

Deep Scanning: Using Environmental Assessment to Create Competitive Advantage

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Abstract

Recent financial crises have been partially blamed on the “unknowability” of environmental factors. They could be the result of overconfidence in our mental models for environmental scanning, a failure to account for perceptual and decision biases, and a failure to identify what should have been evident in a turbulent worldwide business environment. By coming to appreciate perceptual roadblocks and errors and designing an organizational scanning process that actively searches for the unknown, sustainable competitive advantages can be created. This paper summarizes some perceptual errors inherent in day-to-day organizational leadership and makes practical recommendations for ameliorating their impact on decisions. It also introduces a model for identifying environmental “unknown unknowns” and using them to create sustainable competitive advantages.

Keywords: environment, scanning, competition

Background

A Great intelligence officer studies the unknown and works in the darkness, trying to see the shape of future events. He covers the sensitive ground where prejudice, or instinctive cultural bias, often meet reality, and he must stand for reality, even if it means standing virtually alone. Great intelligence officers often have the melancholy job of telling their superiors things they don't want to hear. A great intelligence officer tries to make the unknown at least partially known; he tries to think like his enemy, and he listens carefully to those with whom he disagrees, simply because he knows that he has to challenge his own value system in order to understand the nature and impulse of the other side. (Halberstram (2007), p. 378)

“In 1997, Brooksley Born [Commodity Futures Trading Commission Commissioner] warned in congressional testimony that unregulated trading in derivatives could ‘threaten our regulated markets or, indeed, our economy without any federal agency knowing about it.’ Born called for greater transparency--disclosure of trades and reserves as a buffer against losses” (vanden Heuvel, 2008).

I think some of the best financial minds in the country didn't see it coming. We saw that five key investment banks in New York are no more, or have been transformed in a major way. They're folks that deal in this area all day, every day, and they didn't foresee it coming. VP Richard Cheney in an interview with Jim Lehrer on January 14, 2009.

“No, we didn't see it [the collapse] coming,” President George W. Bush on Larry King Live, January 13, 2009.

Somebody saw it coming, as evidenced by the above statements. Were the current crises in world businesses and structures unforeseen, unforeseeable, or were they simply ignored by managers too entrenched in old ways of thinking to see the coming change? Although all of the causes associated with recent crises in banking, mortgage markets, and manufacturing are not completely clear, some factors probably included overconfidence, resistance to change and in the case of mortgages, and the belief that real estate values would never decline. An overconfident belief in the permanence of the status quo and a failure to identify and plan for the “unknown unknowns” in a turbulent worldwide business environment may have led to self-deception of so-called “sophisticated investors” who suffered from the “illusion of control.” These illusions may have been created by perceptual errors. In 2003 Secretary of Defense Donald H. Rumsfeld infamously said:

Reports that say that something hasn't happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns -- the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries, it is the latter

category that tend [sic] to be the difficult ones [sic]. (Department of Defense News Briefing, 2002)

Although Rumsfeld was roundly criticized for the comment, his idea was not a new concept in addressing either human behavior or strategic planning.

The Johari Window developed by Joseph Luft and Harry Ingram (1955) presents a model of behavior and communication that is divided into four quadrants depending on factors that are known or unknown to an individual and the people with whom he or she is interacting.

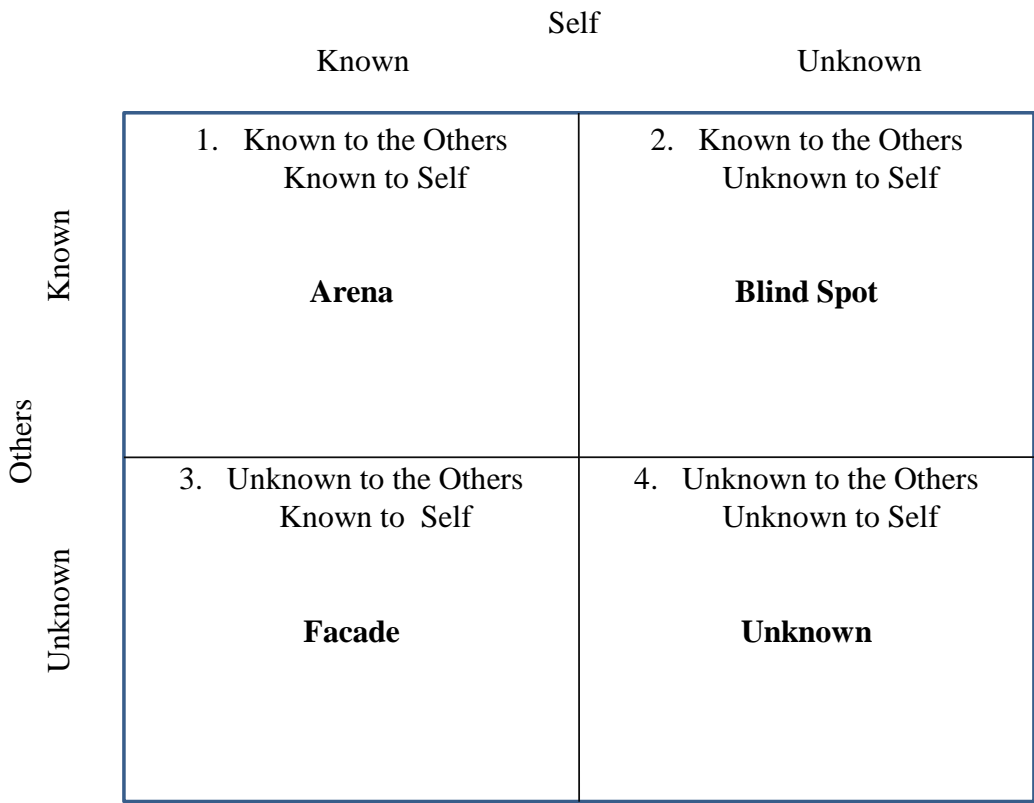


Figure 1: The Johari Window (Luft & Ingram, 1955)

The lower right quadrant, called “Unknown” by the authors, is, in effect, the intersection of “Unknown to Self” and “Unknown to Others,” which is the Unknown Unknown. That concept can be applied to analysis of the organizational environment, as well as the original intent of the application to address interpersonal communication relationships.

Organizational strategy, much of which is derived, in large part, from concepts of military strategy, presents a concept of unknown unknowns that goes at least as far back as the 19th

century Prussian military theorist Carl Von Clausewitz. Lieutenant General Robert Furlong (1984) notes that:

To those things Clausewitz wrote about uncertainty and chance, I would add a few comments on unknown unknowns--those things that a commander doesn't even know he doesn't know. Participants in a war game would describe an unknown unknown as unfair, beyond the ground rules of the game. But real war does not follow ground rules, and I would urge that games be "unfair" by introducing unknown unknowns.
(<http://www.airpower.maxwell.af.mil/airchronicles/aureview/1984/jul-aug/furlong.html>)

The extension of this idea of introducing unknown unknowns into war gaming is that in organizational planning we must also learn to anticipate and deal with unknown unknowns. To not do so would be to fail to consider that which exists in the organizational environment. Failing to analyze the environment may result in the perception that the environment has become a "turbulent field" (Emery & Trist, 1990) which is characterized by "a gross increase in [the] area of relevant uncertainty" (p. 242).

In describing the causal texture of the organizational environment Emery and Trist (1990) outlined four types of environments ranging from random, placid through turbulent fields. The turbulent field is described as having:

[D]ynamic properties arising not simply from the interaction of identifiable component systems but from the field itself (the 'ground').... The turbulence results from the complexity and multiple character of the causal interconnections. Individual organizations, however large, cannot adapt successfully simply through their direct interactions. An examination is made of the enhanced importance of values, regarded as a basic response to persisting areas of relevant uncertainty, as providing a control mechanism, when commonly held by all members in a field. (p. 246)

There has been much said about the deregulation of banking and other businesses and loss of control and oversight. It can be readily seen that the reduction in Congressional and regulatory oversight served to simplify the "complexity and multiple character of the causal interconnections" for organizations previously subject to that oversight. However, it may have been that there were not adequate values "commonly held by all members in the field" to balance the reduction in regulation. Consequently, the reduction in oversight without a basis in commonly held values might have served to make the environment even more turbulent. Further, the decisions made to reduce regulatory oversight may have been informed as much by what Congress wanted to see as by the realities of the financial environment.

Salancik and Pfeffer (1977) in their classic article on power, address the issue of organizational adaptation to uncertainty stating that:

[T]he strategic contingencies theory of power paints and appealing picture of power. To the extent that power is determined by the critical uncertainties and problems facing the organization and, in turn, influences decisions in the organization, the organization is

aligned with the realities it faces. In short, power facilitates the organization's adaptation to its environment – or its problems. (p. 5)

Salancik & Pfeffer (1977) further insinuate that, depending on external contingencies, the portion of the organization best able to deal with the issues rises to power. However, on the national political scene, it may be that the group best able to deal with contingencies does not rise to power, but rather, the organization best able to create the perception of an ability to deal with issues that may or may not exist, rises to power. Consequently, the perception of the need for deregulation of banking was created not because there was a real need, but rather in support of a perception, the perception of the efficacy of the “invisible hand” of capitalism.

The Role of Biases

If leaders of smaller businesses have to exist in an environment largely beyond their control, how do they protect themselves from the unknown unknowns created by the larger economic and business environment? How do they determine if the realities are, indeed, realities and not created perceptions of reality? Much of the answer to this question may lie in continuous and rigorous self-questioning about assumptions and perceptions that they hold and about the nature of the environment in which they exist. There is a need to overcome perceptions in favor of evidence-based environmental analysis and a search for elusive unknown unknowns.

In 1984, James H. Barnes outlined the impact of cognitive biases on planning. Among the heuristics he outlined was “availability.” People tend to see an event as likely if it can be readily recalled or imagined. In the case of the current crises, few people have had actual experience with a depression. Therefore, they do not realistically perceive its possibility. There may have been a low probability of such an event happening as a result of any action that was taken. He also indicates that the misunderstanding of sampling can lead to problems “in forecasting the likelihood of uncertain events since one’s forecast must be based on a limited sample of past data” (p. 131). In searching for even more elusive unknown unknowns, the previous sample is practically non-existent. In looking at the confusion over correlation and causality, Barnes indicates that earlier research by Chapman and Chapman (1969) described an “illusionary correlation” created by one’s expectation of causality. Perhaps conversely, if leaders have had no experience with significant recession or depression, actual causal factors may not be perceived as such. If there has been no experience with the impact of deregulation on the markets, people might not expect that there would be any actual impact.

Barnes (1984) outlines earlier research that indicates that people are confident in judgments they make based on heuristics and that this can result in overconfidence. He asserts, “[T]here are reasons to believe that a person’s cognitive limitations will lead him or her to simplify the process of integrating information even when making the most important decisions” (p. 133).

To understand how biases may affect the ability of a leader to perceive reality associated with unknown unknowns for which no or little previous experience exists, leaders must understand potential biases and continually question whether or not they are allowing themselves to be subject to them.

Wikipedia (http://en.wikipedia.org/wiki/List_of_cognitive_biases) presents an entertaining overview of cognitive biases that could have an impact on the search for the realities of the existing and future environment. One of these particularly applicable to this paper would be the “bias blind spot” described as “the tendency not to compensate for one’s own cognitive biases.” The following biases from the Wikipedia article may offer insight on how they could have affected the current crisis.

The bandwagon effect is the tendency to believe or do things because others believe or do them. As business people, leaders may be members of professional organizations or industry groups which present an industry point of view that the leaders may perceive as appropriate simply because others in the group seem to believe in the ideas. This is closely related to “déformation professionnelle” which is the tendency to look at things through the eyes of one’s profession, discounting alternate points of view. Also closely related is the humorously named “Lake Wobegon Effect” based on Garrison Keillor’s imaginary town where, “all the women are strong, all the men are good-looking, and all the children are above average.”

The illusion of control causes people to believe they have more control over events and situations than they really do. Some deregulation was justified by the notion that the regulations had unduly restricted the behaviors of the so-called “sophisticated investors.” Sophisticated investors were assumed to know more than unsophisticated investors and, therefore, had a better understanding of risk.

The “not invented here” bias which is “the tendency to ignore that a product or solution already exists, because its source is seen as an ‘enemy’ or as ‘inferior.’” This may explain the calls for deregulation to support free market capitalism even though the regulations in place had prevented banking collapse for over 50 years.

Knowing about the possibility of the impact of natural biases in forecasting and decision making allows leaders to question their assumptions. Building the practice of critical self-evaluation of perceptual biases into the decision making process allows leaders to minimize their impact in both individual decision making and group planning activities.

Finding the Unknown Unknowns

Knowing that historical perspective, or its lack, current beliefs, and pseudo-knowledge based on inadequate historical sampling tend to color our perceptions of what to look for and what we see when we do look, we need to ensure our environmental scanning practices help protect us from biases as well as providing valid insights. In the face of biases, there may be a misperception of reality that allows us to ignore the unknown unknowns as they begin to emerge. Additionally, the biases of crowds or communities may form belief norms from which it is difficult for the individual to break.

Duncan (1972) conceptualized the environment as, “the totality of physical and social factors that are taken directly into consideration in the decision making behaviors of individuals in the organization” (p. 314).

These can be said to exist within layers and sectors (Daft, Sormunen & Parks, 1988), although other, more creative models may exist for given organizations in particular situations. The layers are identified as the task environment and the general environment. The task environment is that layer in which the day-to-day operations of the organization exist. The general environment has a more indirect impact on the organization. Sectors may be specific to the organization and may include such sectors as economic, customer, technology, socio-cultural, and government among others. In searching for unknown unknowns it may not be clear from which sector or which level new information may emerge. Indeed, unknown unknowns may not fit into the levels and sectors model at all. The search for these unknown unknowns may be viewed as akin to grounded theory wherein information and relationships may emerge from the study of environments with no theoretical basis provided for organizing or understanding the information.

Choo (2001) provides a more refined definition of scanning:

Environmental scanning is the acquisition and use of information about events, trends, and relationships in an organization’s external environment, the knowledge of which would assist management in planning the organization’s future course of action (Aguilar, 1967; Choo & Auster, 1993). Organizations scan the environment in order to understand the external forces of change so that they may develop effective responses which secure or improve their positions in the future. They scan in order to avoid surprises, identify threats and opportunities, gain competitive advantage, and improve long-term and short-term planning (Sutton, 1988). To the extent that an organization’s ability to adapt to its outside environment is dependent on knowing and interpreting the external changes that are taking place, environmental scanning constitutes a primary mode of organizational learning. (<http://informationr.net/ir/7-1/paper112.html>)

Choo (2001) uses Daft and Weick’s (1984) four modes of scanning including undirected viewing, conditioned viewing, enacting, and searching in his model. These vary along the dimensions of environmental analyzability and organizational intrusiveness. That is, the degree to which we can determine what is happening in the environment and the degree to which we actively intrude to collect information. If we assume that salient unknown unknowns exist within the environment, we would need to design a scanning strategy capable of discovering the most hidden aspects of the environment that could have an impact on the organization. These would most probably be elements that reside in that part of the environment which we consider to be unanalyzable.

Choo (2001) states that undirected viewing occurs when information needs are “ill-defined and fuzzy” and information is “non-routine or informal.” The environment is assumed to be unanalyzable and the degree of intrusiveness is low (passive receipt as opposed to an active search). Information needs in this mode are defined as “general areas of interest.” In the enacting mode the environment is still assumed to be un-analyzable but there is an active

intrusion (search) occurring. Information needs are described as “specific areas of exploration.” Conditioned viewing and searching modes tend to deal with more tangible and traditional aspects of environmental scanning (the search for “sensitized areas of concern” and “detailed search goals”). One form of Choo’s model focuses on scanning as information seeking and the other on scanning as organizational learning (Figure 2). Using this model in the context of unknown unknowns, it would seem that a mode somewhere between undirected viewing and enacting might be appropriate. It might be typified by a sense-making element between “waiting for important change” and “create features in the environment.” Environmental scanners would be creating an active learning search to anticipated changes.

		UNDIRECTED VIEWING		ENACTING	
Environmental Analyzability	Unanalyzable	Sense-making	Waiting for important change	Sense-making	Create features in the environment
		Knowledge Creation	Little pre-existing knowledge	Knowledge Creation	Tacit knowledge: learn by doing
		Decision Making	Coalition/Political mode	Decision Making	Anarchic/Process mode
		CONDITIONED VIEWING		SEARCHING	
	Analyzable	Sense-making	Driven by norms and beliefs	Sense-making	Determine objective reality
		Knowledge Creation	Cultural knowledge: expectations, frames	Knowledge Creation	Explicit knowledge: hard data, formal models
Decision Making		Programmed/Rational Mode	Decision Making	Process Mode	
		Passive		Active	

Figure 2: Choo (2001) Environmental scanning as organizational learning

This concept is substantiated by Mesch’s (1984) description of the potential contributions that can be made by a well-developed environmental scanning system. He states that such a system can make the following contributions:

- Create a proactive planning system which will attempt to anticipate changes rather than react to them.
- Look at a wide range of emerging situations, their interrelationships, and their impact on the company.
- Provide a focal point on which to coordinate and facilitate the environmental scanning effort.
- Heighten management’s overall awareness of events in the external environment and thus sensitize them to look for opportunities in these changing surroundings. (p. 148)

In Choo’s (2001) model, conditioned viewing and searching are activities which involve things we already know we want to ask about. In the search for unknown unknowns we are often not sure what questions we should be asking, about which elements that may or may not exist. The environment would appear to be unanalyzable. In that unknown unknowns will probably

emerge, almost by definition, from this type of environment, there would be a premium on making the unanalyzable, analyzable. We accomplish this by focusing an active rather than passive search on the unanalyzable portion of the environment.

Scanning, Searching, and Moving

A basic underpinning of organizational success is the ability to maintain a sustainable competitive advantage. Porter (1979), in addressing competitive forces, states:

The essence of strategy formulation is coping with competition.... Moreover, in the fight for market share, competition is not manifested only in the other players. Rather, competition in an industry is rooted in its underlying economics, and competitive forces exist that go well beyond the established combatants in a particular industry. Customers, suppliers, potential entrants, and substitute products are all competitors that may be more or less prominent or active depending on the industry....

Whatever their collective strength, the corporate strategist's goal is to find a position in the industry where his or her company can best defend itself against those forces or can influence them in its favor. The collective strength of the forces may be painfully apparent to all the antagonists; but to cope with them, the strategist must delve below the surface and analyze the sources of each. (p. 137)

Sources of sustainable competitive advantage, therefore, may exist in the larger environment outside the strict boundaries of a company and its competitors. They may also exist in the general environment; undiscovered and unexploited. If they do exist in the general environment and they are of value and others do not possess them, then finding them before other organizations would be a beneficial activity in terms of securing that which will result in an advantage.

Reflecting on the Johari Window (Luft & Ingram, 1955) and Choo's model (2001) we posit that the following model (Figure 3) illustrates the need for an environmental scanning effort focused on exactly that part of the environment which may be most "unknowable" because that is where factors that can create the greatest competitive advantage may be located. Additionally, it presents a dynamic process whereby discovered factors can be moved, either directly or indirectly, toward Quadrant 3 (Unknown to Others and Known to Own Organization) wherein competitive advantage can be realized and sustained.

Scanning information can be seen as a source of competitive advantage if it is properly managed and exploited. Barney (1995) outlines four questions that must be addressed about resources and capabilities. Applying those questions to the information resource created by environmental scanning would lead to the following:

- Do the information resources and knowledge created by a comprehensive environmental scanning process add value that will allow the organization to exploit opportunities or neutralize threats? The organization must be able to generate enough scanning

information so that it has an ample supply of ideas in a “discovery incubator” where ideas can be evaluated in terms of their potential for creating competitive advantage.

Additionally, it must design its processes such that it searches in those areas most likely to produce information that best meets the last three questions.

- Is the scanning information or knowledge rare? The rarer (less pervasively known) the information or knowledge, the more likely it will be to contribute to competitive advantage. To find the rarest information and knowledge may mean doing things very differently than they were done in the past. Also, they may need to be very different things than other competitors are doing to search and analyze the environment. The novelty of the search process in conjunction with searches in unknown territory will produce the greatest likelihood of finding that which is most rare.
- Is the process or outcome associated with the scanning information or knowledge able to be easily imitated? The more it can be imitated, the less value information has as a competitive resource. This means that the organization may need to search for information that it can use uniquely. The information sought may need to be aligned with the organization’s unique skills, abilities, knowledge, and already existing resources or their unique ability to develop those skills, abilities, knowledge, and resources.
- Is the firm organized to both obtain and make use of the scanning information or knowledge? Barney (1995) refers to organization of the firm as “complimentary resources.” To exploit the scanning information and knowledge, the organization must either have in-place structures (relationships, policies, rules, control systems) or be willing to develop them.

Figure 3 presents our model as similar to the Johari Window (Luft & Ingram, 1955) but focused on the leader’s own organization and other organizations rather than self and other individuals. Each quadrant is described by its degree of competitive advantage, what scanning would be focused on, and the quadrant’s developmental relationship to the other quadrants. It is prescriptive in the sense that, in terms of knowledge obtained during environmental scanning, it tends to direct the organization toward the “unknown to others and known to own organization” quadrant because Quadrant 3 offers the most opportunity for developing competitive advantage.

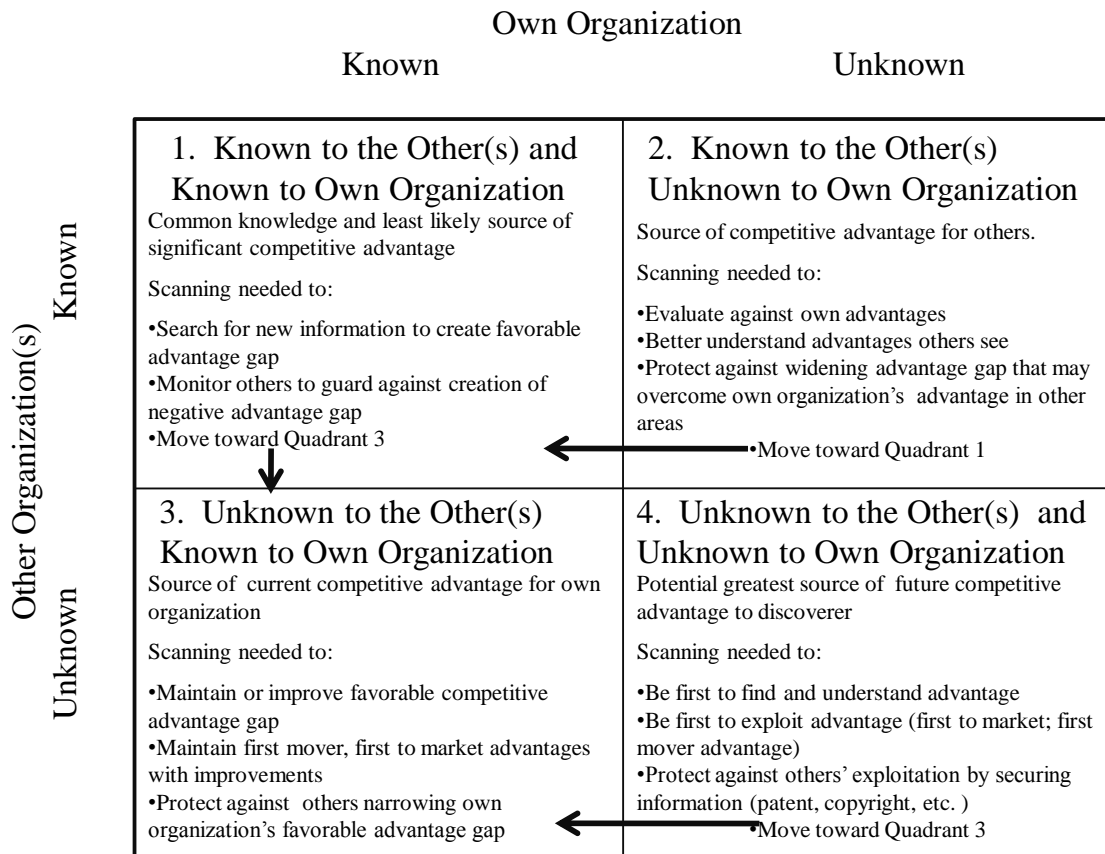


Figure 3. Converting Unknown Unknowns to Sustainable Competitive Advantage

Quadrant 1, where information is known to your own organization and known to others, provides the lowest likelihood of emergent competitive advantage. Competitors are just as likely as your own organization to discover new knowledge in the normal course of operations. Competitive advantage can be gained by searching in areas that are unexplored by others or for which new types of searches can be constructed. In this case, the organization can move into Quadrant 3. The question would be whether or not the advantage can be sustained given its incremental nature and the relative ease with which such movement can be followed.

Quadrant 2 represents the area in which information that could produce a competitive advantage is held by others but not by your organization. In this case the other organizations hold a competitive advantage and your organization is in a “catch up” position. Your organization is focused on finding out what they do not know so they can gain competitive parity and move into Quadrant 1. Depending on the magnitude of any discovery, it is conceivable that the organization could move from Quadrant 2 into Quadrant 3 but it would seem more likely that movement would be from Quadrant 2 into Quadrant 1 and then on to Quadrant 3 at some point.

The least that an organization would be aiming for would be protecting against any widening of the current competitive gap in which they are at a disadvantage.

Quadrant 4 represents the situation in which potentially important information may exist but to which nobody currently has access. Because your own and other organizations are at a disadvantage parity, the first to discover new information might gain a first-mover advantage which they could use both to exploit the new knowledge and preclude the other organizations from gaining it through copyrights, patents, and other such devices and activities. Having the new information immediately puts the organization into Quadrant 3. The importance of the potential competitive advantage will be based on activities after discovery to actually use the information and prevent others from gaining access and using the information.

Mesch (1984) presents a set of questions that he encourages the reader to ask about environmental assessment factors. They include such issues as: 1) external factors affecting operations; 2) factors that may be threats; 3) factors about the competitors' future; 4) the company's strategic direction and associated factors; and 5) external areas likely to show change that would favorably affect the company's future. If an organization already has a scanning process that addresses things that are known about the external environment, it would need to focus on the unanalyzable portion of the environment to begin to find the unknown unknowns. Mesch's questions tend to be somewhat non-specific and open-ended. The openendedness of the questions tend to allow for more creative thinking. Consequently, the questions we ask to uncover the dynamics and elements of the unknown unknowns environment should focus on things we do not normally think about or explore. Organizational leaders might want to ask:

What is your perceived environmental structure in terms of sectors and levels? Why are these perceptions wrong? Do sectors and levels make sense for your organization? What are you missing? What alternate structure can you conceive that has more meaning to you? How might you restate and define your environment?

- What perceptual and decision biases does your team possess as individuals? Why do you believe these things? What are the specific events, processes, and outcomes in your past that have led you to believe the things you believe? Why could these perceptions be wrong? What process would you use to avoid them in your decision processes?
- Who do you perceive to be the current relevant actors in your environment? Who receives or could receive the benefit of your product or service? Who do you think absolutely would not be such recipients? What is it about them and your beliefs about them that make you think they would not benefit? What would have to change? Aside from customers, who are the other actors and why should you perceive them differently than you currently do?
- Who are the contrarians telling you what we do not want to hear about your environment, industry, or company? What are they telling you? Why are you choosing to ignore their voices? Is it because they are telling you about something that we do not want to see coming? What is the danger in ignoring them?
- Who are the voices within your own organization which you are not hearing? Why are you not listening to them? Are they too young or inexperienced? Are they not of a high

enough status or position? Are they not in the “right” functional track? Are they too old with ideas that just do not apply anymore?

- Where do you look for change? What are the five most interesting, bleeding-edge ideas or technologies in your industry? How fast are they evolving? In what timeframe will they begin to impact our organization? Divide that number by two. Which competitor will already be there when you arrive?
- What are the ten most interesting, bleeding-edge ideas or technologies that you have seen in the last two years regardless of industry? Relate all the ideas about why those ideas or technologies do not apply to you? Why is each of them potentially completely wrong?
- How do you monitor shape, range, structure, flow, change, direction, time, speed, and complexity within your environment? How do you build that information into your decisions?

Conclusions

Recent economic crises and claims that, “We never saw it coming” are more a statement of possible inattentiveness to natural perceptual and decision biases than they are to a lack of information available in the environment. This, combined with environmental scanning processes that do not search for unknown unknowns, results in a refusal to see what is available to be seen. In turn, decisions are made based on a less than optimal awareness of environmental factors which should affect the decisions. Finally, the unwillingness or inability to perform comprehensive searches for unknown unknowns may result in a strategy that does not seek to gain significant competitive advantage, but rather is accepting of the status quo in a dynamic environment.

When we think of early explorers setting out on the sea with little knowledge of what they might encounter, we find an apt metaphor for the activities associated with environmental scanning. We may picture ourselves in the crow’s nest scanning the horizon. For what, we are not sure. And before we see land, we may smell the earth, hear the call of a distinctive shore bird, see the color of the water change, or see clouds building, possibly over an island, where no island is expected.

“Land, ho!” cries the lookout and the cry is repeated across the deck to the mate and then to the captain. And the captain calls back, “Where away?” seeking more information from the one who sees. And the ship’s course is decided on the word of the one who sees clearest and best, but more importantly, the one who sees first, regardless of rank or position.

The new land is found where before the chart said only, “Here there be monsters” or “*Terra Incognita*.” The rewards of discovery come to those who look best, find first, and do not fear the monsters. They come to those who know that the *terra incognita* is only land unknown, not land unknowable.

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An earlier version of this paper was presented at an internal faculty/student conference at Argosy University – Sarasota Campus in April 2009. We would like to thank the faculty and students for their suggestions and comments.