

# The Contribution of Environmental Scanning to Organizational Performance

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## **Abstract**

Environmental scanning, the radar to detect environmental signals, is serving as an effective way for organizations to cope with uncertainties and formulate adaptive strategies. Strategists and strategic management scholars also believe that effective environmental scanning would help organizations to achieve better alignment with rapidly changing external factors and hence improve their performance. It is, therefore, desirable to explore the relationship among environmental uncertainty, environmental scanning, and organizational performance. This paper starts with the definition and process of environmental scanning, followed by the introduction of environmental uncertainty as well as the indirect impact of environmental scanning on organization performance. Prior empirical studies trying to discover or demonstrate the potential relationships are also reviewed. Finally, the refined theoretical model as well as the proposed research methodology is presented.

**Keywords:** Environmental Uncertainty, Environmental Scanning and Organizational Performance

## Introduction

Organisations today are facing unprecedented challenges in maintaining commercial survival and success. Due to the rapid changes happening in today's marketplace and emerging business practices, it is more likely for an organisation, to fall behind by not keeping up with trends of their external environments (Albright, 2004). On the one hand, numerous companies went out of business simply because a change happened in their business environment to which they failed to respond quickly and appropriately. On the other hand, actively detecting environmental signals and immediately grasping opportunities or countering threats can lead firms to success and prosperity. Environmental scanning, serving as "the first link in the chain of perceptions and actions that permit an organization to adapt to its environment" (Hambrick, 1981; Jennings & Lumpkin, 1992), has become an important aspect of strategic management for coping with environmental uncertainties, and the impact of environmental scanning to organizational performance has been receiving more and more attention among scholars.

Environmental scanning is a systematic process starts from scanning needs identification and ends at evaluation and utilization of environmental information. With the term coined in the late 1960s, environmental scanning is still an emerging discipline, with explorative studies conducted in various organisations. In light of the changes and developments, it has become imperative for organisations to scan their environments continuously and systematically with all the phases being studied as a whole. However, in prior literature, besides information acquisition, insufficient attention has been paid to the other steps of environmental scanning. Moreover, for studies attempting to discover or demonstrate the association between environmental scanning and organizational performance, the majority of them chose to measure organization's financial performance only, such as profitability, return on capital and net profit margin, while neglecting the other aspects as customer satisfaction, operation efficiency and organization growth. As a result, there is a need to develop a refined model presenting a clearly defined environmental scanning process, paying equal attention to all its steps while investigating the impact of environmental uncertainty, and showing the indirect contribution of environmental scanning on organizational performance other than merely from the final perspective.

## Definition and Process of Environmental Scanning

In the field of environmental scanning, the first notable study was carried out by Aguilar (1967). Aguilar defines environmental scanning as acquiring information about events and relationships in a company's outside environment, the knowledge of which would assist top management in its task of charting the company's future course of action. Based on this definition, organisations scan the environment in order to get a strategic understanding of external influences so that they may be able to develop effective response that secures or adjusts their position in the future.

Subsequent studies reinforced Aguilar's definition without substantially altering this perspective; however, the process of environmental scanning was gradually extended and has been conceptualized as an integrated information management system. Aaker (1983) pointed out that environmental scanning should focus on target information needs, allocate effort among employees exposed to relevant information, and have an effective system for storing, processing and disseminating information. According to Daft and Weick (1984), the way an organisation deciphers its environment in order to learn from it may be divided into three phases: scanning (information seeking), interpretation (giving meaning to the collected data) and learning (taking action based on the data). Similarly, Lester and Waters (1989) define environmental scanning as a management process of using information from the environment to aid decision-making with three key components: obtaining the information, analyzing the information and using the information. These definitions highlight the consequent steps after information acquisition. Based on the foundation of Aaker (1983), Costa (1995) proposes a strategic information scanning system which consists of six steps, in order to preserve much of the information which is invariably lost in many organisations, and hence enhance the effectiveness of these scanning efforts. Steps one and two of his proposed system specify information needs and sources; steps three and four identify the participants of the system and assign them scanning tasks; and steps five and six deal with the storage, processing and dissemination of the information (Costa, 1995). Albright (2004) raises five integrally linked steps by omitting information organisation and storage. Similarly, Hough and White (2004) view environment scanning as a process of identifying, collecting, processing and translating information about external influences into useful plans and decisions.

## External Environment and Uncertainty

The external environment refers to the relevant social and physical factors outside the typical boundaries of an organisation which affect managerial decision-making (McGee & Sawyerr, 2003; Sawyerr, 1993). Broadly, the external environment can be divided into two categories: the task or domain environment which has a direct impact on company tasks and outcomes and the remote environment with indirect and long-term impacts (Carpenter & Sanders, 2009; Dill, 1958; Hall, 1982; Myburgh, 2004; Sawyerr, 1993). Specifically, the task environment, commonly recognized as more significant, includes customers, suppliers (resources), competitors and other stakeholders, while the remote environment broadly consists of six sectors, i.e. political, economic, social-cultural, technological environmental and legal sectors (Dill, 1958; Hall, 1982; Myburgh, 2004; Sawyerr, 1993). Task environment is organisation-specific, i.e. each organisation operates in its unique task environment. However, companies operating in the same industry domain may have similar task environment, if they choose the same target market or the same group of suppliers; at the same time, they would become part of the task environment for each other as one of the competitors (Organization A and B in Figure 1).

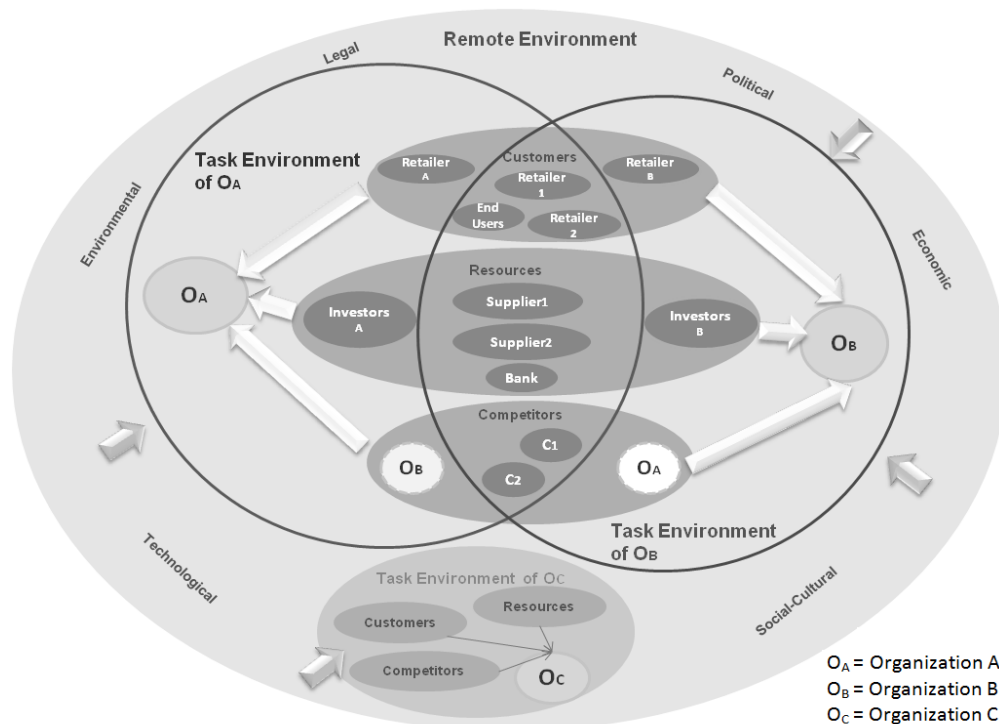


Figure 1: The External Environment

Environmental uncertainty has long been viewed as a central concept in the organization theory literature, particularly in theories seeking to explain the nature of the relationship between organizations and their environments (Buchko, 1994; Milliken, 1987). Pioneer studies on environmental uncertainty either measure it “objectively” (Tinker, 1976) or “perceptually” (Child, 1972; Downey & Slocum, 1975). However, as environmental issues are often ambiguous and require interpretation for issue diagnosis, perceptions are critical in guiding decision making (Boyd, Dess, & Rasheed, 1993; Daft & Weick, 1984). Hence, perceived environmental uncertainty has more influence on scanning than objective environmental conditions.

Perceived environmental uncertainty occurs when administrators perceive unpredictability of an organization’s environment (Buchko, 1994; Milliken, 1987). It is the difference between available information and derived information (Daft, Sormunen, & Parks, 1988; Galbraith, 1977). In other words, decision-makers perceive uncertainty of the environment when they do not feel confident that they understand the major events or trends happening in the external environment, or when they feel unable to accurately assign probabilities to the likelihood that particular events and/or changes will occur (Milliken, 1987). Specifically, two environmental characteristics, degree of complexity and rate of change, influence perceived environmental uncertainty (Duncan, 1972; Robbins & Coulter, 2005). Degree of complexity refers to the number of external components that are relevant to the organization (Child, 1972; Duncan, 1972; Robbins & Coulter, 2005), while rate of change refers to the frequency of changes that occurs in the organization’s external environment (Duncan, 1972; Robbins & Coulter, 2005).

Daft et al. (1988) further proposed that scanning was affected more when perceived environmental uncertainty was located in strategically important sectors. They noted that uncertainty by itself will not lead to scanning behaviour, unless the external components are perceived as important to organizational performance. The combination of perceived environmental uncertainty and strategic importance creates “perceived strategic uncertainty” (PSU) for decision-makers, and is expected to generate a need for them to conduct scanning for the selected environmental sectors (Daft et al., 1988).

## **Environmental Scanning and Organizational Performance**

It would not be accurate to claim that environmental scanning would lead directly to better organizational performance, as performance would be influenced through a combination of various factors (Daft et al., 1988). However, a careful tailoring of scanning to strategic intent does provide input for incremental environment-strategy fit (Kumar, Subramanian, & Strandholm, 2001). Effective scanning underlies the sound executive choices and judgment that are essential for strategic success (Child, 1972, 1997; Garg, Walters, & Priem, 2003), as it would be able to provide a company industry foresight and the potential to get to the future before the competitors thereby obtaining a leadership position in the market place (Hamel & Prahalad, 1994). Empirical studies also suggest that scanning has value associated with faster reaction times, higher growth rates, enhancement of firms' knowledge base and their effective planning horizon (Stoffels, 1994). Therefore, organizations conducting effective environmental scanning activities would be more likely to cope with threats and grasp opportunities, and hence obtain sustainable competitive advantages. The "fit" between organizations and their environments is proposed to be the most significant predictor of organizational survival and performance (Boyd & Fulk, 1996), while environmental scanning is the most effective way to achieve such alignment.

Specifically, with effective scanning, organizations would be able to obtain more accurate market and industry insights, and hence more likely to satisfy current customers and explore new market segments, successfully develop and market new products/services based on trend analysis (Ahituv, Zif, & Machlin, 1998; Kohn, 2005), establish better brand images, all of which would ultimately contribute to the financial performance. Moreover, environmental scanning has been found to be useful for reducing environmental uncertainty and assisting in companies' risk management. With sufficient environmental intelligence, organizations would be able to manage strategic surprise and response quickly even to weak signals (Ansoff, 1975).

### **Prior Empirical Studies**

Theoretically, perceived strategic uncertainty will trigger the need for scanning (Daft et al., 1988; Elenkov, 1997a). Strategists and strategic management scholars generally agree that both large and small firms that align their business strategies with their respective environments are likely to

outperform firms that fail to achieve such alignment (Venkatraman & Prescott, 1990). In prior literature, a number of studies attempted to discover or demonstrate the association between environmental uncertainty, environmental scanning and organisational performance, for both large and small firms, for-profit and non-profit organisations as follows.

### **Adopted Measurements**

#### *Measurement of Environmental Uncertainty*

The most widely adopted method in prior studies for measuring environmental uncertainty is  $PSU = PI \times (C+R)$ , where PSU = perceived strategic uncertainty; PI = perceived sector importance; C+R = perceived sector uncertainty; C = the perceived sector complexity; R = the perceived sector rate of change (Ahituv et al., 1998; Auster & Choo, 1993; Daft et al., 1988; Ebrahimi, 2000; May, Stewart, & Sweo, 2000; Sawyerr, 1993; Stewart, May, & Kalia, 2008). Researchers used this formula to measure the perceived strategic uncertainty of various environmental sectors respectively, and the results were averaged to obtain the perceived strategic uncertainty for both remote environment and task environment. Boynton, Gales and Blackburn (1993) measured uncertainty through two dimensions, AVAIL (the availability of needed information) and PREDICT (the predictability of future outcomes); Olsen, Murthy and Teare (1994) required study participants to rate the uncertainty of their firm's environment on a continuum ranging from stable to volatile; Boyd and Fulk (1996) investigated two dimensions of uncertainty as strategic variability (an event's variability multiplied by its strategic importance) and complexity (analyzability, predictability and adequacy of information); Elenkov (1997b) used a revised formula, which is  $SU = EU \times I$ , where SU = perceived strategic uncertainty; EU = perceived environmental uncertainty (degree of predictability for various characteristics of the environmental sectors); I = perceived sector importance; Hough and White (2004) asked participants to report the uncertainty by 3 levels (dynamic, moderate and stable).

#### *Measurement of Environmental Scanning*

The frequency of scanning (frequency of collecting information about each environmental sector) and the degree of interest (the degree to which the executives made it a point to stay abreast of information from each sector) were the most widely used two dimensions for measuring ES. These two dimensions were firstly used by Hambrick (1982). However, these two dimensions were measured differently by different researchers. The frequency of scanning could be measured through a Likert scale ranging from seldom to regularly (Ebrahimi,

2000; Elenkov, 1997a; Elenkov, 1997b; Strandholm & Kumar, 2003) or on a 5 or 6 point scale with a range from never (0) to daily (365) (McGee & Sawyerr, 2003; Sawyerr, 1992; Sawyerr, 1993). The degree of interest was measured on a 5 or 7 point ordinal scale from very low to very high (Boyd & Fulk, 1996; Ebrahimi, 2000; McGee & Sawyerr, 2003; Sawyerr, 1992; Sawyerr, 1993). Besides these two, other covered dimensions of ES include scope of scanning (Beal, 2000; Strandholm & Kumar, 2003), use/accessibility of information sources (May et al., 2000; Ngamkroekjoti & Speece, 2008; Stewart et al., 2008), scanning completeness measured by number of information bits known at end divided by number of information bits available (Hough & White, 2004), time spent on scanning (Boynton et al., 1993), type of scanning system (Primitive, ad hoc, reactive and proactive) (Subramanian, Fernandes, & Harper, 1993), type and role of scanning unit (Olsen et al., 1994) and scanning function (Subramanian et al., 1993).

#### *Measurement of Organisational Performance*

Since the late 1980s, researchers have started to demonstrate the contribution of ES to organisational performance. The most adopted measures are about financial performance, such as profitability (return on assets), return on sales, growth in sales (Ahituv et al., 1998; Brush, 1992; Daft et al., 1988; McGee & Sawyerr, 2003; Olsen et al., 1994; Subramanian et al., 1993; West, 1988). Some researchers used subjective approach through self-reporting measures. Kumar *et al.* (2001) asked participants for their assessment of their organisation's performance on various measures. Similarly, Garg *et al.* (2003) required the CEOs to report their best subjective estimates of performance compared to similar firms in their industry on a 5-point scale for after tax return on total sales/assets, sales growth and overall performance/success. Beal (2000) required participants to scale six financial performance indicators, including measures of profitability, growth and total amount of profits, based on their perceived importance and satisfaction.

It is worth noting that besides the financial measures, other aspects of organisational performance, such as customer satisfaction, operation efficiency, employee satisfaction, are not equally treated as important. Very limited studies have paid attention to these measures. Strandholm and Kumar (2003) included efficiency (per employee/patient expenditure) and effectiveness (capacity utilization of hospital facilities) as performance measures while investigating hospitals' environmental scanning activities. Ngamkroekjoti and



Speece (2008) used customer acceptance as one factor to evaluate new product performance.

### **Discovered Relationships**

#### *Environmental Uncertainty and Scanning*

To investigate the relationship between environmental uncertainty and scanning mode, Daft *et al.* (1988) interviewed chief executives of 50 manufacturing companies and concluded that the managers respond to higher strategic uncertainty by using human sources somewhat more often than written sources. Through personal interviews with executives in 141 medium-size Bulgarian companies, Elenkov (1997a) also discovered that the higher the uncertainty in the domain environment, the more frequently decision-makers in Bulgarian companies relied on personal modes of scanning, i.e. scanning through direct human contact.

Regarding the relationship between environmental uncertainty and frequency of scanning, researchers tend to hold different views based on the results of their studies. Some researchers suggest a linear relationship where increased uncertainty would lead to increased scanning frequency (McGee & Sawyerr, 2003; Sawyerr, 1993). The study conducted by Ebrahimi (2000) partially supports the linear relationship, as it is discovered that greater perceived strategic uncertainty resulting in higher degree of interest is only true for task and remote environment, but not for external environment as a whole. Conversely, Elenkov (1997a) failed to provide evidence of a positive relationship between strategic uncertainty and frequency of scanning. Moreover, a recent study conducted among SMEs in Singapore showed that if overall general environment is dynamic and uncertain, even organisations in relatively stable industries also feel the need for active ES (Majid & Kowtha, 2008).

Instead of proposing a simple linear relationship between the two, some researchers discovered more complex relationships. Choo (1993) found that the use frequency of various information sources is positively correlated with perceived source accessibility, perceived source quality and perceived environmental uncertainty, and perceived source quality accounts for the most of the variance of the frequency of the source use. Similarly, Stewart and Sweo (2000) reported that strategic uncertainty was moderated by perceptions of accessibility in determining scanning frequency. Boynton, Gales and Blackburn (1993) proposed an inverted U-shape relationship, arguing that scanning increases as environmental uncertainty increases and then reaches a threshold where the uncertainty becomes so

overwhelming that scanning frequency decreases. However, the results turned out to be just opposite their hypothesis: the highest levels of information search activity took place where uncertainty was either low or high while at intermediate levels of uncertainty managers engage in significantly less search activity.

#### *Environmental Scanning and Organisational Performance*

Correlation analysis was used in prior studies to identify the impact of environmental scanning to organisational performance through financial measures. Some researchers successfully demonstrated that better environmental scanning (more frequent/broader collection of environmental information or more advanced scanning system) would result in better organisational performance (Garg et al., 2003; Strandholm & Kumar, 2003; Subramanian et al., 1993; Subramanian, Kumar, & Yauger, 1994; West, 1988). There are also some studies failed to establish a link between the two. Based on the analysis results of a survey conducted by Brush (1992), few highly significant correlations were found between performance variables and type of marketplace information, methods or sources. Sawyerr *et al.* (2000) examined use of information sources, ES practices and organisational performance of 47 small to medium-sized manufacturing firms in Nigeria. It was discovered that scanning frequency did not appear to affect organisational financial performance as measured by self-reported return on equity and profit margin. They suspected that the missing link may probably be due to the absence of actual performance data. Beal (2000) also concluded that the frequency of scanning has no effect on the alignment between competitive strategies and environments and hence organisational performance. According to Beal (2000), the unexpected result may probably be caused by the uncontrolled factors like industry and firm size, etc.

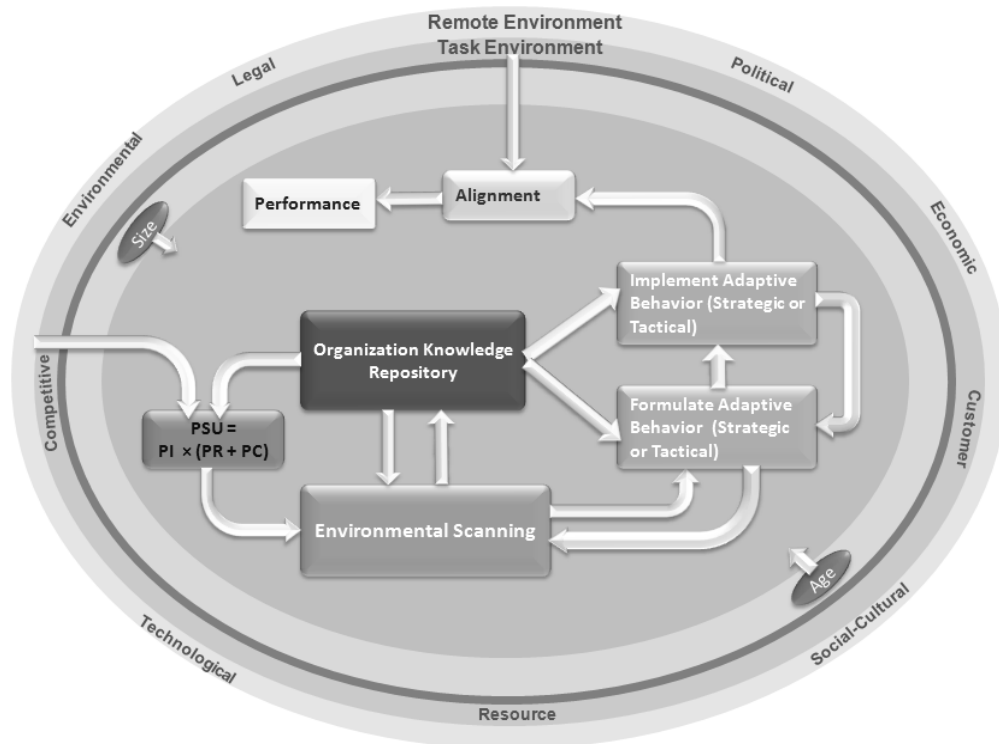
#### *Environmental Uncertainty, Scanning and Organisational Performance*

There are also a few studies investigating the relationship among the three. Daft, Sormunen and Parks (1988) concluded that when sector uncertainty was high, executives reported greater frequency of scanning and greater use of personal information sources. Moreover, chief executives in high-performing companies scanned more frequently and more broadly in response to strategic uncertainty than their counterparts in low performing companies. Ahituv, Zif and Machlin (1998) discovered that firms succeeding better with new products will show a greater correlation between strategic uncertainty and frequency of scanning of the technological, economic and socio-

cultural sectors, and more successful firms will exhibit more frequent formal scanning in the task environment. The study conducted by Olsen, Murthy and Teare (1994) demonstrated that hotels with higher growth in sales showed greater interest in customer-related issues, and hotels with higher growth in income and rooms showed greater interest in demographic changes, competitor offerings and new technological developments.

## Toward a Refined Model of Environmental Scanning

Based on the literature review, a model representing the relationship among perceived strategic uncertainty, environmental scanning and organizational performance is proposed, with consideration of some additional factors (Figure 2). It shows that organizations' internal activities



**Figure 2:** Relationship Model of Perceived Strategic Uncertainty,

### Environmental Scanning and Organisational Performance

are directed by organization knowledge and influenced by their external environments, both remote and task environments. Organization knowledge

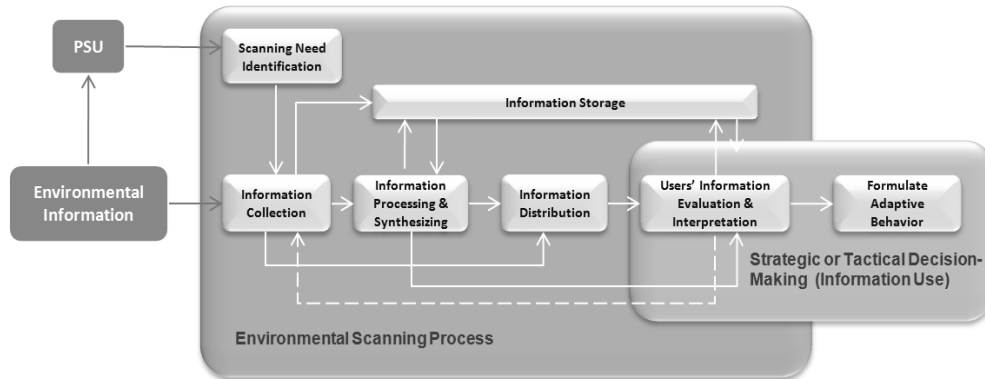
includes explicit knowledge (e.g. operation routines, organization regulations, minutes and various kinds of reports), and tacit knowledge of both employees and decision-makers, as well as the cultural knowledge known as shared assumptions and beliefs. Organization knowledge and the information/knowledge system for collecting, storing, processing, disseminating and sharing information/knowledge comprise organizational knowledge repository. This repository may take the form of a formal computer-based information system or other more rudimentary system like storing information in paper files, sharing information through informal conversation over lunch, etc. When the existing organisational knowledge cannot interpret or understand the signals from external environments, organisations perceive it as uncertainty. If the uncertainty occurs in the environmental sectors with strategic importance, it would generate scanning needs which require organisations to actively collect more information about their external environments to help understand the emerging trends, and hence reduce risks or threats and detect potential opportunities.

Through the whole process of environmental scanning, the final outcome of environmental scanning, as newly formulated insights about the external environments, would automatically become part of the organisational knowledge and assist in strategy formulation. If the formulated strategy is well-implemented, it could help an organisation to achieve alignment with its external environments, in terms of grasping opportunities and overcoming threats. As a result, the organisation is likely to gain competitive advantage, achieve strategy-environment alignment, and hence improve the chance of achieving better organisational performance. Some organisational factors, such as age and size, according to prior studies (Mohan-Neill, 1995; Strandholm & Kumar, 2003), may have certain moderating effects on the whole process.

The proposed model addresses the common limitations shared by prior empirical studies. The first limitation is regarding the variables used to measure scanning activities. As environmental scanning is defined as a systematic process starting with information needs identification and ending with the environmental information ready for tactical and strategic usage, all the steps may have influences on its ultimate effectiveness and efficiency. The majority or nearly all of the previous studies investigating scanning process have mainly focused on the phase of information collection with some easily measurable variables such as frequency of scanning, use of different kinds of information sources (personal and non-personal, internal and external) and scanned environmental sectors, while neglecting the other activities such as needs identification, information processing, organizing, dissemination and utilization. It is possible that some organizations do well in information collection but poorly in processing and dissemination. As such,

all the steps of environmental scanning should be studied simultaneously to measure their overall contribution to organizational performance.

Synthesizing the prior literature, a six-step scanning process is proposed (Figure 3). The formal environmental scanning process starts with



**Figure 3:** Environmental Scanning Process

the clearly defined scanning needs. Organizations actively collect environmental information through various channels and from various information sources. The collected information will be stored for future use or be processed and synthesized with the existing organizational knowledge. After filtering (removing the irrelevant part of the information), repackaging (selecting information from different sources and merging it) or interpreting (analyzing and adding personal interpretation to the collected information), the processed environmental intelligence may be stored in organization knowledge repository for future utilization, or disseminated to target users. Upon receiving, the end-users may evaluate its quality, such as timeliness, relevancy and accuracy, and finalize it to become the ultimate environmental scanning product, which is ready for immediate or future use. However, it is worth noting that, sometimes steps like “information processing and synthesizing” and “information distribution” may be skipped due to certain factors, such as limited time or short of human resources, or the collector of information will use it by him/herself without sharing it with others. In addition, “use of environmental information” may not be fully included in the proposed scanning process. Environmental scanning is expected to end at “users’ evaluation and interpretation”, i.e. the stage where environmental information is ready for tactical or strategic usage. However, the subsequent steps such as how the environmental information would be used, what kind of strategy would be formulated, what other factors would be considered during strategy formulation, and how the strategy would be implemented, are strategic management issues and out of the scope of scanning process.

The second limitation is shared among studies attempting to discover or demonstrate the association between environmental scanning and organizational performance. The majority of those studies chose to measure organization's financial performance only, such as profitability, return on capital and net profit margin. Based on the literature, environmental scanning could be used for reducing uncertainty and assisting strategic management and planning. This kind of contribution may not be directly or immediately revealed in organizations' balance sheet, but it may have influences on firm's long-term growth and future development. To address this problem, firstly, the refined model highlights the indirect relationship between scanning and organization performance. It states that the impact of scanning is through its end products ---- formulated insights ready for assisting tactical and strategic decision making, while other issues which may also influence organization performance, such as strategy formulation, strategy implementation, is not considered as the process of scanning. In another words, more effective environmental scanning process may not be able to lead to better organization performance, unless the scanning product is accurately and timely incorporated into the strategy formulation process, and the newly formulated strategy is successfully implemented.



**Figure 4:** Five Perspectives for Performance Management

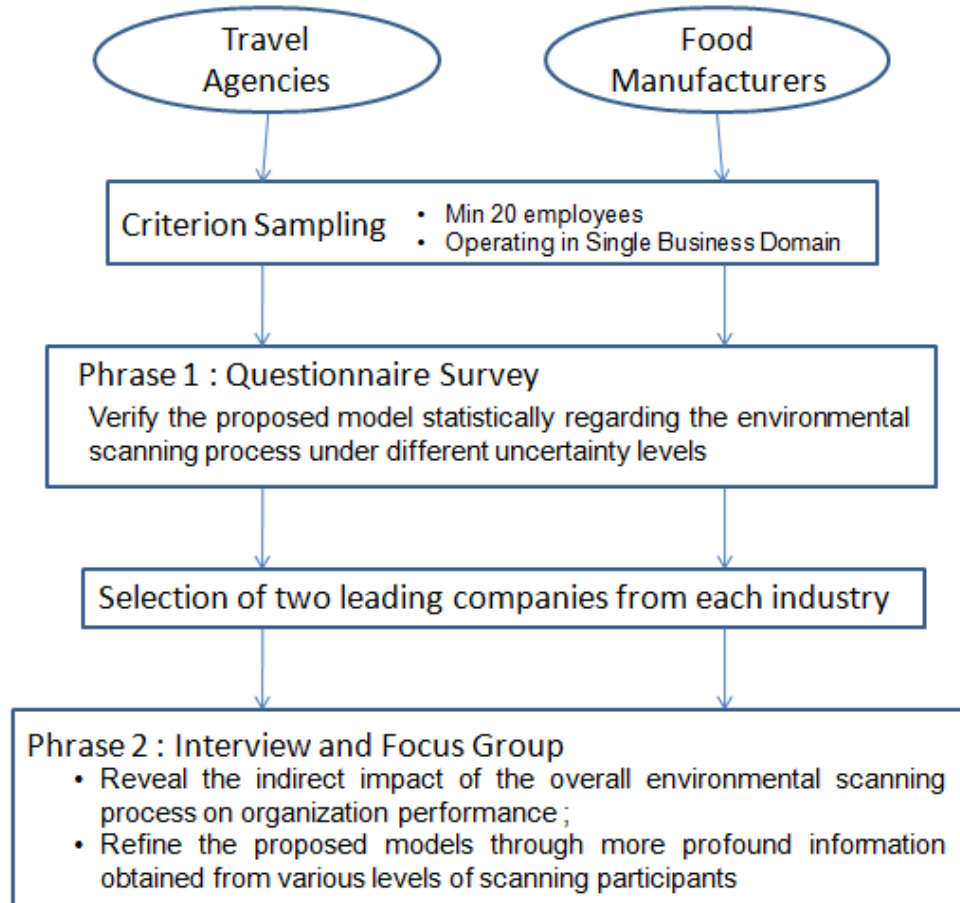
Secondly, it is also proposed that to identify the contribution of environmental scanning to business success, it would be better to evaluate the organization performance from various perspectives. Five perspectives, including four non-financial measures, are proposed to be covered (Figure 4), as non-financial measures are at the heart of describing and communicating strategy (Sousa, Aspinwall, & Rodrigues, 2006). Four of the perspectives are adapted from the balanced scorecard approach, i.e. financial, customer, internal business process (IBP) and learning and growth perspectives (Kaplan & Norton, 1996). Employee perspective is also included as one of the the proposed measure, as it is not highlighted in the balanced scorecard since Marr (2005) found that many organizations mis-interpret the learning and growth perspective as employee perspective.

## **Proposed Research Methodology**

In order to verify and validate the proposed model, we propose to conduct a study of Singapore firms from two different industries, namely, the food industry and the travel industry. These two industries are chosen due to their different environmental uncertainty levels, which allow the comparison of potentially different environmental scanning activities. The food industry is comparatively more stable as the products are related to basic human necessities and therefore, not expected to be largely impacted by environmental changes. However, the travel industry is a typical sector operating in a highly dynamic and uncertain environment. Various factors may have significant impact on companies operating in this industry, such as diseases (SARS, influenza), terrorism, and economic crisis.

Both quantitative and qualitative methods will be used in the research design and data collection (Figure 5). In Phase 1 of the study, we will use a questionnaire survey to collect data due to three main reasons. Firstly, there have been very few studies on the scanning behaviour of Singapore companies, and very limited effort has been made to investigate the whole process of environmental scanning with equal importance attached to all the scanning steps. Questionnaire survey is an economical and efficient way to enable us to obtain a broad picture of how Singapore firms scan their environment. Secondly, environmental scanning activities are guided by the managers' perceptions towards the external environment. A questionnaire would enable respondents to report their perceptions honestly while remaining anonymous. Thirdly, the quantitative survey data could be analyzed to statistically investigate the relationship between perceived strategic uncertainty and each scanning step in terms of their frequency and rate of interest. It will also help investigate the direct contribution of

environmental scanning through the users' perception towards the quality of environmental information ready for use.



**Figure 5:** Diagrammatic Illustration of the Research Design

According to NATAS (National Association of Travel Agents Singapore), there are 331 active members (NATAS, 2009). The directory provided by SFMA (Singapore Food Manufacturers' Association) shows a total of 297 food manufacturers (SFMA, 2009). "Purposeful sampling" will be used to select the respondents for the questionnaire survey. Purposeful sampling is based on informational but not statistical considerations. Its purpose is to maximize information, not facilitate generalization (Lincoln & Guba, 1985). In particular, "criterion sampling" is planned to be used, in which the researcher sets a criterion or a set of criteria and pick all cases that meet that criterion/those criteria (Patton, 1990). Specifically, the sample would be companies from the two industries fulfilling two criteria. Firstly, company manpower should be more than 20 employees. This is to ensure the



business as a sustainable entity and being able to conduct systematic environmental scanning activities. Secondly, the companies chosen shall operate in a single business domain thereby ensuring that they will focus on the task environment of their singular primary business, and not operating in multiple operating environments such as diversified firms.

Based on the general understanding acquired from the quantitative data analysis, face-to-face interview and focus group discussion are proposed to ensure the gathering of more profound data from different hierarchical levels within the firm. The potential interviewees of the study will be CEOs and staff engaged in ES activities of two leading companies from each of the two industries. The four companies would be selected after the completion of questionnaire survey.

Prior studies have found that scanning activities could be completed through staff from different functional units and at different hierarchical levels (Majid & Kowtha, 2008; Zhang & Majid, 2009). However, besides top management (e.g. chief executive officers, managing directors), prior studies have not paid sufficient attention to middle level managers or employees, who are likely to play an important role in the scanning process. For example, staff from the sales and marketing department may acquire information like existing customers' feedback and potential customers' requirements. They may synthesize this intelligence using their own knowledge, and communicate it to individuals involved in product development, for their further processing and use in new product design. Interviewing staff engaged in scanning activities with different functional roles and from various hierarchical levels would enable the researchers to acquire more in-depth data, and increase the chance of obtaining a more accurate and reliable overall picture of scanning activities. Moreover, the interview and focus group method would enable the researchers to explore more about the scanning activities conducted by the same company under different time periods through recall of various strategic situations. In addition, with the recognition of their indirect relationship, the contribution of scanning to organisational performance is also proposed to be investigated through this qualitative method.

## **Conclusion**

Environmental scanning could provide early warning signals for organizations, emerging from environmental uncertainties, risks, threats and opportunities. It could help companies develop and modify business strategies to meet changing external circumstances and hence improve their competitiveness and performance. In today's turbulent environment, it is

more desirable for organizations to conduct environmental scanning activities systematically and regularly.

In prior literature, the majority of studies investigating environmental scanning activities have mainly focused on the information collection step, with some easily measurable variables such as frequency of scanning, use of different kinds of information sources (personal and non-personal, internal and external) and scanned environmental sectors, while neglecting the other activities as needs identification, information processing, organizing, dissemination and utilization. Moreover, for studies attempting to discover or demonstrate the association between environmental scanning and business success, it is limited to measure organization's financial performance only, such as profitability, return on capital and net profit margin. The contribution of environmental scanning, in terms of reducing uncertainty and assisting strategic management and planning, may not be directly or immediately revealed in organizations' balance sheet, but it may have influences on firm's long-term growth and future development.

The common limitations of prior studies have been addressed in the proposed model through the highlighted environmental scanning steps and the indirect contribution of environmental scanning to organizational performance. Environmental scanning is re-defined and completed with the users' interpretation and evaluation of environmental information which is ready to use, without covering how this information is used by senior management for tactical or strategic decision making, and how the decision would be implemented. The reason for this exclusion is that several other factors such as leadership style, availability of resources and personal intuition can play a significant role in decision making. The direct contribution of environmental scanning could be evaluated through the users' perception towards the quality of environmental information that is captured, synthesised and ready for use. This will enable us to identify new factors relating to environmental scanning process, which will have a contributory role to play in enhancing the organisation's performance.

The majority of previous studies have investigated environmental scanning activities using quantitative methods such as questionnaire surveys or survey-based interviews. Only limited qualitative studies have used interviews, and these interviews were limited to the top management level. Our proposed research design expects to enrich this set of information by obtaining inputs across the hierarchy of the organisation thereby providing a richer and more accurate picture of environment scanning by the various stakeholders involved in this process.

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