior of managers can be greatly influenced by not only the perceived rate of change of an environmental sector and the effect of that change on organizational performance, but also by their perceptions of the importance of the information seeking process to their organizational leaders.

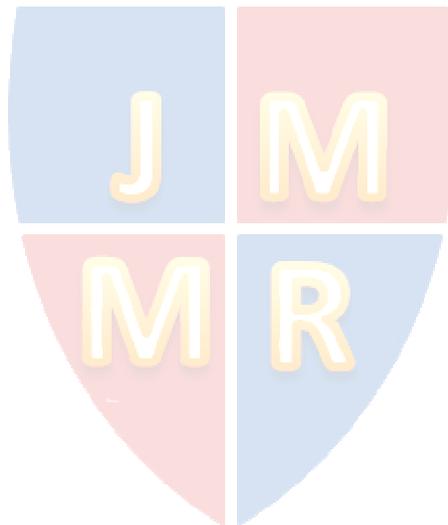
An organization where managers do not sufficiently recognize the importance of changes in environmental sectors to organizational performance and where organizational leadership does little to encourage information search behavior will likely be at a significant competitive disadvantage compared to an organization that articulates a strategic direction to its managers, describes what environmental information relates to that direction and facilitates an ongoing quest for that relevant environmental information.

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APPENDIX

Figure 1.
Summary of Prior Research
Perceived Strategic Uncertainty (PSU) Criterion

Study	Setting	PSU positively related to scanning frequency	PSU positively related to the use of personal scanning modes	PSU positively related to the use of impersonal personal scanning modes
Daft et al. (1988)	United States	Supported	Supported	Supported
Sawyer (1993)	Nigeria	Partially supported	Not supported	Partially supported
Elenkov (1994)	Bulgaria	Not supported	Supported	Not supported
May et al. (2000)	Russia	Not supported	Not supported	Not supported

Table 1
Descriptive Statistics
Predictor Variable
Perceived Rate of Sector Change
Low=1 High=5

	N	Mean	S.D.
Task Sectors			
Competitive Sector	106	4.05	.89
Customer Sector	106	3.76	.86
Technology Sector	106	4.32	.74
General Sectors			
Regulatory Sector	106	3.40	.76
Economic Sector	106	4.03	.88
Sociocultural Sector	106	2.82	1.05

Table 2
Descriptive Statistics
Criterion Variable
Scanning Frequency
The Competitive Sector
Daily=5 Weekly=4 Monthly=3 A Few Times a Year=2 Less Than Once a Year =1

Scanning Source	N	Mean	S.D.
Written External Sources (e.g. trade magazines)	107	3.33	.94
Written Internal Sources (e.g. reports, memos)	107	3.13	1.12
Personal External Sources (e.g. customers, vendors)	107	3.15	.95
Personal Internal Sources (e.g. superiors, coworkers, subordinates)	107	3.87	.89
The Internet	106	3.56	.95

Table 3

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Descriptive Statistics			
Criterion Variable			
Scanning Frequency			
The Customer Sector			
Daily=5 Weekly=4 Monthly=3 A Few Times a Year=2 Less Than Once a Year =1			
Scanning Source	N	Mean	S.D.
Written External Sources (e.g. trade magazines)	107	3.25	1.06
Written Internal Sources (e.g. reports, memos)	107	3.40	1.17
Personal External Sources (e.g. customers, vendors)	107	3.23	1.07
Personal Internal Sources (e.g. superiors, coworkers, subordinates)	107	4.02	.91
The Internet	105	3.66	1.10

Table 4			
Descriptive Statistics			
Criterion Variable			
Scanning Frequency			
The Technology Sector			
Daily=5 Weekly=4 Monthly=3 A Few Times a Year=2 Less Than Once a Year =1			
Scanning Source	N	Mean	S.D.
Written External Sources (e.g. trade magazines)	106	2.84	.98
Written Internal Sources (e.g. reports, memos)	106	2.71	1.00
Personal External Sources (e.g. customers, vendors)	107	2.79	.87
Personal Internal Sources (e.g. superiors, coworkers, subordinates)	107	3.39	.93
The Internet	105	3.41	1.03

Table 5			
Descriptive Statistics			
Criterion Variable			
Scanning Frequency			
The Regulatory Sector			
Daily=5 Weekly=4 Monthly=3 A Few Times a Year=2 Less Than Once a Year =1			
Scanning Source	N	Mean	S.D.
Written External Sources (e.g. trade magazines)	105	2.83	.99
Written Internal Sources (e.g. reports, memos)	107	2.76	.99
Personal External Sources (e.g. customers, vendors)	107	2.64	.86
Personal Internal Sources (e.g. superiors, coworkers, subordinates)	107	3.08	.96
The Internet	106	3.23	1.06

Table 6 Descriptive Statistics Criterion Variable Scanning Frequency The Economic Sector Daily=5 Weekly=4 Monthly=3 A Few Times a Year=2 Less Than Once a Year =1			
Scanning Source	N	Mean	S.D.
Written External Sources (e.g. trade magazines)	106	3.51	1.12
Written Internal Sources (e.g. reports, memos)	107	3.16	1.27
Personal External Sources (e.g. customers, vendors)	107	3.07	1.01
Personal Internal Sources (e.g. superiors, coworkers, subordinates)	107	3.70	2.02
The Internet	106	3.70	1.14

Table 7 Descriptive Statistics Criterion Variable Scanning Frequency The Sociocultural Sector Daily=5 Weekly=4 Monthly=3 A Few Times a Year=2 Less Than Once a Year =1			
Scanning Source	N	Mean	S.D.
Written External Sources (e.g. trade magazines)	106	2.25	1.04
Written Internal Sources (e.g. reports, memos)	107	2.06	.99
Personal External Sources (e.g. customers, vendors)	107	2.34	1.11
Personal Internal Sources (e.g. superiors, coworkers, subordinates)	107	2.64	1.32
The Internet	106	2.82	1.40

Table 8 Patterns of Relationships Between Perceived Sector Rate of Change and Information Source Frequency of Use						
Bivariate Pairwise Correlations N = 104-106 * $<.05$ ** $<.01$ (two tailed)	Competitive Sector	Customer Sector	Technology Sector	Regulatory Sector	Economic Sector	Sociocultural Sector
Written External Sources (e.g. trade magazines)	.06	-.15	.04	.33**	.19	.38**
Written Internal Sources (e.g. reports, memos)	.13	.13	.04	.35**	.34**	.27**
Personal External Sources (e.g. customers, vendors)	.04	.05	.14	.05	.29**	.34**
Personal Internal Sources (e.g. superiors, coworkers, subordinates)	.15	.00	.13	.25*	.01	.51**
The Internet	.14	-.02	.11	.31**	.16	.33**