



Scanning for competitive intelligence: a managerial perspective

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Abstract

Purpose – The purpose of this paper is to advance and investigate empirically how entrepreneurial attitude and normative beliefs influence managerial scanning for competitive intelligence and how managerial scanning efforts subsequently impact managerial interpretation of organizations' strengths and weaknesses in the competitive arena.

Design/methodology/approach – A structural equation model was tested with survey data from 309 managers in the USA.

Findings – The results indicate that entrepreneurial attitude orientation and market orientation significantly impact managerial scanning for competitive intelligence, which in turn leads to managerial representations of competitive advantage.

Research limitations/implications – This paper demonstrates that scanning for competitive intelligence is more an entrepreneurial activity than a routine activity for managers, and that managerial scanning efforts can be maximized in highly market-oriented organizations that value competitive intelligence collection and dissemination. Proactive scanning for competitive intelligence enables managers to develop a fuller picture of the superiority or deficiency of their organizations. Future research needs to address the inherent cyclicity of the managerial sense-making process.

Originality/value – This paper is the first effort to examine empirically the scanning cycle – that is, the relationships between managerial business motivation, intelligence scanning and sense-making. It offers strategic guides to both academicians and practitioners on how to achieve a better understanding of the complex and dynamic market through proactive scanning activities.

Keywords Competitive intelligence, Entrepreneurial attitude, Scanning, Market orientation

Paper type Research paper

Introduction

The market orientation perspective on marketing intelligence (Kohli and Jaworski, 1990; Slater and Narver, 1995) states that organizations should strive to achieve higher value and profits through marketing intelligence gathering and sharing across departments. Scanning for competitive intelligence is a major vehicle for organizations to obtain needed information for marketing intelligence generation and market adaptation (Patton and McKenna, 2005; Sawyerr *et al.*, 2000). Arguably, organizational competitive advantage rests on the ability of organizations to scan proactively for competitive intelligence and make effective responses (e.g. Brownlie, 1994; Oktemgil and Greenley, 1997; Pickton and Wright, 1998). However, scanning for competitive



intelligence alone does not enable organizations to adapt to the market. It is members within organizations who construct competitive perceptions and dictate strategic responses (Gray, 1994; Wright and Ashill, 1998). As Hambrick (1981, p. 299) suggested, scanning for competitive intelligence is “the managerial activity of learning about events and trends in the market”. The effectiveness of scanning behaviors determines managerial judgmental interpretation of the market.

Over the years, researchers have explored various antecedents and consequences of managerial scanning behaviors. Antecedents widely discussed include the sources (i.e. internal, external, personal, or impersonal sources) from which managers obtain information (e.g. Keegan, 1974; Kobrin *et al.*, 1980); the environmental segments (i.e. economic, technological, political or social segments) in which managers exert scanning efforts (e.g. Hambrick, 1981; O’Connell and Zimmerman, 1979); and the modes (i.e. inactive, reactive, or proactive mode) with which managers scan the market (e.g. El Sawy, 1985; Jain, 1984). More recently, an increasing number of researchers have examined the effect of managerial perceptions, such as perceived uncertainty and perceived source accessibility, on managerial scanning efforts (e.g. May *et al.*, 2000; McGee and Sawyerr, 2003; Sawyerr, 1993). Competitive strategy and organizational performance have been widely studied as strategic consequences of managerial scanning behaviors (e.g. Beal, 2000; Thomas *et al.*, 1993). Research findings suggest that managers rely mostly on personal and external sources for market information. Perceived uncertainty positively impacts the frequency and the scope of managerial scanning behaviors, and scanning of multiple market sectors enhances organizational competitive advantage.

Despite the findings on scanning behaviors from the “upper echelon” perspective, questions remain about why managers differ in their scanning behaviors and how managerial scanning for competitive intelligence subsequently impacts their interpretation of organizational competitive advantage. These questions raise three concerns in the current research. First, little is known about the attitudinal antecedent to managerial scanning behaviors, an exploration of which might reveal rich insights into aspects of the psychological scanning process. Second, as noted by Elenkov (1997), few studies have examined the influence of managers’ normative beliefs, embodied in organizational expectations and pressures, on managerial scanning behaviors. Third, with few exceptions (Thomas *et al.*, 1993), little research has examined the effect of scanning behaviors on managerial interpretation of organizational competitive advantage. Understanding managerial sense-making through managerial scanning efforts is of strategic importance to both academicians and practitioners since managerial interpretation of organizational strategic position in the complex and dynamic market directly influences action alternatives and subsequent outcomes.

The purpose of this study is to advance and investigate empirically how attitudinal and normative factors shape managerial scanning for competitive intelligence and how managerial scanning efforts subsequently influence managerial representations of competitive advantage. The “Research model” section of this paper outlines the constructs, the theoretical arguments, and the hypotheses among those constructs. The “Research method” section explains survey sample design, establishes the measurement scales, and presents the empirical findings of the hypothesized relationships. This paper concludes with discussions on the implications of the results, the limitations of the study, and possible avenues for future research.

The research model

In this study, the antecedents of the behavioral category of interest, i.e. scanning for competitive intelligence, and the cognitive consequence, i.e. managerial representations of competitive advantage, are integrated to develop a model (see Figure 1). The model seeks to describe the managerial sense-making process by examining the links between entrepreneurial attitude orientation, market orientation, competitive intelligence scanning, and managerial representations of competitive advantage.

Scanning for competitive intelligence

Scanning for competitive intelligence, as our behavioral category of interest, refers to the process of seeking and collecting information about events, trends, and changes beyond organizational boundaries to guide organizational strategic management (Aguilar, 1967). The systematic scanning of competitive intelligence, including noticing and interpreting competitive stimuli, is critical for organizations to stay abreast of changing market conditions and avoid costly mistakes (Anderson and Hoyer, 1991; Patton and McKenna, 2005).

Managers at all levels in organizations conduct competitive intelligence scanning to monitor market variables that are continuously shifting (Fielding, 2006). To sustain competitive position, managers must prepare to respond promptly to changes in customer preferences, competitor strategies, and technological advancements. Managerial responsiveness to the complex and dynamic market enables organizations to take various informed actions, ranging from defensive strategies in order to increase competitiveness to profiting from new market opportunities.

Two features of managerial scanning behaviors – the scope and the frequency of managerial scanning behaviors – are salient in previous research (e.g. Daft *et al.*, 1988). The scope of scanning represents the number of different market sectors monitored by managers. Market sectors refer to all sectors that have a direct influence on organizational goal setting and goal achievement. They are typically composed of competitor, customer, and technology sectors. The frequency of scanning behaviors reflects how often managers scan the market and determines the timeliness, relevancy, and the amount of competitive intelligence managers collect from various market sectors. Frequent scanning of market sectors allows managers to stay abreast of market trends and to adapt to market challenges and opportunities more rapidly than does infrequent scanning.

Competitive intelligence scanning is usually iterative and cumulative, and varies from person to person. The theory of reasoned action suggests that the causes of behavior can be traced back to a person’s attitude and normative beliefs (Ajzen and

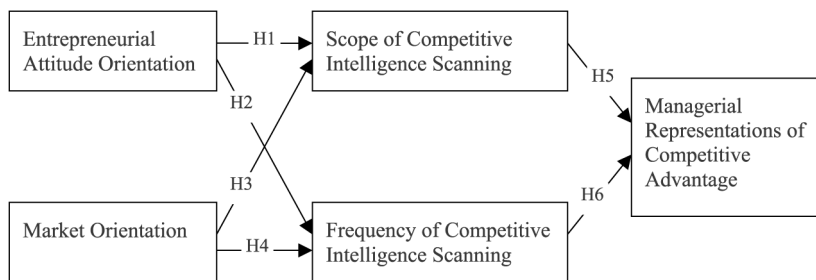


Figure 1.
The conceptual model of the effect of scanning behaviors on managerial representations of competitive advantage

Fishbein, 1980; Bagozzi, 1982; Fishbein and Ajzen, 1975). The attitudinal factor reflects one's judgmental attitude toward the behavior, while normative beliefs reflect one's perceived social pressures to perform or not to perform a specific behavior. The theory of reasoned action has been widely discussed in consumer research (Bang *et al.*, 2000; Eves and Cheng, 2007). For example, Eves and Cheng (2007) found that both consumers' attitude and their perception of others' views towards the new product significantly impact their intention to purchase the product. Drawing on the theory of reasoned action, we suggest that there are two antecedents of managerial scanning behaviors:

- (1) entrepreneurial attitude orientation; and
- (2) market orientation.

Entrepreneurial attitude orientation

Although many potential factors may affect managerial scanning for competitive intelligence, one of the most consistently important factors is entrepreneurial attitude orientation – managers' attitude towards the processes, practices, and decision-making activities that lead to new ways of solving problems (Lumpkin and Dess, 1996; Pellissier and Van Buer, 1996; Robinson *et al.*, 1991). Conceptually, entrepreneurial attitude orientation covers three dimensions commonly identified with business motivation:

- (1) need for achievement (Krauss *et al.*, 2005, Sagie and Elizur, 1999);
- (2) locus of control (Entrialgo *et al.*, 2000); and
- (3) innovation (Krauss *et al.*, 2005; Ramsey and Ibbotson, 2005).

Need for achievement refers to managerial desire to be successful (McClelland, 1961; Sagie and Elizur, 1999). Managers who are in a high level of need for achievement are moderate risk takers and prefer to take responsibility for their own decisions. Locus of control reflects managerial perception of outcomes as being within personal control and understanding or not (Ng *et al.*, 2006). Rotter (1966) suggests that two kinds of controls influence managerial action:

- (1) external; and
- (2) internal.

The perception of internal control is related to managers' beliefs that results are contingent upon their own behaviors or their own relatively permanent characteristics, while the perception of external control emphasizes the unpredictability of the situational forces around managers. Managers with the perception of internal control tend to take initiatives to control the environment. In contrast, managers with the perception of external control prefer to accept their role passively and go with the flow. They believe that outcomes are not entirely contingent upon their action. Instead these outcomes are the result of luck, chance or fate, or being under the control of others. Innovation represents managerial tendency to support and engage in creative ideas, process, and experimentation (Krauss *et al.*, 2005). Managers with a high level of innovation tend to depart from existing practices and explore new and unique ways of solving problems within the organization.

Entrepreneurial attitude orientation represents managerial business motivation and goal setting. Different levels of entrepreneurial attitude orientation have important implications for managerial scanning behaviors. This is demonstrated in the fact that while some managers obtain competitive intelligence passively, others engage in an active search for competitive intelligence. Opportunities or threats can arise from many different market sectors. Securing information across several market sectors provides managers with a panoramic view of the competitive arena and keeps them informed of customer demand and latent buying desires, technological advances, economic situations, and rivals' competitive actions, such as new product introductions and pricing campaigns. Managers with a high level of need for achievement, locus of control and innovation have a strong motivation to monitor the market (McClelland, 1987b; Swierczek and Thanh Ha, 2003). Their strong motivation leads to their intensive practices to seek competitive intelligence (Entrialgo *et al.*, 2000; Krauss *et al.*, 2005). Therefore, we hypothesize:

H1. Managers' entrepreneurial attitude orientation has a positive relationship with their scope of competitive intelligence scanning.

Managers with a high level of need for achievement, locus of control and innovation tend to rigorously scrutinize situational variables and seek opportunities from the market. More specifically, managers who desire to be successful, to control the environment, and to be innovative, have a strong motivation to conduct frequent scanning for competitive intelligence. In contrast, managers characterized by a low level of need for achievement, locus of control, and innovation, have little motivation to learn new things (McClelland, 1987b; Sagie and Elizur, 1999). They usually accept their role passively and have a reactive attitude towards market changes (Locke and Latham, 1990; McClelland, 1987a). Their scanning for competitive intelligence tends to be irregular and unstructured, and merely responds passively to changing market conditions (Bateman and Crant, 1993; Covin and Covin, 1990). Therefore, we hypothesize:

H2. Managers' entrepreneurial attitude orientation has a positive relationship with their frequency of competitive intelligence scanning.

Market orientation

In contrast to entrepreneurial attitude orientation at the individual level, managerial subjective norms reflect values at the collective level. These deeply rooted values are related to perceived social pressures to perform or not to perform a specific behavior. According to Gray (1988, p. 4), "values at the collective level, as opposed to the individual level, represent culture". Research suggests that organizational cultural orientations toward competitive intelligence can be well captured by organizational market orientation (Deshpande *et al.*, 1993; Han *et al.*, 1998).

Market orientation reflects the organizational standards and expectations for competitive intelligence generation and dissemination (e.g. Gresham *et al.*, 2006; McDonald and Madhavaram, 2007; Murray *et al.*, 2007). Narver and Slater (1990, p. 21) define market orientation as "the organizational culture that most effectively and efficiently creates the necessary behaviors for the creating of superior value for buyers and thus continuous superior performance for the business". They suggest that market-oriented organizations are embodied with a culture in which employees are

expected to provide consistent efforts to accommodate customer needs through information gathering and sharing across departments (Slater and Narver, 1994; Vorhies *et al.*, 1999). Researchers have found that market orientation positively impacts both business performance (e.g. Connor, 2007; Narver and Slater, 1990) and new product success (Slater and Narver, 1994). Market orientation, coupled with an entrepreneurial drive, also leads to a learning organization that can create knowledge through information from the market and the competitors (Slater and Narver, 1995).

Market orientation reflects the shared values of organizational members. The shared values of being market-oriented can drive organizational members' fundamental strategies and behaviors (Carr and Lopez, 2007). Organizational members in highly market-oriented organizations place a priority on scanning for competitive intelligence and they advocate an organization-wide commitment to maximize customer value through competitive intelligence gathering and sharing (Cervera *et al.*, 2001; McDonald and Madhavaram, 2007). Therefore, we argue that managers in highly market-oriented organizations tend to engage in more proactive competitive intelligence scanning, while managers in less market-oriented organizations lack motivation to exert scanning efforts:

- H3.* Market orientation has a positive relationship with the scope of managerial scanning for competitive intelligence.
- H4.* Market orientation has a positive relationship with the frequency of managerial scanning for competitive intelligence.

Managerial representations of competitive advantage

We examine managerial representations of competitive advantage as the cognitive outcome of managerial scanning for competitive intelligence. Representations of competitive advantage refer to managers' mental models on organizations' competitive strength and weakness in the market (Porac and Thomas, 1990). The conventional view of managerial sense-making (Hofer and Schendel, 1978) claims that managers are well informed of various tangible and independent entities in the market. Managers rationally rely on their conceptual frameworks to identify opportunities and parry threats. However, the revisionist view (Smircich and Stubbart, 1985) highlights the perceptual and cognitive aspects of managerial decisions. The revisionist view argues that managers have bounded rationality when dealing with competitive intelligence and managerial mental representations of the market are not unified.

According to the revisionist view, managerial representations of competitive advantage vary in the content and structure from person to person since managers have different ways to seek and process information. Day and Nedungadi (1994) suggest that managerial representations of competitive advantage range from partial dimensions to multiple dimensions. Specifically, managerial representations of competitive advantage dominated by one or two dimensions (for example, customer-focused or competitor-focused) reflect biased or partial views of organizational strategic position. In contrast, those managers with multidimensional representations of organizational strategic position have a fuller picture of the superiority or deficiency of their organizations.

Managers usually develop a knowledge-consistent representation of experience through actively selecting and modifying their knowledge framework. Competitive

intelligence gathered from scanning provides managers with a cognitive framework of the strategic position of their organizations in the marketplace. This cognitive framework helps managers decide where and how their organizations can attain a competitive advantage. Rigorous scanning practices furnish managers with information about events and trends that may affect the survival and prosperity of the organization. Therefore, managers with a high frequency and a wide scope of scanning behaviors are in a better position to develop a fuller picture of the superiority or deficiency of their organizations and to build multidimensional representations of competitive advantage for their organizations. In contrast, managers with irregular and unstructured scanning behaviors might end up focusing on one or two dimensions (for example, customer-focused or competitor-focused) of competitive advantage of their organizations. The narrow view of organizational strategic position reflects partial representations of competitive advantage. Therefore, we hypothesize:

- H5. The scope of competitive intelligence scanning has a positive relationship with managerial representations of competitive advantage.
- H6. The frequency of competitive intelligence scanning has a positive relationship with managerial representations of competitive advantage.

Research method

Data collection

The sample for this study came from two professional associations in the USA:

- (1) the Society of Competitive Intelligence Professionals; and
- (2) the American Marketing Association.

The Society of Competitive Intelligence Professionals contains member information of competitive intelligence practitioners, while the American Marketing Association contains member information of marketing practitioners. The two associations were selected based on the fact that members in these two associations work in a variety of departments that require competitive scanning as their daily routine. For example, research has demonstrated that the competitive intelligence function is mostly done in the marketing and sales department (Antia and Hesford, 2007; Pelsmacker *et al.*, 2005). Collecting data from members with different position backgrounds helps to reduce the selection bias (Burnham and Anderson, 2003).

We randomly selected a master list of around 3,000 managers and their e-mail addresses from the two membership rosters. We then set up an online survey through a commercial survey support site to collect data. A personalized e-mail with instructions and a link to the online survey were sent to each manager. As an incentive for participating, the respondents were informed that in return for completing the survey, they would receive a general report of the results. The data collection continued for two months. A total of 312 respondents completed and submitted the survey, yielding a response rate of 10.4 percent[1]. Valid responses came from 309 managers since three responses were unusable. The profiles of the 309 managers for the final sample are given in Table I.

Data showed that respondents take different managerial responsibilities in the organizations. We assessed the effect of managers' positions in the organization on all of the measured variables before the data analysis. Results of ANOVA indicated that

	Count	Percentage
<i>Company market value (\$US)</i>		
< 10 million	31	15.74
10 million-500 million	45	22.84
500 million-2 billion	32	16.24
2 billion-10 billion	37	18.78
10 billion-50 billion	35	17.77
> 50 billion	17	8.63
Total	197	
Minimum	0.3 million	
Maximum	80 billion	
<i>Company annual gross revenue (\$US)</i>		
< 100 million	115	41.8
100-500 million	51	18.5
500-1,000 million	20	7.3
1,000-1,500 million	13	4.7
1,500-2,000 million	18	6.5
> 2,000 million	58	21.1
Total	275	
<i>Experience (years)</i>		
< 2	57	19.59
2-3	58	19.93
3-4	44	15.12
4-5	37	12.71
5-10	66	22.68
> 10	29	9.97
Total	291	
Mean	4.43	
Median	3.50	
Minimum	0	
Maximum	29	
<i>Position</i>		
CI manager	96	33.57
Marketing manager	53	18.53
Business analyst	42	14.69
President	24	8.39
Project manager	8	2.80
Other	63	22.03
Total	286	

Table I.
Profile of final sample of
309 managers (182 male,
62.76 percent; 108 female,
37.24 percent)

there is no significant difference in responses among different groups of managers on any of those variables.

To assess the possibility of non-response bias, we used the extrapolation procedure by Armstrong and Overton (1977). Specifically, we split the data into two parts according to the date of online survey submission (Yin and Paswan, 2007). The first 75 percent of responses (232 responses) were classified as “early” and the last 25 percent (77 responses) as “late” respondents. We used the latter 25 percent to represent non-respondents. *t*-Tests were applied to all of the measured variables as well as the background variables of managerial experience (years in the managerial position), age,

position, companies' market value and annual gross revenue to reveal any significant differences between the early and the later respondents. No significant difference was found between the two groups on any of these variables, indicating that non-response bias was not a problem for the analysis (Murphy and Daley, 1996; Yin and Paswan, 2007).

Measures of constructs

The measures employed in the study were developed from previous literature (see the Appendix). The detailed description of the scales is as follows.

Entrepreneurial attitude orientation (EAO). We developed the entrepreneurial attitude orientation scale based on Robinson *et al.*'s (1991) scale. Practical considerations – most notably the length of Robinson *et al.*'s (1991) scale (75 items) – led to the decision not to administer the entire scale. We conducted a survey pretest to reduce the number of items to a manageable number with a random sample of 298 undergraduate business students. The modified entrepreneurial attitude orientation scale contains a total of 15 items with three dimensions delineated as need for achievement (NA) (four items), locus of control (LC) (six items), and innovation (IN) (five items). The three dimensions in the modified scale were highly correlated with Robinson *et al.*'s (1991) measurement of need for achievement ($\rho = 0.92$), locus of control ($\rho = 0.89$), and innovation ($\rho = 0.90$).

Market orientation (MO). We adopted Narver and Slater's (1990) scale to measure market orientation as a culture or value system. Narver and Slater's (1990) scale contains 15 items, capturing three components of market orientation: customer orientation (CO), competitor orientation (PO), and interfunctional coordination (IC).

Competitive intelligence scanning. We adapted Beal's (2000) scale to measure both the scope and the frequency of managerial scanning for competitive intelligence. The scope of scanning (SS) scale asked respondents how extensively they scan information from six market sectors:

- (1) customer;
- (2) supplier;
- (3) competitor;
- (4) company resources;
- (5) technology; and
- (6) socioeconomic sectors.

The frequency of scanning (FS) scale contained 27 items, which asked respondents how frequently they scan each of the six sectors:

- (1) customer (CM) (three items);
- (2) competitor (CP) (five items);
- (3) supplier (SU) (three items);
- (4) company resources (CR) (six items);
- (5) technology (TH) (two items); and
- (6) socioeconomic (SE) (eight items) sectors.

Managerial representations of competitive advantage (RE). We developed the managerial representations of competitive advantage scale based on Day and Nedungadi's scale (1994). The scale contains six items asking respondents to indicate directly how they rely on competitors, customers, company resources, supplier information, technology information, or social and political information to assess the degree and type of the competitive advantage of their businesses.

We conducted Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test before we conducted factor analysis of the scales. The KMO statistics need to be greater than 0.5 for a factor analysis to proceed (Kaiser, 1974). Our findings showed that Bartlett's test of sphericity for all scales is significant and the KMO statistics ranged from 0.62 to 0.91. Next, we conducted principal component analysis of the scales and checked the loadings of scale items. We found that the factor loadings of three items of market orientation were below 0.30. According to Hair *et al.* (1998), factor loadings above 0.50 are preferable and factor loadings above 0.30 are considered minimally acceptable for a sample size of 309. Therefore, we removed these three items from our final analysis. The factor loadings of all other items were highly significant. Composite reliabilities were 0.86 for entrepreneurial attitude orientation, 0.91 for market orientation, 0.82 for scope of scanning behaviors, 0.94 for frequency of scanning behaviors, and 0.73 for managerial representations of competitive advantage.

Structural equation analysis

Means, standard deviations, kurtosis, and correlations between the measures are shown in Table II. We checked the normality of the data by examining kurtosis statistics of the scales and their standard error. We found that normality was not a problem for the analysis since kurtosis statistics of all scales were less than twice of their standard error and Mardia's coefficient was 1.32 (Tabachnick and Fidell, 1996; Mardia, 1970). We also found that there is no outlier in the data set since all statistics of Mahalanobis distance are in the acceptable range (Johnson and Wichern, 2007).

A test of missing completely at random (MCAR) was used to evaluate the randomness of missing data before we conducted structural equation modeling (Hair *et al.*, 1998). The test showed an insignificant result ($p > 0.05$), which demonstrated that missing values were randomly scattered. Since the proportion of the responses with missing values was small, we followed Little and Rubin's (1987) recommendation on using a maximum likelihood estimation method for the analysis of the data with missing values. We conducted a structural equation model with AMOS 6.0 in SPSS and used composite indicators for entrepreneurial attitude orientation, market orientation, and frequency of scanning behaviors to simplify the structural model (Bollen, 1989). The full structural equation model is portrayed in Figure 2.

We present the results from the structural analysis in Table III. There is no clear and agreed upon evaluation criterion to decide whether a specific model is good enough or not. As McDonald (1999, p. 171) notes, "the status and utility of the goodness-of-fit indexes and any 'rule of thumb' for them are still unsettled, and it may be questioned whether their use is at all desirable". Setting aside the question of how valuable goodness-of-fit indices truly are, our study follows three general suggested guidelines for assessing structural models (e.g. Kline, 1998; McDonald, 1999), indicated by chi-square to df ratio (χ^2/df), comparative fit index (CFI) and root mean squared error

Table II.
Descriptive statistics and correlations among study variables

	Mean	SD	Kurtosis	NA	LC	IN	CUO	CMO	IC	CMI	CPI	MAI	CUI	TKI	SOC	SSB
EAO																
NA	5.85	1.35	0.91													
LC	5.31	1.30	0.78	0.30**												
IN	5.43	1.45	-0.25	0.28**	0.75**											
MO																
CO	5.12	1.18	0.44	0.21**	0.21**	0.29**										
PO	5.01	1.21	-0.47	0.21**	0.33**	0.67**										
IC	4.96	1.20	-0.29	0.19**	0.26**	0.31**	0.70**									
FS																
CM	5.36	1.23	0.65	0.40**	0.20**	0.21**	0.26**	0.37**	0.24**							
CP	5.39	1.26	-0.06	0.41**	0.24**	0.25**	0.42**	0.43**	0.39**	0.56**						
SU	3.29	1.63	-0.81	0.21**	0.15*	0.12*	0.12*	0.21**	0.09	0.42**	0.34**					
CR	4.70	1.33	-0.18	0.40**	0.23**	0.24**	0.24**	0.45**	0.30**	0.65**	0.56**	0.56**				
TH	4.34	1.77	-0.80	0.23**	0.21**	0.11	0.17**	0.23**	0.13*	0.57**	0.43**	0.58**	0.61**			
SE	4.35	1.42	-0.56	0.43**	0.28**	0.17**	0.21**	0.27**	0.25**	0.37**	0.44**	0.41**	0.53**	0.43**		
SS	3.78	1.40	-0.86	0.34**	0.21**	0.14*	0.15**	0.21**	0.21**	0.35**	0.36**	0.27**	0.39**	0.31**	0.81**	
RE	5.05	1.47	0.77	0.25**	0.20**	0.29**	0.32**	0.39**	0.28**	0.30**	0.40**	0.30**	0.47**	0.27**	0.40**	0.33**

Notes: 309 respondents completed the survey. The items corresponding to each construct/dimension were summed and averaged in order to obtain a summated index. The summary statistics are reported for this index. * $p < 0.05$, ** $p < 0.01$

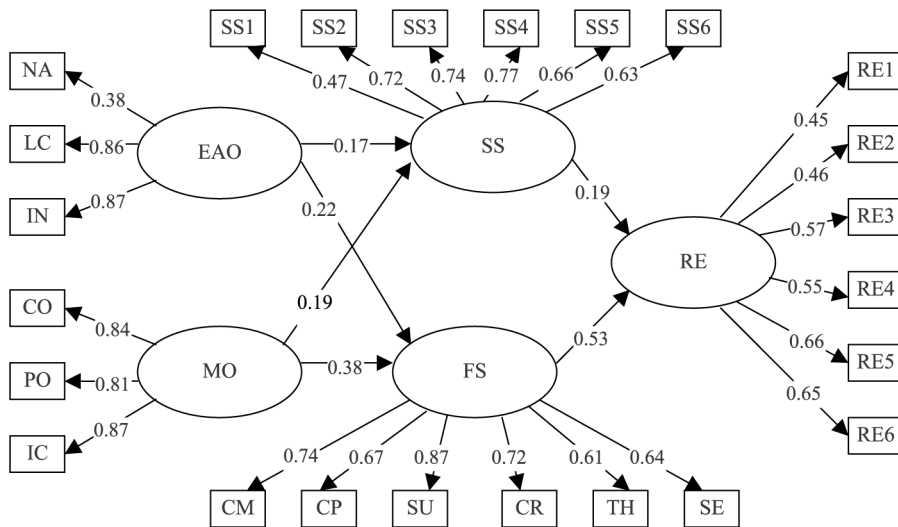


Figure 2. The results of the structural model of the effect of scanning behaviors on managerial representations of competitive advantage

of approximation (RMSEA). For a “good” model, chi-square to df ratio should be less than 3 (Kline, 1998). CFI should be greater than 0.9 and it is desirable that RMSEA should be smaller than 0.05 (McDonald, 1999). Anyhow, if RMSEA is smaller than 0.08, it is still deemed acceptable (McDonald, 1999). Our results indicate that the data fit the model acceptably ($\chi^2 = 537.87$, $df = 245$, $NFI = 0.96$, $CFI = 0.95$, $RMSEA = 0.08$).

Our analysis showed that managerial entrepreneurial attitude orientation significantly impacts both the scope of competitive intelligence scanning ($\beta = 0.17$, $p < 0.05$) and the frequency of competitive intelligence scanning ($\beta = 0.22$, $p < 0.01$). The findings supported *H1* and *H2*. More specifically, managers with high levels of need for achievement, with locus of internal control, and with a strong motivation to seek innovative ideas scan competitive intelligence more frequently and more extensively than managers with low levels of need for achievement, with locus of external control, and with a weak motivation to seek innovative ideas.

We also found that market orientation significantly impacts the scope of scanning behaviors ($\beta = 0.19$, $p < 0.05$) and the frequency of scanning behavior ($\beta = 0.38$, $p < 0.01$). Therefore, *H3* and *H4* were supported. The findings demonstrated that normative beliefs play a significant role in predicting managerial scanning for competitive intelligence. Managers in highly market-oriented organizations scan competitive intelligence more frequently and more extensively than managers in less market-oriented organizations.

As predicted, there is a significant positive relationship between managerial scope of scanning behaviors and representations of competitive advantage ($\beta = 0.19$, $p < 0.05$). The findings supported *H5* and indicated that managers who scan a wider scope of market sectors establish fuller representations of competitive advantage than those managers who scan a smaller scope of market sectors. We also found a highly significant relationship between frequency of scanning behaviors and managerial representations of competitive advantage ($\beta = 0.53$, $p < 0.01$). The findings demonstrated that managers who scan the market more frequently rely more on the

		Standardized parameter estimates (<i>t</i> -values)
<i>Structural coefficients</i>		
EAO → FS		0.22 (2.97)
EAO → SS		0.17 (2.39)
MO → FS		0.38 (5.16)
MO → SS		0.19 (2.76)
FS → RE		0.53 (4.88)
SS → RE		0.19 (2.57)
<i>Measurement coefficients</i>		
NA → EAO		0.38*
LC → EAO		0.86 (5.90)
IN → EAO		0.87 (6.04)
CO → MO		0.84*
PO → MO		0.81 (15.27)
IC → MO		0.87 (16.94)
SS1 → SS		0.47*
SS2 → SS		0.72 (7.32)
SS3 → SS		0.74 (7.65)
SS4 → SS		0.77 (7.47)
SS5 → SS		0.66 (7.23)
SS6 → SS		0.63 (7.18)
CM → FS		0.74*
CP → FS		0.67 (11.13)
SU → FS		0.87 (14.00)
CR → FS		0.72 (11.75)
TH → FS		0.61 (9.60)
SE → FS		0.64 (10.18)
RE1 → RE		0.45*
RE2 → RE		0.46 (5.42)
RE3 → RE		0.57 (6.15)
RE4 → RE		0.55 (5.76)
RE5 → RE		0.66 (6.31)
RE6 → RE		0.65 (6.25)
<i>Goodness of fit statistics</i>		
χ^2		537.87
df		245
NFI		0.96
CFI		0.95
RMSEA		0.08
R^2 for RE		0.43

Table III.
Parameter estimates for
measurement relations
and causal paths^a

Notes: All parameter estimates are significant at $p < 0.05$. *The unstandardized coefficient corresponding to this parameter was set to equal 1.00 to fix the scale of the latent variable

collected information in assessing their organizational competitive positions than managers who scan the market less frequently. Thus, *H6* was supported.

To summarize, the findings demonstrated the robustness of the structural model and all six hypotheses were validated. The results demonstrated that market orientation and entrepreneurial attitude orientation promote managerial scanning for

competitive intelligence, which in turn facilitate managerial interpretation of organizations' strength and weakness in the competitive arena.

Discussion

The study was motivated by a desire to understand why managers differ in their scanning efforts and what implications scanning for competitive intelligence may have for managerial interpretation of organizational competitive advantage. Scanning for competitive intelligence requires managers to collect information from meaningful sectors of the market, monitor emerging trends, and evaluate the impact of situational changes on strategic decisions. Our results suggest that managers with a high level of entrepreneurial attitude orientation engage in more proactive scanning for competitive intelligence than those managers who demonstrate a low level of business motivation. We also revealed that market orientation significantly impacts the frequency and the scope of managerial scanning behaviors. Previous research has focused on the impact of a dichotomized organizational culture (with authoritarian or participative element) on managerial scanning efforts (Lauzen, 1995). The dichotomized organizational culture promotes the understanding of the organization itself, but fails to take into account the active role organizational members play in the organization. Our findings highlight the fact that managers are embedded in organizations and they are significantly influenced by the cultural orientation of organizations. Highly market-oriented organizations provide a supportive culture for managers to commit to proactive scanning for competitive intelligence. In contrast, less market-oriented organizations discourage managers from conducting rigorous scanning for competitive intelligence.

The study also demonstrates that managerial representations of competitive advantage are influenced by managerial scanning efforts. Proactive scanning for competitive intelligence furnishes managers with knowledge about customers' needs and competitors' products, services, prices, etc. Managers' knowledge of customer and competitive actions enables them to better assess the strength and weakness of their organizations, which leads to better representations of competitive advantage.

From a managerial standpoint, the study presents insights into three important areas for managers who are responsible for identifying opportunities and threats through collecting competitive intelligence from the rapidly changing market. First, the demonstrated predictive power of entrepreneurial attitude orientation on managerial scanning for competitive intelligence reveals the fact that competitive intelligence scanning is more an entrepreneurial activity than a routine activity for managers. Proactive scanning behaviors are always conducted by those managers who are innovative, have a strong desire to be successful, and have a strong business motivation in monitoring the external market. Second, managers in highly market-oriented organizations are in a better position to conduct frequent and extensive scanning for competitive intelligence since highly market-oriented organizations provide a strong supportive culture for competitive intelligence collection and dissemination. This means that managerial scanning efforts can be maximized in organizations that value competitive intelligence on customers and competitors. Third, managerial representations of competitive advantage are not formed in a vacuum; rather, they are influenced by the proactive activities with which managers scan for competitive intelligence. Managers need to conduct proactive

competitive intelligence scanning before they can understand the impact of market forces on their organizations and develop effective mental representations of the strength and weakness of their organizations.

This study synthesizes interdisciplinary research on entrepreneurship, competitive intelligence, and the formation of managers' mental models, offering new insight into managerial sense-making. However, a limitation should be noted: the study ignores the nonlinear aspect of the managerial sense-making process. We articulate and test a set of linear relationships by a procedural cognitive approach without examining the inherent cyclicity of the cognitive process. The cognitive processes in the mind set are not necessarily procedural and may cascade over time. For example, managerial representations of competitive advantage are constantly evolving. They are not only affected by managerial scanning behaviors, but also can alter managerial scanning behaviors.

The limitations of the study point to future research opportunities. Future research might use longitudinal data to examine the nonlinear relationships between managerial scanning efforts, managerial cognitive framework of competitive advantage, managerial strategic decision making, and decision outcomes. As Thomas *et al.* (1993) suggested, a multi-year time frame may be able to tap each cognitive stage in the scanning cycle. Future research might also address the fundamental questions of appropriate methodologies in the field of managerial cognition. Most methods with a cognitive stance, such as repertory grid, causal maps, and taxonomic interview procedures, are still embryonic in their development. Although these diverse methods provide better ways to identify the variations in the cognitive dimensions of individual managers, adopting different methods might lead to complementary or even conflicting results with regard to managerial cognition. How to incorporate these methods in the study of managerial scanning cycles and clarify the similarities and differences of those methods through subsequent research findings is worthy of serious study.

Note

1. The online survey was designed in multiple pages. According to the summary statistics provided by the commercial survey support site, 125 respondents started working on the survey, but failed to finish and submit the survey. Due to the special nature of web surveys, we obtained no information on those respondents.

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Items	Standardized factor loadings
<i>Entrepreneurial attitude orientation (EAO)^a (percentage variance explained = 61.12)</i>	
Need for achievement (NA)	
I feel proud when I look at the results I have achieved in my business activities	0.68
I get a sense of accomplishment from the pursuit of my business opportunities	0.76
I feel good when I have worked hard to improve my business	0.73
I always feel good when I make the organizations I belong to function better	0.64
Locus of control (LC)	
I make a conscientious effort to get the most out of my business resources	0.61
To be successful I believe it is important to use your time wisely	0.85
I believe that any organization can become more effective by employing competent people	0.89
I get excited creating my own business opportunities	0.87
I believe that in the business world the work of competent people will always be recognized	0.82
Even though I spend some time trying to influence business events around me every day, I have had very little success (R)	0.87
Innovation (IN)	
I believe it is important to approach business opportunities in unique ways	0.74
I believe that to become successful in business you must spend some time every day developing new opportunities	0.71
I enjoy being able to use old business concepts in new ways	0.73
I believe it is important to continually look for new ways to do things in business	0.74
I usually seek our colleagues who are excited about exploring new ways of doing things	0.74
<i>Market orientation (MO)^a (percentage variance explained = 52.32)</i>	
Customer orientation (CO)	
Our business objectives are driven by customer satisfaction	0.85
We closely monitor and assess our level of commitment in serving customers' needs	0.84
Our competitive advantage is based on understanding customers' needs	0.80
Our business strategies are driven by the goal of increasing customer value	0.85
We pay close attention to after-sales service	0.68
We measure customer satisfaction systematically and frequently ^d	
Competitor orientation (PO)	
We respond rapidly to competitive actions	0.83
We target customers where we have an opportunity for competitive advantage	0.85
Top management regularly discusses competitors' strength and weaknesses	0.78
Our salespeople regularly share information within our business concerning competitors' strategies ^d	
Interfunctional coordination (IC)	
Our top managers from each business function regularly visit our current and prospective customers	0.78

(continued)

Table AI.
Scale items and factor loadings

Items	Standardized factor loadings
We freely communicate information about our successful and unsuccessful customer experiences across all business functions	0.77
All of our functions are integrated in serving target markets	0.76
Our managers understand how employees can contribute to value of customers	0.80
We share resources with other business units ^d	
<i>Scope of scanning behavior (SS)^b (percentage variance explained = 68.15)</i>	
Customer sector (SS1)	0.59
Competitor sector (SS2)	0.79
Supplier sector (SS3)	0.64
Company resources (SS4)	0.63
Technology sector (SS5)	0.61
Socioeconomic sector (SS6)	0.71
<i>Frequency of scanning behaviors (FS)^c (percentage variance explained = 73.85)</i>	
Customer information (CM)	
Customers' buying habits	0.85
Customers' product preferences	0.87
Customers' desires and demands	0.84
Competitor information (CP)	
Competitors' prices	0.73
Competitors' introduction of new products	0.88
Competitors' product improvements	0.91
Competitors' entry into new markets	0.86
Competitors' improvements in manufacturing processes	0.59
Supplier information (SU)	
Availability of raw materials or components	0.83
Availability of external financing	0.85
Availability of labor	0.81
Company information (CR)	
Company's manufacturing capabilities/resources	0.62
Company's research and development capabilities/resources	0.79
Company's advertising/promotion capabilities/resources	0.78
Company's sales capabilities/resources	0.84
Company's financial capabilities/resources	0.85
Company's financial capabilities/resources	0.85
Technology information (TH)	
New manufacturing technology	0.79
New product technologies	0.79
Social, political and economic information (SE)	
Local social conditions	0.79
National social conditions	0.83
Local economic conditions	0.83
National economic conditions	0.83
Global economic conditions	0.78
Local political conditions	0.87
National political conditions	0.90
Global political conditions	0.85

Table AI.

(continued)

Items	Standardized factor loadings
<i>Representation of competitive advantage (RE)^b (percentage variance explained = 43.31)</i>	
Competitive information (judgmental comparison by management of your costs, performance and capabilities relative to your competitors) (RE1)	0.72
Customer information (RE2)	0.73
Company (internal) capabilities and resources information (RE3)	0.59
Technology information (RE4)	0.58
Supply information (RE5)	0.63
Social and political information (RE6)	0.69

Notes: All loadings are significant at $p < 0.05$. R = reverse scored. ^aSeven-point scale (1 = “strongly disagree” and 7 = “strongly agree”). ^bSeven-point scale (1 = “to no extent” and 7 = “to very great extent”). ^cSeven-point scale (1 = “never” and 7 = “continuously”). ^dItems were dropped from the scale during the measure purification phase

Table AI.

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