When giants collide: strategic analysis and application

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Abstract
On June 4, 1942, a small US naval force defeated a much bigger Japanese fleet off Midway Island. This was the first defeat suffered by the heretofore invincible Japanese military, and changed the course of the Pacific war. The Battle of Midway provides an informative case study of strategic decision-making processes, because of its unexpected outcome and volatile environmental factors. Building from Daft and Weick's (1984) ''interpretation system'' model, this paper develops an analytical framework to study the formulation of strategic decisions at the Battle of Midway. The three interacting components of the framework – decision parameters, decision processes, and decisions and implementation – are examined, with emphasis on how bounded rationality, cognitive biases, leadership styles, management structures, and organizational cultures combine to impact strategy formulation. Research and strategic implications are highlighted.

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Introduction

There are perhaps as many approaches to strategy research as there are researchers. In this paper, we take the perspective that organizations are social systems made up of people, their aspirations, frustrations, egos, and so on. Barney (1992) suggests that ''organizational behavior concepts and research should be at the core of strategy formulation research, as well as strategy implementation research'' (p. 41). Nevertheless, as Bourgeois (1984) has pointed out, much of management literature downplays the role played by the human agent and fails to recognize that it is individuals who make strategic decisions. The view of organizations as unitary, rational decision-makers, however, has its limitations, chief among which is a disregard for organizational and political processes that impact decision outcomes. Allison's (1971) analysis of the Cuban missile crisis is a case in point.

Humanizing the strategic decision-making process, however, is not without its problems. Some two decades ago, Tversky and Kahneman (1974) discussed how people use ''heuristics'' to reduce the complexities of decision-making. Moreover, the concept of bounded rationality (e.g. Simon, 1976) recognizes that humans have limited cognitive ability, and casts doubt on the notion of the ''rational'' decision-maker who considers all the available alternatives, weighs their advantages and disadvantages, and makes a decision after a comprehensive examination of every piece of information.

Acknowledging organizations as social systems adds another dimension to the process of strategic decision-making: how members of this social system view and interpret the world around them largely determines what decisions will be made and how they may be implemented. A system of shared meanings, or culture, guides the way individuals view and interpret the world (Martin, 1979). In an organizational setting, it is important to study how culture is created and sustained. We will examine a detailed case example of strategic decision making, from the points of view of both competitors, and relate the respective success and failure to the decisions that were taken, how they were made, and what other factors may have affected the outcomes.

The Battle of Midway (June 1942) offers a particularly interesting case study. The outcome of the battle seems to defy conventional wisdom. Against overwhelming odds, the American fleet defeated a much larger and more experienced Japanese fleet in what became known as ''the battle that doomed Japan'' in the Second World War (Fuchida and Okumiya, 1955). The case is even more relevant today, as the two parties are once again at war; only the weapons have changed. Through American and Japanese historical records, we attempt to analyze the human element in the competing parties' decision processes. We are able to see, for example, how cognitive biases (e.g. Schwenk, 1984) and interpretations (e.g. Daft and Weick, 1984) impacted the strategies that emerged. Moreover, by comparing and contrasting these strategies and studying how they came about, we are able to build a framework to facilitate the analysis of strategic decisions. Moreover, Japanese and American interpretations of the Battle of Midway seem to agree on most of the important events and decisions, hence reducing nationalistic biases that may affect historical analyses. A further attempt to triangulate is made by examining the biographies of the two CEOs – Admiral Isoroku Yamamoto of the Japanese Navy (Hoyt, 1990), and Admiral Chester W. Nimitz of the US Navy (Potter, 1976). In addition to providing perspectives on strategic decision-making at Midway, these biographies also shed light on the leadership qualities and management styles that the two admirals exhibited, and how these may have impacted the outcome of the battle.

The objective of this paper is three-fold. First, as Chaffee (1985) suggests, strategy is multidimensional as well as situational. The present paper seeks to demonstrate that this is indeed the case. This is accomplished by taking into account the role played by leadership, resources, organization structure, and environmental variables, among others. We present an analytical framework to help study the formulation of strategic decisions, supported by an actual case study. Second, by examining a case in which the outcomes are, at least on the surface, surprising and seem to go against conventional wisdom, we may re-evaluate some of the basic assumptions underlying much of the literature on strategic management. And third, this paper's contribution will be measured by whether it generates insights that resonate with the reader, and consequently adds to the general body of knowledge of strategy.

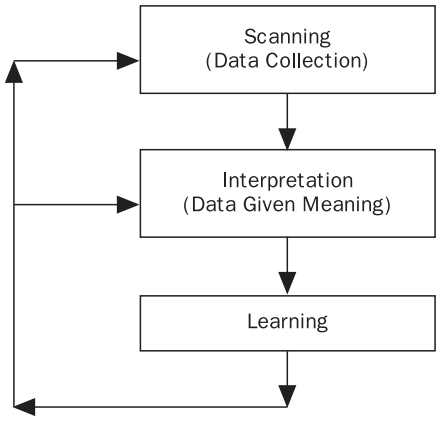
We will first develop a conceptual framework which depicts how various factors contribute to strategic actions. Then we provide some historical background about the Battle of Midway, which becomes the basis of our strategic analysis to follow. The article ends with a summary of our findings, and highlights research and managerial implications for future consideration.

Conceptualization

Daft and Weick (1984), viewing organizations as ''interpretation systems,'' propose a three-stage learning process whereby scanning, interpretation, and learning are interconnected by a feedback loop. Scanning is the process of data collection, be it formal or informal. Interpretation is where data are given meaning. Learning involves action based on the interpretation, and occurs when knowledge is gained from the action outcomes. Although Daft and Weick discuss these three stages in sequence, they emphasize the interconnectedness of the three stages, and their model is more appropriately seen as a circular process. Daft and Weick's model is depicted below in Figure 1.

As we can see, an organization gathers information on the environment by way of scanning. This information, however, is meaningless in and of itself. It is through a process of interpretation that organization members give meaning to the data. Having arrived at a system of shared meanings and conceptual schemes, strategic decisions are made and actions taken. And the outcome of this action contributes to organizational learning. But the process is not unidirectional. Indeed, knowledge gained from the

Figure 1
Three-stage process of organizational learning



Source: Daft and Weick (1984, p.286)

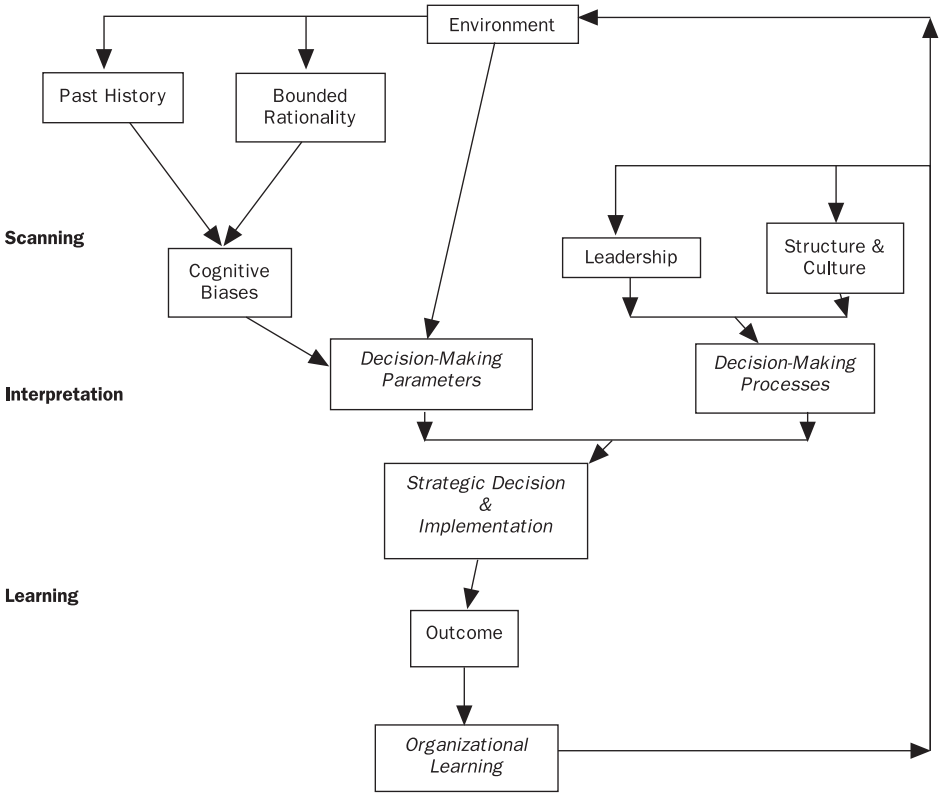
learning cycles back to the scanning and interpretation phases, in turn affecting how future decisions are made. In other words, learning impacts the way individuals make sense of their world. As Peter (1992) argues, the subjectivity of humanity shapes our development of knowledge.

Analytical framework

We can borrow from Daft and Weick's framework to help us analyze the Battle of Midway. To do so, we shall use their interpretation framework as a base and build upon it. This hybrid framework is shown as Figure 2.

From the model, we posit that there are three key components that interact in a decision process. First, decision making parameters consist of cognitive biases which are constrained by past events and limited cognitive abilities. This results in selective filtering during data collection. Second, decision making processes shape how information is interpreted, and this is affected by leadership style, organizational culture, and structural considerations. The parameters and processes converge on the next component, that of decision and implementation. Here, the organization's strategy interacts with the environment, resulting in a set of outcomes on which organizational learning is premised. The knowledge gained from this learning process feeds back into the various elements, thereby affecting future scanning and interpretation activities. The components of the model are not new, but in the past they were usually studied in isolation. The proposed framework's contribution lies in its portrayal of strategic decisions as a complex web of interacting elements, which allows a more holistic view of the subject matter.

Figure 2
Extension of Daft and Weick's framework



We shall next proceed to analyze each of the key elements of this framework, using the Battle of Midway as an actual case study. We begin with a discussion on the parameters which are affected by bounded rationality and cognitive biases. Next we examine the processes of decision-making, which are informed by leadership characteristics, structure, and culture. And lastly, we look at decisions and implementation, the stage where parameters and process join forces to produce decisions and direct their implementation. Before we do so, a summary of the Battle of Midway would be in order.

The Battle of Midway: a historical account

> By any ordinary standard, they were hopelessly outclassed ... They knew little of war. None of the Navy pilots on one of their carriers had ever been in combat. Nor had any of the Army fliers ... Their enemy was brilliant, experienced and all-conquering ... They had no right to win. Yet they did, and in doing so they changed the course of a war (Lord, 1967, pp. ix-x).

On June 4, 1942, a small US fleet, comprising what remained of the Pacific Fleet after Pearl Harbor only six months before, engaged the powerful Japanese navy near Midway Island. At the cost of one aircraft carrier and one destroyer, the US fleet sank four enemy carriers as well as a heavy cruiser. More important, the Japanese lost some 300 planes and most of their experienced pilots. After Midway, the Japanese Navy dropped their plans to invade Australia and Southeast Asia and instead remained on the defensive for the balance of the war.

Background

At Pearl Harbor, Japan failed to destroy the US aircraft carriers which were the main target. Despite the heavy damage suffered by the US Pacific Fleet, its intact carrier force remained a constant threat to Japanese domination in Asia. Admiral Isoroku Yamamoto, architect of the Pearl Harbor raid, was concerned that failure to achieve total destruction of the US fleet was akin to waking up a sleeping giant (Hoyt, 1990). Partly because Yamamoto had previously been posted to the US as military attaché, he was impressed by America's industrial capabilities and became convinced that a prolonged conflict would be to Japan's disadvantage. The key, therefore, was to secure a quick and conclusive victory without giving the Americans a chance to bring their strength and

resources to bear (Morison, 1967). But how could the US fleet be enticed to assemble at one place to be destroyed? How could Yamamoto use his superior firepower in a decisive engagement and annihilate America's naval presence in the Pacific? And how could this be accomplished while Japan still had the advantage, before the US could shift part of its Atlantic Fleet through the Panama Canal into the Pacific theater, and before new ships could be completed?

Yamamoto believed that "the only way to draw Nimitz [his American counterpart] out so that the [US] fleet could be wiped out was if Japan threaten something that America valued" (Morison, 1967, p. 75). To do this, he proposed to attack and occupy Midway, a tiny atoll 1,135 miles from Pearl Harbor. Midway was significant because of its location as the westernmost of the Hawaiian chain. Thus situated halfway across the Pacific, the atoll was like an unsinkable aircraft carrier and acted as a "sentry to Hawaii" (Simkins, 1976). By threatening Midway, Japan would force the US fleet to converge on the atoll. The much stronger Japanese Navy could then "complete the work of December 7 [1941, Pearl Harbor]" (Potter and Nimitz, 1960, p. 669).

Yamamoto's plan comprised three separate but interrelated phases:

1 a diversionary attack to occupy the Aleutians, more than 1,500 miles from Midway;
2 invasion and occupation of Midway; and
3 fleet engagement to destroy the US Pacific Fleet (Morison, 1967).

The element of surprise

The Japanese plan was premised on achieving surprise, that America would not react until after Midway had been secured, by which time the atoll would be a deathtrap for the approaching US fleet (Fuchida and Okumiya, 1955). Furthermore, the diversionary attack on the Aleutians, for which Japan dispatched two of its carriers, was designed to confuse the American command (Potter and Nimitz, 1960), and to act as bait (Simkins, 1976). In the words of historian Morison (1967, p.78):

> The Combined Fleet [Japan] was deployed in accordance with Japanese strategic habits. They overvalued surprise, which had worked so well at the beginning, and always assumed they could get it. They loved diversionary tactics – forces popping up at odd places to confuse the enemy and pull him off base .... Yamamoto, counting on surprise, expected no opposition to his invasion of Midway.

Only this time it was Japan's turn to be surprised. Unknown to the Japanese, the US Navy was beginning to break some of the Japanese radio codes. By mid-May, Admiral Nimitz authorized the development of plans to defend Midway and turn back a diversionary attack on the Aleutians (Potter, 1976). He ordered every available ship to be redeployed to Midway. But even with this advance warning, the Pacific Fleet could match neither the enemy's firepower nor his experience (Lord, 1967). Except for submarines, the Japanese fleet outnumbered the Americans in every ship category (Smith, 1966).

The surprise that Yamamoto counted on was lost. As Potter and Nimitz (1960, p. 671) pointed out: "the Japanese made the mistake of planning a major operation so that it depended on surprise when there was no necessity for their doing so". Members of the Japanese command indicated afterwards that there was no provision for the contingency that the Americans might discover what Yamamoto was up to ahead of time, and would be in a position to "deploy his forces for an ambush" (Fuchida and Okumiya, 1955, p. 134).

Command structures

The Combined Fleet – Japan

Admiral Isoroku Yamamoto was Commander in Chief Combined Fleet. Following the success at Pearl Harbor, Yamamoto had become a national hero and was arguably the most influential leader in the Japanese navy (Hoyt, 1990). Like Pearl Harbor, the Midway invasion was his brainchild. The battle plan was drawn up by Yamamoto and his staff at Combined Fleet Headquarters with no consultation from field commanders. Even the alternate commander of the Fleet did not learn of the plan until after it had been set (Kondo 1955). And despite recommendations by his fleet commanders to postpone the invasion so as to allow more time for preparation, "Combined Fleet was not in the mood to accept even minor changes" (Fuchida and Okumiya, 1955, p. 94). According to Morison's (1967) account, we may surmise that Yamamoto was particularly anxious to destroy the US fleet before reinforcements could arrive from the Atlantic, and before the US could bring its much larger industrial base into the equation. Yamamoto was convinced that he only had a two-month window of opportunity.

For the operation, Japan mustered some 160 naval vessels, including ten aircraft carriers, 11 battleships, and a multitude of other combat ships (Smith, 1966). These were divided into various operational units, chief among which were the Carrier Striking Force under Vice Admiral Nagumo, the Midway Occupation Force under Vice Admiral Kondo (who was also alternate commander of the entire operation), and the Main Body under Yamamoto himself (Potter

and Nimitz, 1960). Essentially, Nagumo's carriers were to assist Kondo in invading and occupying Midway, and to engage any American ships that might come to the rescue. And finally, Yamamoto himself, in his flagship *Yamato* (the largest battleship ever built), would destroy the US fleet in a grand surface engagement (Morison, 1967).

We can envision Yamamoto, Kondo, and Nagumo as the top management team on the Japanese side. Because Kondo's task was to invade and occupy Midway, he did not figure in the carrier battles that epitomized the Battle of Midway. For our purposes, then, the key players for Japan were Nagumo who managed the Japanese Navy's critical resources – the fast carriers, and Yamamoto, 300 miles away, who had overall command.

Yamamoto's battle plans were rigid and his fleet commanders were not consulted. Although Nagumo by all counts managed one of the most important units, he was not informed of any new developments after the fleet set sail for Midway. As the fleet approached Midway and search planes and submarines failed to locate the American carriers anywhere, Yamamoto had become increasingly concerned. Yet, due to poor communications, Nagumo was not aware that the Americans had not been located. In the interest of maintaining radio silence, Yamamoto did not relay the information to Nagumo (Simkins, 1976). Nagumo thus operated under the false assumption that the US carriers were still at Pearl Harbor as the Midway operation got underway.

The Pacific Fleet – United States

Along with Eisenhower and MacArthur, Admiral Chester W. Nimitz was one of the three US theater commanders during the second World War. His area of responsibility was the ''Pacific Ocean Area,'' essentially splitting between himself and MacArthur the Pacific theater (Potter, 1976). Assuming his command after the Japanese attack on Pearl Harbor, Nimitz took charge of a Pacific Fleet that was a shadow of its former self. But his aircraft carriers were intact, and by early 1942 they began a series of hit-and-run operations which increasingly bothered the Japanese (Simkins, 1976).

As noted earlier, Nimitz obtained advance warning that the Japanese were about to attack Midway. In fact, Nimitz's information included such vital information as the enemy's approximate composition, direction of approach, and the approximate date of attack. But given the meager resources at his disposal, the advance warning was ''very much like foreknowledge of an inevitable disaster'' (Potter and Nimitz, 1960, p. 672).

Against the larger Japanese fleet, Nimitz could assemble only three carriers and their escorts, about 60 ships in all, and not one battleship among them (Smith, 1966). Nimitz had in mind for Admiral Halsey to have operational command of the engagement. However, Halsey was lost to him because of a severe case of dermatitis which, coupled with six straight months of combat duty at sea, forced Halsey to be hospitalized. Having lost his most aggressive and experienced carrier admiral, Nimitz placed his three carriers under the overall command of Admiral Fletcher. Fletcher himself commanded the Yorktown, while Admiral Spruance commanded the other two carriers of the fleet (Potter, 1976).

In contrast with Yamamoto, Nimitz did not normally make rigid plans. In fact, his biography shows a leader who fully utilized a participatory decision-making style (Potter, 1976). In the case of Midway, his orders to Fletcher and Spruance were anything but rigid (Morison, 1967, p. 84):

> In carrying out the task assigned ... you will be governed by the principle of calculated risk, which you shall interpret to mean the avoidance of exposure of your force to attack by superior enemy forces without good prospect to inflicting, as a result of such exposure, greater damage on the enemy.

Unlike Nagumo, the American commanders on the scene had much more flexibility to act. And also unlike Nagumo, they knew exactly where the enemy was.

Conflict at sea

Nagumo had more than 200 planes in his Carrier Striking Force. In the early morning of June 4, 1942, he sent half of them to bombard Midway, while the balance he kept on the flight decks of his carriers. These ''reserve'' aircraft were armed with torpedoes and armor-piercing bombs, to engage American warships if and when they appeared. He also launched seven search planes to provide early warning of any approaching US vessels (Potter and Nimitz, 1960).

Two hours after his planes left for Midway, his strike commander reported that a second wave was required before destruction of Midway would be complete. Ten minutes later, aircraft from Midway attacked Nagumo's carriers. Though the Americans were easily repelled, their attack confirmed that another bombardment of Midway was necessary. And so Nagumo ordered his reserve aircraft to be unarmed (i.e. torpedoes removed) and rearmed with bombs[1] for a second attack on the island (Simkins, 1976). While this was happening, Nagumo received a report from one of the search planes that US carriers were

sighted. But by now he was incapable of doing anything about it, because his planes were in varying stages of being unarmed and re-armed, and his first wave of aircraft was about to return and would require clear flight decks for landing. Although he now knew he would have to deal with at least one American carrier, Nagumo was forced to be on the "receiving end of a carrier battle," and not the giving end as Yamamoto had planned (Morison, 1967, p. 108).

It is significant to note that the search planes that Nagumo sent to look for American ships each had a different sector of responsibility. One of these search planes was half an hour late taking off, and it was this particular plane's sector where the American carrier forces were positioned (Willmott, 1983). Had Nagumo learned of the Americans' whereabouts half an hour sooner, he might have been able to send at least some of his reserve aircraft to attack the US fleet. This delay is seen by many historians as one of the critical factors contributing to the Japanese defeat at Midway (Potter and Nimitz, 1960).

US aircraft from the three carriers hit Nagumo just after he had finished recovering his first wave planes. Admiral Spruance, in charge of two of the carriers, decided to go all out. He noted later:

> ... I am more than ever impressed with the part that good or bad fortune sometimes plays ... All that I can claim credit for, myself, is a very keen sense of the urgent need ... to hit the enemy carriers with our full strength as early as we could reach them (Spruance, 1955, p. v).

Spruance not only launched every aircraft he had, he also did it two hours ahead of schedule in the hope of catching Nagumo in the act of refueling planes on deck. The danger was that the American planes would have a greater distance to cover, and there was concern that some might not make it back. But Spruance considered that a "commensurate risk" worth taking (Morison, 1967, p. 113), and as it turned out, he was right.

But the American attack was far from coordinated. Indeed, "whatever coordination was achieved in the ensuing attack was entirely accidental" (Potter and Nimitz, 1960, p. 678). It was much easier pointing at a map than to look for moving ships. And by the time the planes arrived at the approximate location of Nagumo's fleet, most of the aircraft were scattered and fighter escorts had somehow disappeared. The attack, when it came, began on a lacklustre note. Out of 41 torpedo planes, only six returned, and not a single torpedo reached the enemy ships. Thus, not one hit was recorded by these planes, 35 of which were shot down. Yet, because the Japanese carriers had to maneuver radically in reaction to the attack, they were unable to launch their own aircraft[2]. The attack by the torpedo bombers made another contribution. Japanese fighter aircraft that were covering the carriers, thinking that the low-flying torpedo bombers were the only threat, swarmed down from their high altitude patrol. And while they managed to inflict heavy damage on the torpedo bombers, they had relinquished control of the high altitude airspace. As a result, US dive bombers that arrived a few minutes later encountered no Japanese fighters, and were able to attack virtually unopposed, and to drop bombs on full deckloads in the process of being refueled (Morison, 1967).

By the end of the day, all four carriers under Nagumo were sunk. For the Americans, Yorktown was lost. Yamamoto still had superior firepower even with Nagumo's losses, and he could have brought his forces to bear. But Yamamoto was unaware of Nagumo's problems or the extent of the damage. He was planning a counter-attack when news arrived that three of Nagumo's carriers had been sunk (the fourth one at that time was still afloat). He attributed Nagumo's losses to poor morale, and upon hearing that Nagumo was retreating, promptly relieved the latter of command (Lord, 1967, p. 251). Yamamoto dispatched part of his surface fleet to support the carriers, but these arrived too late. His other carriers were too dispersed to be of consequence. He decided to recall his ships and not risk another air attack by the Americans. And in doing so, Yamamoto canceled the Midway operation (Potter, 1976).

The outcome of Midway was more than a physical victory for the Americans. For despite the loss of ships, planes, and manpower, Yamamoto retained a superior force. Yet Midway marked a symbolic end to the streak of Japanese victories, and this, more than anything else, boosted American morale. Admiral Nimitz, in a communiqué after the battle, said (Potter, 1976, p. 107):

> Pearl Harbor has now been partially avenged. Vengeance will not be complete until Japanese sea power is reduced to impotence. We have made substantial progress in that direction. Perhaps we will be forgiven if we claim that we are about midway [pun intended] to that objective.

Strategic analysis

In this section, we shall examine how various factors affected the eventual outcome of the battle. The Battle of Midway can be analyzed using the framework that was developed earlier (Figure 2). Using the framework as a

base, we begin by studying each of its components, namely, parameters, processes, and decision and implementation.

Decision parameters: cognitive biases

Bounded rationality

Simon's (1976) notion of bounded rationality is a common premise for the study of the behavioral aspects of organizations (e.g. Drummond, 1992; Luthans, 1989; Schermerhorn *et al.*, 1982). In essence, humans are limited in their cognitive abilities, and this constraint often prevents people from making decisions in a systematic, comprehensive manner. As Drummond (1992, p. 2) puts it: ''Choice is based upon intelligent guess work, the aim being to find something that 'will do'''. Because of this, decisions are heavily influenced by one's motivations, abilities, and opportunities to process relevant information from the environment. This has, for example, formed much of the basis of the study of consumer behavior in marketing (e.g. Celsi and Olson, 1988).

Intelligence and communications

Although the importance of intelligence is often left unstated in management literature, information, or intelligence, can be an important source of competitive advantage (Drucker, 1985; Ghoshal and Bartlett, 1990). In the traditional rational approach to decision-making, for instance, complete information availability is an implicit assumption, though it is not clear how such total information may come about. Lately, researchers have begun to see market intelligence as central to the concept of market orientation (Kohli and Jaworski, 1990; Narver and Slater, 1990). The gathering, dissemination, and responsiveness to market intelligence is seen as what market orientation is all about. Yet, bounded rationality imposes severe limits on our ability to collect and decipher information.

Environmental scanning

This is one of the ways management gathers and generates information on external events and trends (Daft *et al.*, 1988; D'Aveni and MacMillan, 1990). Weitzel and Jonsson (1989) point to both internal and external monitoring as means of avoiding organizational decline. But for environmental scanning to take place, management needs to perceive a ''strategic uncertainty''. This necessitates an uncertainty to be seen as important (Daft *et al.*, 1988). At Midway, Nagumo was uncertain as to the whereabouts of the US carriers, but he did not consider that important enough to seriously scan the environment. Perhaps this is attributable to cognitive biases which led to an illusion of invincibility. As we have noted, his half-hearted effort to search for the enemy was a major cause of his defeat. As Daft *et al.*, (1988) demonstrate, executives in high-performing firms tend to scan their environments more frequently, and to do so broadly. Obviously, Nagumo did not.

Drucker (1985) notes the importance of intelligence when he suggests that being ''Fustest with the Mostest'' may not always be the best strategy. He suggests that ''entrepreneurial judo'' and ''creative imitation'' are two strategies that have good chances of success, and notes that Japanese firms have been utilizing these approaches to their advantage. But to successfully implement these strategies, good intelligence is required. Schwenk (1986) provides a discussion on how information may be used to engender commitment to a course of action. He suggests that vivid anecdotal information may be useful in influencing a decision maker's level of confidence in a course of action. From the Battle of Midway, we can clearly see the critical role that the gathering and communication of market intelligence plays. Yamamoto indeed tried to be ''Fustest with the Mostest,'' by sending a large fleet to capture a six-square mile atoll. Yet he did not do a thorough job scanning his environment, and what little information he had gathered he did not see fit to pass on to Nagumo. And because of superior intelligence, Nimitz was able to outmaneuver Yamamoto.

At Midway, Nagumo had a pivotal role to play because he controlled the primary assets of the Japanese fleet – its four big carriers. Yet his flagship did not have up-to-date communications gear. As a result, the best available information was kept 300 miles to the rear, while Nagumo was only fed whatever data Yamamoto's staff chose to send him (Hoyt, 1990).

Contrast this to what happened at the American end. Spruance and Fletcher, the commanders on the scene, had the most current information. It was a Nimitz trademark that he believed his field commanders should always have the best information and that those in headquarters should do their best not to interfere[3]. Thus, the overall commander, Nimitz, relied on Spruance and Fletcher to provide situation reports. In fact, because Spruance and Fletcher maintained radio silence during much of the battle, Nimitz and his staff obtained most of their information by intercepting those Japanese radio messages that were broadcast in the open (Potter, 1976).

The Battle of Midway was in many ways won by the Americans because of superior information. As Fuchida and Okumiya (1955, p. 232) point out:

> It was a victory of American intelligence in a much broader sense than just this [breaking the Japanese code]. Equally as important as the positive achievements of the enemy's intelligence ... bad and ineffective functioning of Japanese intelligence.

Past history

Tversky and Kahneman (1974) suggest that people rely on certain heuristics, rather than a machine-like analytical process, to make judgements under uncertainty. We shall highlight some of the more salient cognitive biases that influenced decision-making at Midway.

Problem set

On paper, the Japanese Navy was destined to succeed at Midway. Even with advance warning, Nimitz's resources were minuscule compared with what he was up against. However, historians suggest that even though Yamamoto had superior force, he had spread them over such a large area that at the point of battle he did not have total numerical advantage. As Potter and Nimitz (1960) have commented, the Japanese did not need diversionary attacks or surprises, yet they persisted in doing so. These tactics had worked for them before, and they got used to assuming they would always work (Morison, 1967). Schwenk (1984) notes that repeated use of a strategy can make it difficult to develop alternative strategies. He calls this ''Problem Set.'' The result at Midway was a dispersion of the Japanese fleet over several million square miles of ocean, and when the battle was joined by the Americans, Yamamoto's other units were in no position to help Nagumo. As some Japanese naval officers observed afterwards: ''Here the planners indulged in one of their favorite, and in this case fatal, gambits – dispersion.'' (Fuchida and Okumiya, 1955, p. 233) Starbuck *et al.* (1978) suggest that top management, failing to see that their past decision rules and techniques have grown obsolete, are often the villains of crises. In their study of strategic decision-making in high velocity environments, Bourgeois and Eisenhardt (1987) point out the danger that prior success may put blinders on management, leading executives to pursue a strategy past its point of usefulness.

Dominant logic

Prahalad and Bettis (1986) suggest that a ''dominant logic'' develops among a top management group, and it affects the way the world is seen and interpreted and how decisions are made. They note that this may restrict managers' ability to appropriately react to situations which call for a different dominant logic, and so the organization continues down the path dictated by existing mindsets and world views.

Illusion of control

D'Aveni and MacMillan (1990) suggest that previous success may lead managers to ignore external crises because they believe them to be unimportant or transient. And because many organizations have never been in a crisis situation, they become complacent and are caught completely off-guard when a crisis does hit (Shrivastava and Siomkos, 1989). Having achieved a stream of successes, it is easy for management to fall prey to what Duhaime and Schwenk (1985) and Schwenk (1984) call an ''illusion of control.'' Galbraith (1983) notes that an organization's earlier success creates what he calls a ''center of gravity'' which becomes difficult to change. Miller (1993) argues that organizations lapse into decline when they develop so sharp an edge that they become excessively simple, and in so doing develop into inflexible entities on the road to failure. He perhaps expresses it best in his book The Icarus Paradox, where he writes:

> ''The power of Icarus' wings gave rise to the abandon that so doomed him. The paradox, of course, is that his greatest asset led to his demise. And that same paradox applies to many outstanding companies today: their victories and their strengths often seduce them into the excesses that cause their downfall. Success leads to specialization and exaggeration, to confidence and complacency, to dogma and ritual (Miller, 1990, p. 3).

On several occasions, Japanese commanders exhibited just this behavior. For example, when Nagumo first discovered there were American warships in the vicinity, he did not respond immediately but felt he could take care of them at his leisure (Potter, 1976). The lackadaisical, almost perfunctory, manner in which Nagumo's search pilots conducted their patrol was another example of overconfidence (Morison, 1967).

Prior hypothesis bias

Schwenk (1984) notes that managers who believe their present strategy is successful very often neglect negative information. Schwenk attributes this to what he calls ''prior hypothesis bias.'' Although up to the time of the attack on Midway, the Japanese did not know the whereabouts of the US carriers, Yamamoto remained confident and did not see fit to relay this information to Nagumo (Simkins, 1976). Because victories had come easily for the Japanese commanders, they might have been led to believe in their own invincibility. Thus Nagumo thought he could deal with the approaching enemy at his leisure, even though it was

obvious that his location must have been known to the enemy. Prior to the American carrier-based assault, Nagumo's forces had been attacked at least five different times by bombers from Midway. In the words of one historian, ''the warning was more than sufficient'' (Smith, 1966, p. 159).

Escalating commitment

An organization's decline may be visualized as occurring by degrees. In what Weitzel and Jonsson (1989) term the ''Blinded Stage'', which is the first stage of organizational decline, management fails to consider signals that indicate longer-term problems. One way of overcoming this is for executives to be on a constant lookout for threats, something which Nagumo failed to do. A second stage of decline is the ''Inaction Stage'', and is characterized by a failure to respond to signs of deteriorating performance. One begins to wonder if Weitzel and Jonsson (1989) had written their article with Nagumo in mind. Indeed, Weitzel and Jonsson indicate that organizational inaction is often due to management's tendency to increase commitment to the present course of action when things are not going well. One sees an analogy here with Yamamoto's order to his commanders to attack even after three of the four carriers had been sunk (Lord, 1967). Schwenk (1984) refers to this as ''escalating commitment'', a cognitive process which shapes how a decision-maker deals with gaps between objectives and performance.

Summary: success breeds dogma

Reality is socially constructed. The reality that the Japanese commanders constructed was largely shaped by their previous success. Yamamoto was the architect of Pearl Harbor raid, and Nagumo was commander of the task force whose planes devastated the US fleet on December 7, 1941. Midway was to have been the great finale to what they began at Pearl Harbor (Potter and Nimitz, 1960), and its planning, formulated to repeat their prior success, hinged on total surprise (Fuchida and Okumiya, 1955). In Yamamoto's mind, the American carriers were still at Pearl Harbor when the Midway operation got underway. Even though his intelligence reports failed to confirm this, they also failed to verify that the US carriers were anywhere near Midway. Yamamoto chose to take this as evidence that his assumption was correct, and remained confident that all was well (Simkins, 1976). It would appear that previous success did indeed narrow the Japanese commanders' perceptions, and made them overconfident about the efficacy of their strategy.

At Midway, cognitive biases operated uninhibited and unrecognized in the Japanese command. In retrospect, had Yamamoto and Nagumo been wise to the biases at work, the outcome could well have been different.

Decision process

Structure

As indicated in Figure 2, ''structure'' plays a vital role in the decision-making process. Bourgeois and Eisenhardt's (1988) study of the microcomputer industry indicates that in a ''high velocity'' environment, successful firms make decisions in a rational, structured manner. High velocity, in this instance, means rapid and discontinuous change in the environment, ''such that information is often inaccurate, unavailable, or obsolete'' (p. 816). Of the four cases that Bourgeois and Eisenhardt analyzed, the shortest time to a decision was three months. Compared to Midway, such an environment would be ''slow motion'' rather than ''high velocity''. Semantics notwithstanding, it appears that events at Midway argue against the notion that rational, analytical, and structured decision-making processes lead to better performance in a rapidly changing environment. In fact, it seems that volatility demands flexibility that an incremental process (Quinn, 1978) is better able to provide. Fiol and Lyles (1985) have pointed out that a centralized, mechanistic structure limits the degree of flexibility and tends to reinforce past behavior. We have previously demonstrated the dangers inherent in being blinded by past success. Dutton (1986) suggests that ability to act quickly is a prerequisite for crisis management. However, she also points out that the means to achieving this quick response is more centralization and formalization. Similarly, Driskell and Salas (1991) propose that organizations deal with stress by greater centralization of control and authority and by appealing to hierarchy. It is possible that what Miller (1993) calls the drive for simplicity may be at play here. By moving towards more centralization, organization members may be looking for a simpler way to handling the crisis. But as Midway has demonstrated, centralization did not do so well in a really high velocity situation, nor did it fare well in the face of crisis.

One of the main differences between Yamamoto's command structure and that of Nimitz was the level of centralization. Japan's planning for the Midway operation was autocratic, and the plan was rigid and very detailed. In contrast, Nimitz's instruction to his carrier commanders was simple and gave them a lot of latitude (Morison, 1967). This is not to say that analytical approaches are

irrelevant, for surely they add value in evaluating alternative strategies. For example, Sinha (1990) demonstrates that formal planning systems significantly contribute to decisions that are ''important'' and ''risky,'' though multivariate analysis was able to explain only 15 per cent of the variance. As Mintzberg (1975) suggests, successful strategic management often requires ideological heterogeneity which can be brought about by organic management styles and by instilling a sense of ''ownership'' of strategic decisions by those within an organization. Without going as far as Mintzberg and McHugh's (1985) concept of ''grass roots'' strategy formulation, or adhocracy, we may still accept that those below the level of the chief executive also play an important role in shaping an organization's strategy. Various researchers have noted the so-called Japanese management system's successful use of participatory management (e.g. Drucker, 1985, Nonaka 1988). It is interesting to note that 50 years ago, another Japanese organization (the Combined Fleet under Yamamoto) failed to take advantage of its middle managers' knowledge and expertise and consequently suffered a major defeat at the hands of an inferior opponent.

Leadership

In analyzing the decision processes at Midway, we need also to investigate the different leadership styles that the two respective CEOs exhibited. In addition to ''structure,'' leadership is a critical factor affecting decision processes (see Figure 2). Yamamoto exhibited what Bourgeois and Brodwin (1984) term the ''Commander Model'' of strategic management. This is similar to what Mintzberg (1987) calls a deliberate strategy. Schneider and Shrivastava (1988) call this the ''dependency'' theme, to denote that the organization and its members are dependent on a powerful leader to make decisions. As Bourgeois and Brodwin put it (1984, p. 243), the model ''assumes a purposive general manager directing the firm toward objectives defined at the apex of the organization,'' and strategy is rationally formulated from the seat of power of the CEO. For this approach to work, a critical criterion is accurate and timely information or that environmental changes are slow. Obviously, neither of these was true at Midway. We noted earlier how problematic Yamamoto's communications were, and we saw how the search plane's half-hour delay might have led to the destruction of Nagumo's carriers. Because the Commander Model is by definition rigid, it is no surprise that it lacks the flexibility so badly needed in a high velocity environment such as Midway. As Morison (1967) notes, a problem with a highly rigid plan such as adopted by Yamamoto is that ''it depends on the enemy's doing exactly what is expected. If he [the enemy] is smart enough to do something different – in this case to have fast carriers on the spot – the operation is thrown in confusion'' (p. 79). In other words, when things do not go according to plan, managers who are used to operating in a highly centralized environment simply do not know what to do.

In contrast, Nimitz seemed to operate under Bourgeois and Brodwin's (1984) ''Crescive Model''. Here, strategy is seen as coming upward from the frontline, instead of downward from the top. The CEO defines organization purposes and encourages innovation. Under such an approach, the organization achieves better performance when authority to plan and act is delegated downwards, to take advantage of the information that is gathered at the frontline. Nimitz, having set the goal of repelling the Japanese, allowed his managers to freely act to achieve the objective. Clearly, Spruance and Fletcher were given great latitude with which to act, while Nimitz limited himself to monitoring the situation as it developed. In fact, so entrenched was the concept of empowerment in Nimitz's mind that when some of his headquarters staff questioned Spruance's actions during the battle, Nimitz was quoted as saying (Potter, 1976, p.99):

> I'm sure Spruance has a better sense of what's going on out there than we have here. I'm sure he has a very good reason for this. We'll learn all about it in the course of time. From here we are not in a position to kibitz a commander in the field of action.

In Mintzberg and Waters' (1985) terms, this is a case of ''umbrella strategy'', which works well in a complex environment where centralized planning and decision-making is not appropriate. As the events at Midway have shown, the umbrella strategy performs well in a crisis situation because it mobilizes the entire organization in dealing with a rapidly changing environment. Nimitz expressed his Strategic Intent (Hamel and Prahalad 1989), which clearly stated the objective of repelling the Japanese and inflicting maximum damage at minimum losses, but leaving the means to his lower-level managers. German *et al.* (1991) call this ''Commander's Intent'', noting that it is the hallmark of the US military to give those at the frontline maximum adaptability. ''Strategic Improvising'' (Perry, 1991) takes the position that managers formulate and implement strategy at the same time, akin to Mintzberg's (1987) notion of ''crafting strategy''. The role of the strategic planners is not to specify every move in advance, but to instill a sense of vision that people within the organization will work

towards (Hamel and Prahalad, 1993). In a recent survey of 61 CEOs, Harrison (1992, p. 80) finds that ''conceivably many of them [CEOs] believe that active leadership by the CEO is not necessary for successful strategic decisions''.

An interesting and ironic aside is seen in Bourgeois and Brodwin's (1984) discussion of the ''Cultural Model'' of strategy. They note that this model, where the entire organization is committed to the goals and strategies which everyone participated in creating, is generally associated with ''Japanese Management''. We find in the Battle of Midway that it was partly because management failed to follow such an approach that Japan suffered its defeat.

Organization culture

An organization's success depends on more than just a strong leader. It has been suggested that the entire top management team must share values and possess qualities that fit well with the competitive environment to ensure strategic success (Hambrick, 1987). Other researchers extend this to include middle managers and their self-interest (Guth and MacMillan, 1986). As Mintzberg and Waters (1985) suggest, organizations are made up of people and no ''central leadership'' can totally pre-empt what others in such a social system want to do. This seems particularly true in an unstable environment. Weick (1987) notes that in a turbulent environment, people need to make meaning before they know what decisions to make. This process of meaning creation is the essence of culture. Pascale (1985) demonstrates the importance of corporate culture to bring about a certain degree of order and consistency. He suggests that through a socialization process, an organization can create a strong culture which enables it to deal with more ambiguity.

It is likely that because of the Commander approach adopted by Yamamoto, emphasizing rigid plans and centralized power, his officers did not participate in creating meaning. Rather, it was their sworn duty to obey orders from a superior officer that compelled them to action. The system of shared meaning was weakly linked and converged on Yamamoto. In a stable environment, and given the centralized management structure, this might have worked perfectly. However, at Midway, the system broke down. For instance, Yamamoto's real objective was to use Midway as bait to induce a fleet engagement with the Americans. He wanted to finish what was not completed at Pearl Harbor six months earlier. But his officers obviously did not all share the same vision. Consequently, Nagumo continued to prepare his planes for an assault on Midway even though American ships had been sighted. Instead of focusing on the central object – the destruction of the US fleet – the operation somehow evolved into a support mission for the invasion of Midway (Fuchida and Okumiya, 1955). Even Yamamoto seemed to have lost sight of the real objectives, as he sent two of his carriers on the diversionary attack of the Aleutians. Had the two carriers been available at Midway, Nagumo's losses would not have been insurmountable (Potter and Nimitz, 1960). As Willmott (1983, p. 515) puts it: ''Japanese confusion at Midway was but a symptom of a more general confusion of strategic direction''.

Decision and implementation

Decision parameters and the decision process merge in the third phase of our framework (see Figure 2), that of Decision and Implementation. Here, strategic decisions are made and strategies implemented. These strategic actions interact with environmental forces and result in certain outcomes; in the case of the Combined Fleet the destruction of their offensive capability. The experiences of these outcomes then feed back into the scanning and interpretation processes and result in learning.

Using Midway as a case in point, we see plenty of examples of how this works. We can take the initial strategic decision to attack Midway as an example. Yamamoto had been posted to the US before the war, and had seen first-hand the industrial capabilities of America. This had convinced him that a prolonged conflict with the US would be to Japan's disadvantage. What was needed was a quick and decisive victory. Hence Pearl Harbor. But that did not accomplish his objectives, since the American carriers were still at large. Hence Midway. Japan's previous success with surprise tactics and diversionary attacks had convinced its commanders that such strategies would always work. The Midway campaign was planned around such a strategy. And because of Yamamoto's leadership style and the centralized structure in the Combined Fleet, the decision making process did not provide the flexibility required to deal with a volatile environment such as Midway. These factors combined to form a rigid strategy implemented by commanders who did not share the vision or the meaning of the campaign and who were unequipped to deal with the crises that occurred. The volatility of the environment, and the unexpected reaction of the Americans, turned Yamamoto's Midway strategy into Japan's first major defeat and changed the course of the war in the Pacific.

Discussion

Half a century ago, an inferior force engaged a much larger foe off Midway Island. And won. History shows that the Battle of Midway was the turning point of the Pacific war (Fuchida and Okumiya, 1955; Smith, 1966). Decisions made during the battle had significant impact on the rest of the war, and they involved, by any account, substantial quantities of resources. It appears, therefore, the Battle of Midway meets the criteria for "strategic". And because it involved the US and Japan, who are today engaged in another sort of warfare, one with products rather than bombs, lessons learned from Midway would be of particular interest to those studying the current state of competition between these two countries. To help us better understand what took place, a comparison between the Japanese and American strategic processes (see Table I) is useful.

Using Daft and Weick's (1984) "interpretation system" as a basis, we developed a hybrid analytical framework (Figure 2) to study the strategic decisions made at the Battle of Midway. Decision parameters are formed as data on the environment are collected. This data collection is however affected by past history, bounded rationality, and cognitive biases which all work together to paint an incomplete and often tainted picture of what is really happening. Decision processes are a function of leadership style, management structure, and organizational culture. These interact with the decision parameters in the formulation and implementation of strategic decisions. The resulting outcome of Decisions and Implementation depends also on environmental factors, including competitive activities, and knowledge gained from these outcomes feeds back into the system to facilitate organizational learning and future decisions.

On a more operational level, we may surmise several themes from our analysis. First, we note the effects of cognitive biases, such as how Yamamoto and his officers were blinded by their previous success. They had become accustomed to having it their way, and were not prepared to accept alternative views. Their failure to re-evaluate the need for surprise and diversionary attacks, for example, was a major cause of their defeat at Midway. Second, from a decision process standpoint, it appears that in an extremely high velocity environment, what is needed is not structure but a lot of flexibility. Nimitz's instruction to his two carrier commanders was brief and offers quite a bit of latitude. He respected their roles as field commanders, and did not second-guess their judgements even though so much was riding on their success. Yamamoto's rigid planning and autocratic attitude rendered his fleet commanders incapable of dealing with contingencies, and when events unfolded differently from those envisioned, the operation was thrown into chaos. Third, we point out the importance of intelligence gathering and communication in strategic decision-making. This may seem obvious, but if it were so, Yamamoto and Nagumo would not have committed the blunder they did. At Midway, half an hour might have saved Nagumo from defeat. Or, if Yamamoto had conveyed to Nagumo that they still had not located the US carriers, Nagumo might have paid more attention to the approaching US ships. For the Japanese, both intelligence gathering and communications failed at Midway. And they paid the price. Fourth, a clear sense of strategic direction expressed through a shared system of meaning is necessary for strategic success. Clearly, the Japanese were engaged in several objectives which diverted their commanders' attention away from the true objective of the operation. Indeed, one may argue that each of the commanders was pursuing what he perceived to be the real objective, and that this was very different from what Yamamoto had envisioned. Allison (1971) provides a good discussion of this may happen. This we attribute to a weak system of shared meaning in the Japanese Combined Fleet, mainly as a result of Yamamoto's management style and a lack of participation by those under his command.

An ironic observation is how remarkably similar Nimitz's management style is to what is currently touted as Japanese Management. Empowerment, organic management, participative decision-making, entrepreneurial judo, visionary management, and commit-

Table I
Battle of Midway: comparative analysis

	Yamamoto **Japan**	**Nimitz** **US**
Environment	Turbulent	Turbulent
Management style	Autocratic	Participative
Planning	Rigid	Strategic intent
	Detailed	Fluid
Goal	Multiple	Single
Strategy	Deliberate	Crafted
Tactic	Surprise	Calculated risk
	Diversionary	Ambush
	"Fustest with mostest"	"Entrepreneurial judo"
Communication	From HQ	From field
Scanning	Perfunctory	Active
Execution	Scattered	Concentrated
	Lacks focus	Highly focused
Outcome	Defeat	Victory

ment are some of the key concepts that have been thrown around. A review of Nimitz's management of the Battle of Midway indicates that the American admiral was practicing all these things more than 50 years ago. Indeed, it has been argued that "Japanese Management" is itself a myth. Yang (1984) suggests, for example, that the so-called "consensus management" often associated with Japanese management is by no means typical of Japanese companies. He also reports other management problems that are ignored in the current fascination with Japan's economic success. Similarly, Matejka and Dunsing (1991) question whether such a thing as Japanese Management even exists. As Hamel and Prahalad (1993, p. 78) have noted, "there is no magic simply in being Japanese". The argument made here is that instead of attributing the Japanese economic "miracle" solely to its management practices, we should be aware of other factors that have contributed to Japan's success. What is more important is the recognition that good management beats poor management, and it matters not where the management practice comes from.

Research implications

This paper does not pretend to offer a complete analysis of the Battle of Midway. Instead, we seek to draw lessons in strategic management from historical records of the battle, and these have been discussed above. Would investigations into other similarly turbulent decision-making environments yield comparable findings? If so, we would achieve greater confidence in the results presented here. Alternatively, it may also be fruitful to test our model under different situations and see how we may better refine the model itself. Along these lines, other researchers may examine contemporary scenarios and identify whether some of the model parameters may have changed over time. Another direction of future research may be an investigation of the management styles of leaders such as Nimitz, Yamamoto, MacArthur, and so on. And of course, the Battle of Midway may be investigated in conjunction of other events of the Pacific war to give an even more complete picture.

In studying social systems, we should recognize that human sensations and perceptions are not only the subjects of study, but also play a role in the development of the knowledge of what is being studied (Peter, 1992). In other words, truth is a construction based on beliefs. Because researchers can only acquire knowledge through what they see and do, this knowledge is unavoidably subjective in nature. What is known is a product of the observer's interpretation; in essence "socially constructed" by the observer (Astley, 1985). As such, it is likely that an interpretive approach may generate valuable insights on culture and its effects on strategic decisions. As Morgan (1983) suggests, interpretive research:

> could achieve a new kind of objectivity in the social sciences that actively takes account of the importance of subjective meaning and individual action in the processes through which human beings construct their world (p. 396).

It has not been the intent of this paper to arrive at generalizable "laws" from a single case study. If anything is generalizable at all, it would be the insights that each reader experiences. Confidence in our findings will increase if other studies replicate the ethos of the present analysis. In terms of methodology, it is doubtful that a large scale empirical study can be performed on a phenomenon so immersed in "human" issues. Measurement problems would be a major hurdle in such an endeavor. But to the extent that quantitative analysis is possible, confirmatory findings will add credence to the arguments raised here.

Managerial implications

For practicing managers, this paper points out some of the dangers that may often be overlooked. For example, the need to establish a thorough search for and dissemination of competitive and market intelligence is clearly demonstrated. The manager is also reminded of the negative consequences of being blinded by previous success. If nothing else, this is step one in preventing managers from being complacent. As Hamel and Prahalad (1993, p. 76) have commented, "long-term competitiveness depends on managers' willingness to challenge continually their managerial frames." We discuss the importance of instilling a strong sense of "meaning" throughout the organization, and suggest maximum flexibility as the way to deal with chaotic and turbulent environments. All the while we stress that what is important is what goes on in people's minds, that reality is a social construction and not necessarily as represented by pages of statistics.

Notes

1 Originally, the reserve aircraft were armed with torpedoes and armor-piercing bombs to attack US ships. Against a land target, these weapons are much less effective. Since Nagumo's goal at this point was to attack the island itself, he ordered the torpedoes to be unloaded and regular bombs to be loaded onto the planes.

2 A carrier had to turn against the wind in order to launch aircraft. Because of wild maneuvering, the Japanese carriers were not in their proper launch positions.

3 A famous example of Nimitz's faith in his fleet commanders is his reluctance to interfere with Admiral Halsey during the battle of Leyte Gulf (e.g. see Falk, 1976). Halsey set off chasing the ''wrong'' Japanese fleet while leaving Leyte Gulf unprotected. Anxious moments ensued when another Japanese fleet approached the area, where American troops were engaging in an amphibious landing. Yet Nimitz refused to question Halsey's judgement until the very end, when he sent his famous ''Where is the Third Fleet? The world wonders'' message to Halsey. Thus, Nimitz's trust in his officers did not always yield the best results.

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Application questions

1 ''Reality is a social construction ...'' How would you interpret this statement in business terms? If this is the case, do the ''hard sciences'' of business have a part to play in successful strategy?

2 Take another historical event and extrapolate lessons for organizations from it.