

12-2004

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Roberto, Michael A., "Strategic Decision-Making Processes: Beyond the Efficiency-Consensus Tradeoff" (2004). *Management Department Journal Articles*. Paper 14.
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STRATEGIC DECISION-MAKING PROCESSES:
BEYOND THE EFFICIENCY-CONSENSUS TRADEOFF

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I would like to thank Teresa Amabile, Ralph Biggadike, Joseph Bower, Amy Edmondson, David Garvin, Susan Houghton, and Jay Lorsch and the anonymous reviewers for their helpful comments and suggestions. I am grateful to the Harvard Business School Division of Research for providing funding for this research project. Please note that company and individual names and data have been disguised.

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ABSTRACT

This study examines how managers make strategic decisions efficiently and simultaneously build the consensus often required to implement decisions successfully. The findings suggest that groups employed two critical processes – one substantive/cognitive and the other symbolic/political – in order to achieve high levels of both efficiency and consensus. On the substantive dimension, they gradually structured complex problems by making a series of intermediate choices about particular elements of the decision. On the symbolic dimension, they took steps to preserve the legitimacy of the decision-making process.

Keywords: Decision-making, Top management teams, Conflict, Consensus, Legitimacy

Many scholars contend that successful organizational performance requires both efficient decision-making and effective implementation (Bourgeois & Eisenhardt, 1988; Janis, 1989; Murnighan & Mowen, 2002; Nutt, 1993; Shull, Delbecq, & Cummings, 1970). Efficient decision making means that the process unfolds smoothly, and that managers select a course of action in a timely manner (Eisenhardt, 1989; Harrison, 1999; Mintzberg, Raisinghani, & Theoret 1976; Trull, 1967). Effective implementation means that managers carry out the selected course of action, and meet the objectives established during the decision process (Andrews, 1987; Dean & Sharfman, 1996). Scholars contend that managers must build consensus, defined as common understanding and commitment, in order to implement decisions successfully (Andrews, 1987; Bourgeois, 1980; Bower & Doz, 1979; Child, 1972; Drucker, 1954; Wooldridge & Floyd, 1990). In sum, in order for firms to perform well, managers must make high quality decisions in an efficient manner, and simultaneously build consensus in order to facilitate implementation.

Although scholars contend that effective performance requires both efficiency and consensus, much empirical evidence indicates that managers need to make tradeoffs when leading decision processes. In fact, scholars often argue that efforts to build consensus decrease efficiency, while attempts to enhance efficiency inhibit the development of understanding and commitment (Amason, 1996; George, 1980; Hickson, Wilson, Cray, Mallory, & Butler, 1986; Janis, 1972; Schweiger, Sandberg, & Ragan, 1986; Vroom & Yetton, 1973). Thus, the decision-making literature presents a puzzle. It suggests that successful firm performance requires an efficient decision process and effective implementation, but it does not explain how managers can achieve both outcomes simultaneously. Therefore, this hypothesis-generating study addresses the following question: How do managers make decisions in an efficient manner and build the consensus often required to implement those decisions successfully?

CONCEPTUAL BACKGROUND

Several prominent decision-making researchers (George, 1980; Janis, 1989) have proposed models of the multiple tradeoffs that managers encounter as they make decisions. These models articulate a tradeoff between “the need for acceptability, consensus, and support” and the “expenditure of precious time and other policymaking resources” (George, 1980, p. 2). Two streams of research support this contention that managers will find it difficult to achieve efficiency and consensus simultaneously. One stream focuses on behavioral dimensions of the process, including participation, conflict, and politics. A second stream focuses on cognitive process dimensions such as the modes of alternative evaluation and analysis. According to both research streams, the factors that promote efficiency tend to reduce consensus, and vice versa.

Many scholars have argued that subordinate participation leads to higher commitment and understanding (Kim & Mauborgne, 1991; Tannebaum & Schmidt, 1958; Vroom & Yetton, 1973; Wooldridge & Floyd, 1990). By contrast, other scholars asserted that participation decreases efficiency (George, 1980; March & Olsen, 1976; Vroom & Yetton, 1973). For instance, one study found that CEOs who made fast decisions consulted their management teams, but “focused on obtaining advice from one or two of the firm’s most experienced executives” (Eisenhardt, 1989, p. 559). Moreover, “the CEO was always in charge, and acted as something of a dictator” (Bourgeois & Eisenhardt, 1988, p. 830).

Scholars have also found that debates tend to decrease efficiency (George, 1980; Janis, 1972; Schweiger, et al., 1986), and that conflict leads to process interruptions and delays (Hickson, et al., 1986; Mintzberg, et al., 1976). By contrast, others proposed that disagreement may enhance consensus. Kim and Mauborgne (1997) asserted that individuals perceive decision processes to be fair, and therefore, commit to decisions if they can “refute the merits of one another’s ideas and assumptions” (Kim & Mauborgne, 1997, p. 69). Amason (1996) distinguished between two forms of conflict: cognitive (task-oriented) and affective

(interpersonal). Though he did not provide conclusive evidence, Amason hypothesized that groups that encourage cognitive conflict, while avoiding affective conflict, achieve higher commitment and understanding. According to this body of work, disagreement may slow the pace down, but if managers avoid personal friction, it can enhance consensus.

Studies have also found that politics decreases efficiency (Eisenhardt & Bourgeois, 1988; Hickson, et al., 1986; Janis, 1989; Mintzberg, et al., 1976). These scholars argued that, “it takes time, energy, and effort to engage in attempts at intra-organizational influence” (Pfeffer, 1992, p. 321). On the other hand, seeking allies and lobbying others may be constructive, particularly with respect to building commitment and understanding (Baldrige, 1971; Bower, 1970; Pettigrew, 1973; Pfeffer, 1992; Sapolsky, 1972). Politics can help generate support for projects, and may persuade others of the merits of a decision. Overall, this stream of research suggests that participation, conflict, and politics all may impede managers from making timely decisions, yet these behaviors can foster consensus.

The second stream of research infers that comprehensive alternative evaluation and formal analytical procedures foster consensus, but decrease efficiency. Scholars have argued that a thorough analysis of multiple alternatives slows the decision process (Frederickson & Mitchell, 1984; Janis, 1972; Schweiger, et al., 1986). Eisenhardt’s work (1989) suggests that the mode of alternative evaluation matters more than the number of options. She asserted that a breadth-not-depth approach enhanced efficiency. In particular, faster decision makers “developed many alternatives, but only thinly analyzed them” (Eisenhardt & Zbaracki, 1992, p. 22). Moreover, they analyzed alternatives simultaneously, rather than sequentially. By contrast, studies have shown that an in-depth analysis of a small set of alternatives fosters consensus. These scholars argued that groups should scan many options, but they must perform a thorough evaluation of a few of the most attractive alternatives in order to build commitment (Amason,

1996; George, 1980; Janis & Mann, 1977). These findings imply that a *breadth-then-depth* strategy may foster consensus, while a *breadth-not-depth* strategy maximizes efficiency.

Similarly, scholars have argued that formal analysis slows down the decision process. Eisenhardt (1989) found that fast decision makers rely on “real-time” information gathered by continuous environmental scanning, while slow decision makers rely on data from formal planning and budgeting systems. Others also argued that formal analysis inhibits efficiency (Bhide, 1994; Frederickson & Mitchell, 1984). On the other hand, Bower (1970) stressed that formal analytical procedures may provide a means of educating executives about a project and acquiring their support. He found that managers utilize formal techniques because “they must defend their judgments to top management in financial terms” (Bower, 1970, p. 309). Others found that formal analysis may help to persuade others of a proposal’s merits (Langley, 1990; Sapolsky, 1972). In sum, formal analysis may decrease efficiency, but it can enhance consensus when used to justify and “sell” a decision to others in the firm.

These two streams of research, summarized in Table 1, imply that managers must make tradeoffs between achieving efficiency and consensus. While acknowledging potential tradeoffs, scholars continue to contend that successful firms must achieve high levels of both efficiency and consensus. They argue that efficient decision making enhances firm performance because it facilitates adaptation to rapidly changing environmental conditions (Eisenhardt, 1989; Harrison, 1999; Rajagopalan, Rasheed, & Datta, 1993; Trull, 1967). On the other hand, inefficient decision-making limits opportunities for learning and improvement, while providing competitors with opportunities to establish first-mover advantages (Eisenhardt, 1989). Similarly, scholars propose that consensus increases performance by enhancing a firm’s ability to implement decisions (Andrews, 1987; Bower & Doz, 1979; Child, 1972; Drucker, 1954; Quinn, 1980; Schweiger, et al., 1986; Wooldridge & Floyd, 1990). They argue that consensus promotes

the cooperation and coordination required to implement decisions successfully. While these scholars contend that managers *should* achieve both efficiency and consensus, they have not presented research that explains *how* managers can accomplish this. If anything, prior research suggests that efforts to improve one element of decision-making performance will undermine improvement along other dimensions. That puzzle motivates this study's central research question: How do managers make decisions efficiently and simultaneously build the consensus often required to implement those decisions successfully?

Insert Table 1 about here

RESEARCH DESIGN AND METHODS

I chose to conduct an inductive study for several reasons. To answer the research question, I felt that it was important to identify subtle differences in the timing and sequence of key activities throughout the decision process, and to examine how they affected a group's ability to reach closure. I also wanted to identify critical junctures during a decision process, and to understand what influenced people's behaviors and shaped their perceptions at these times. These issues seemed important when trying to explain how managers achieved efficiency and consensus simultaneously. Prior research had not addressed these issues adequately, and thus, did not appear to offer clear, compelling predictions regarding the research question.

The multi-method field study design draws upon qualitative and quantitative evidence. I selected this approach given that "a how or why question is being asked about a contemporary set of events over which the investigator has little or no control" (Yin, 1994, p. 9). This research design has several distinctive features. First, I employed a systematic sample selection process to insure that the decisions were similar along multiple dimensions. The sample consists of 10 decisions across 3 subsidiaries of a firm operating almost entirely in one industry. This design provides controls for industry structure as well as the internal structural context (Bower, 1970).

I also controlled for situational factors such as the level of uncertainty and novelty in each decision (Papadakis, Lioukas, & Chambers, 1998). These controls, not included in many studies, bolster the internal validity of this research. In addition, I collected qualitative and quantitative data from many informants across multiple organizational levels. Two readers analyzed and coded the qualitative data. These methods enhance reliability and construct validity by providing “converging lines of inquiry” (Yin, 1994, p. 92).

Sample

The sample consists of 10 strategic decisions made by managers at three subsidiaries of Military Engineering Inc. (MEI). The three business units are: Naval Warfare, Vehicle Systems, and Advanced Electronics. The corporation competes almost exclusively in the defense industry, and has performed exceptionally in recent years. To select the sample, I asked each business unit’s senior executives to generate a list of strategic decisions made within the past 18 months. The study focused on recent decisions in order to enhance the accuracy of retrospective reporting (Huber & Power, 1985). I defined “strategic” decisions as important choices that:

- had a significant expected impact on future firm performance (Bourgeois & Eisenhardt, 1988; Mintzberg, et al., 1976);
- involved multiple functional organizations (Bourgeois & Eisenhardt, 1988);
- represented a significant commitment of financial, physical, or human resources (Bower, 1970; Mintzberg, et al., 1976);
- and exhibited high complexity (Mintzberg, et al., 1976; Schweiger, et al., 1986).

In a one-hour group meeting, the business unit managers and I discussed whether each decision met these criteria. In total, this process generated 14 candidates for inclusion in the study. Next, the chief executive and all direct reports completed a survey, with 7-point Likert-type scales, that evaluated the following situational characteristics of each candidate:

- threat/crisis (Dutton & Jackson, 1987; Papadakis, et al., 1998; Rajagopalan, et al., 1993)
- uncertainty (Mintzberg, et al., 1976; Papadakis, et al., 1998; Rajagopalan, et al., 1993)
- novelty (Hickson, et al., 1986; Mintzberg, et al., 1976; Papadakis, et al., 1998)
- time pressure (Papadakis, et al., 1998; Rajagopalan, et al., 1993; Vroom & Yetton, 1973)

I selected these four characteristics because recent studies demonstrated that these factors affect the nature of decision processes (Hickson, et al., 1986; Papadakis, et al., 1998; Rajagopalan, et al., 1993). Table 2 describes the survey utilized to measure these four situational factors. Note that the eta scores all exceed 0.20. This indicates a substantial amount of agreement within each group of decision makers, and therefore, allows for the creation of a decision-level score for each question (Amason, 1996; Florin, Giamartino, Kenny, & Wandersman, 1990; Pelled, Eisenhardt, & Xin, 1999). The alphas range from 0.75 to 0.80, indicating that composite variables may be created based upon the responses to the multi-item survey instruments, and that these composite scores will generate reliable measures of each construct (Frederickson & Mitchell, 1984; Nunnally, 1967; Papadakis, et al., 1998).

Insert Table 2 about here

In total, 145 respondents provided data regarding the 14 candidates (10.4 respondents per decision). I discarded the decision(s) in each subsidiary that exhibited the lowest levels of threat, uncertainty, novelty, and time pressure, because I wanted to study the most difficult, non-routine decisions made in this firm. The final sample consists of at least 3 decisions per subsidiary and 10 decisions overall. Table 3 provides a brief description of each decision in the sample.

Insert Table 3 about here

Data Collection

After selecting the sample, I conducted separate 90-minute interviews with 78 informants, for an average of 7.8 informants per decision. I selected the informants by asking

senior executives to identify the key participants in each decision process, and by asking those individuals to identify others that also were involved in the decision. I did not focus exclusively on top team members as many studies have (Amason, 1996; Bourgeois & Eisenhardt, 1988; Knight, et al., 1999). Instead, I gathered data from individuals across four organizational levels, since studies indicate that the processes unfold across multiple levels (Bower, 1970; Burgelman, 1983). To insure accurate data collection, I taped and transcribed all interviews, and adhered to the “24 Hour Rule” for recording my notes (Bourgeois & Eisenhardt, 1988). I employed several tactics to counteract retrospective reporting biases. I interviewed multiple informants per decision, provided confidentiality, and cross-checked their recollections against each and against company documents. In addition, I asked the informants to review key documents prior to the interviews in order to refresh their memories (Huber & Power, 1985; Yin, 1994).

I employed the three-stage Critical Decision Method for conducting the interviews (Klein, Calderwood, & Macgregor, 1989). First, I obtained an unstructured account of the decision process. Second, I constructed a timeline by recording important dates as well as the sequence and duration of key events. Moreover, I inquired about important cognitive events such as key turning points in people’s thoughts and perceptions. Finally, I employed a series of probes to learn more about process characteristics such as the mode of alternative evaluation (Eisenhardt, 1989; Janis, 1972) and the use of analogies (Klein, 1998; Neustadt & May, 1986).

Each informant responded to a survey upon completion of all interviews. This survey measured efficiency and consensus. Because the same individuals provided data about the dependent and independent variables, it’s possible that people offered biased recollections of the process. However, the use of many independent informants, as well as other elements of the interviewing technique, alleviated this potential bias. The high level of agreement among the

informants (indicated by the eta scores all above 0.20) supports this contention. When interviewed, individuals did not know which outcomes I would measure. In addition, the consensus variable included an indirect measure of common understanding. As a result, individuals did not report the level of consensus for each decision, but instead, I derived it from an evaluation of each group's responses. When I presented these findings to the managers, they were surprised at the level of consensus for some decisions. Most importantly, I re-examined these decisions one year later, and used document analysis, rather than interview or survey data, to evaluate the effectiveness of each implementation process.

Consistent with past research, I defined consensus as a multiplicative function of understanding and commitment (Dess, 1987; Wooldridge & Floyd, 1990). Commitment represents the extent to which people support the decision, and are willing to cooperate in its implementation. Understanding means that managers have a common comprehension of the decision rationale (Amason, 1996). This study defines efficiency more broadly than decision speed (Eisenhardt, 1989; Schilit & Paine, 1987). Decision speed refers to process duration, defined as the period from "first reference of a deliberate action" to "the time at which a commitment to act is made" (Eisenhardt, 1989, p. 549). In short, maximizing speed means minimizing duration. Two problems exist with this concept. First, it's not necessarily appropriate to compare durations across different decisions. Second, duration implies a clear starting and ending point, which managers found nearly impossible to identify in this study.

In this study, efficiency refers to the "prudent management of time and other policymaking resources" (George, 1980, p. 2). It means that managers employed the resources, and engaged in the number of process iterations, necessary to make a decision in a timely and cost effective manner. I developed a new ten-item survey to measure efficiency. Five questions

asked managers to examine different types of process iterations, such as the reconsideration of alternatives and the revision of goals, and to indicate whether they engaged in an optimal number of iterations (Janis, 1972; Mintzberg, et al., 1976). The other five questions measured whether they employed different types of resources prudently (George, 1980). Table 4 describes each survey measure. Once again, the eta scores exceed 0.20, thereby justifying the aggregation of individual responses to decision-level scores. The alphas range from 0.80 to 0.91, indicating that composite variables may be created based upon the responses to the multi-item survey.

Insert Table 4 about here

Data Analysis

With the survey data, I utilized principal components analysis (PCA) to generate decision-level scores for efficiency and commitment. PCA generated more reliable data composites than the traditional technique of averaging the responses to each question. The averaging technique implicitly would assign equal weights for each survey item. Instead, PCA identified the “optimal” weights to be utilized when forming composites (Afifi & Clark, 1993).

I computed decision-level understanding scores using the “distance score” method (Amason, 1996; Dess, 1987; Wooldridge & Floyd, 1990). In the survey, managers allocated points among six categories of concerns to indicate the relative importance of different concerns that influenced the decision. For each decision, I computed the standard deviation of the points assigned to each category, and added the standard deviations across all categories. This calculation measured the *lack* of shared understanding among decision makers. To measure common understanding, I simply subtracted this “distance score” from a constant. Finally, I constructed the consensus measure by standardizing the decision-level scores for commitment and understanding, and multiplying them together (Wooldridge & Floyd, 1990).

For the interview data, I developed a coding scheme that enabled me to analyze the transcripts, and to identify and classify process characteristics. Coding proceeded in two phases. The first phase consisted of codes assigned to sections of transcript. The codes identified key *events, phases, and group interactions* during the decision process. For instance, the “Alt” code identified the generation of an alternative, and the “Cont” code referred to the description of a contingency plan. In the second phase, I assigned codes to each decision process as a whole. These codes identified the *strategies and techniques* employed in each process. To assign these codes, I reviewed the previously coded transcripts as well as company documents. For example, the “Dev” code indicated the presence of a Devil’s Advocate during the process. In order to assign this code, 3 or more transcripts had to provide evidence of this technique. For the second phase, I created a checklist with a complete set of decision-level codes, and marked the checklist to indicate whether managers employed particular strategies or techniques during that process.

A second reader coded three of the ten decisions studied. I took several steps to facilitate the coding process for this individual. I furnished the second reader with detailed written definitions of each code, discussed each definition with him, and then revised the coding scheme in order to clarify points of confusion. I also provided the reader with written descriptions of the industry and the firm, profiles of the key individuals involved, and definitions of acronyms and terms mentioned during the interviews. After coding the first three decisions, I evaluated the reliability of the coding scheme. Inter-reader reliability was defined as the percentage of agreements between the two readers (Miles & Huberman, 1994). For the first phase of the coding scheme, an agreement consisted of the same code being applied to a particular passage of transcript. For the second phase, I recorded an agreement if the two readers placed a check mark next to the same category on the checklist. Inter-reader reliability for the first three decisions

equaled 71%. Given this evidence of the reliability of the coding scheme, I analyzed the remainder of the decisions without the assistance of the second reader.

Finally, I searched for relationships between process characteristics (measured by the coding scheme) and the outcome variables (measured with survey data). To do so, I dichotomized the scores for efficiency and consensus into low and high categories based upon the median value of each variable (Bourgeois, 1980). This placed each decision into one of four categories (high/high, high/low, low/high, and low/low). In my analysis, I recorded the number of decisions in each category that possessed particular process characteristics. This enabled me to identify relationships between process characteristics and the outcome variables, and to generate propositions regarding how managers achieve efficiency and consensus simultaneously.

OVERVIEW OF THE FINDINGS

In this sample, the groups did not always achieve efficiency at the expense of consensus, or vice versa. In three cases, they achieved high levels of efficiency and consensus. Others achieved poor results along both dimensions, or encountered mixed results. Figure 1 lists the decisions that fell into each category after I dichotomized the scores for the dependent variables. It also provides the mean values of efficiency and consensus for the decisions in each quadrant. Note that business unit was not confounded with decision categorization. Each business unit has one decision in the “high/high” category and one decision in the “low/low” category.

Insert Figure 1 about here

As noted earlier, I re-examined these decisions one year after I conducted the field research. I reviewed many private and public documents about the implementation efforts, and coded each implementation as a positive, mixed, or negative outcome. The MOD, CVP, ALL, and NEW decisions resulted in positive outcomes such as new contracts, increased revenues, and productivity improvements. The LEV, ORG, and SOF decisions encountered substantial

implementation problems including cost overruns, dismantled alliances, and lost contracts. The other decisions achieved mixed results. These findings suggest that efficiency and consensus were positively related to implementation success. The second coder also evaluated each implementation based upon document analysis. We agreed on 9 of the 10 evaluations.

The remainder of this paper presents a series of propositions regarding how some groups achieved efficiency and consensus simultaneously. First, the paper describes three propositions associated with the cognitive dimension of the decision process. These propositions concern how groups generated and evaluated alternatives, and how they selected a course of action. Then, I turn to the political aspect of the group process. These propositions address how managers tried to enhance the legitimacy of their decision-making processes, and how others perceived these efforts. I conclude the paper by presenting a conceptual framework that attempts to explain how groups achieve both efficiency and consensus. I generated this framework inductively based upon the propositions that emerged from the data analysis.

COGNITIVE DIMENSION

The results suggest that groups attained greater efficiency and consensus if they made a series of small but critical choices during the process, rather than focusing entirely on the final selection of a course of action. These choices concerned the decision criteria, the elimination of options over time, and the specific events upon which the final choice was contingent.

Decision Criteria

In many decisions, people staked out positions quickly, and became entrenched in those positions. Then, the groups found it difficult to reconcile divergent views, overcome obstacles, and avoid impasse. The more effective groups made problems more tractable as a means of generating progress. They made a series of critical choices at various points during the process. For example, they chose well-defined criteria before analyzing and debating a set of alternatives.

To illustrate, consider the example of the ALL decision at the Naval Warfare Division. In this case, managers tried to select one or more strategic alliance partners for a major new U.S. Navy program. The chief executive sensed that people had loyalties and biases toward various potential teammates. He wanted to avoid an emotional confrontation between opposing camps. Therefore, he advocated the development of an explicit set of criteria for evaluating each option:

“I don’t think any of us woke up one day and said, golly, this is the way that we have to approach this. I think we gradually reached that point after struggling and not finding an easy answer to a very complicated question. We said, ok, the smartest way to approach this would probably be to identify these criteria that are important to us in a teaming relationship. The mission was to try to remove as much of that bias as we could, recognizing that it will never be gone. But by forcing people to take each of these factors and discuss them, we felt that we could at least force people to render an honest perspective, or precipitate an honest debate among different individuals in the room. But in order to get everybody on the same baseline, we decided that we had to define each one of these factors or criteria.”

One of the other process facilitators described how they used the well-defined and stable set of criteria to resolve disputes that arose during the decision process:

“What we had to do in a number of cases was to bring people back to the definitions and the parameters. That was very helpful at times, because people would be arguing something on a particular aspect and we had to jump in and say that doesn’t really apply here. People were willing to follow those guidelines, which again takes us back to the importance of defining the criteria clearly up front.”

While these process facilitators maintained a stable set of criteria, low efficiency/consensus groups either never tried to define criteria explicitly, or the criteria became ambiguous as the groups revisited options repeatedly. Low levels of efficiency and consensus didn't result from a lack of multiple criteria. In fact, all groups considered many factors. However, groups fared poorly when the criteria were ambiguous or changed frequently during the process. I coded all ten decisions, and found a pattern linking efficiency and consensus with criteria definition.

Proposition #1: Managers achieve higher levels of efficiency and consensus when they establish well-defined and stable decision criteria prior to analyzing and debating alternative courses of action.

Tables 5 identifies the number of decisions in which managers established well-defined criteria prior to debating alternatives, and demonstrates that this approach typically resulted in greater efficiency and consensus. In particular, note that groups employed this practice in all three of the high efficiency/high consensus decisions, but in none of the low efficiency/low consensus cases. The table reports similar data for all propositions presented in this paper; in addition, Table 6 provides further detail regarding each proposition.

Insert Tables 5 and 6 about here

Explicit definition of evaluation criteria facilitates efficiency and consensus because it makes unstructured problems more tractable. It insures that managers conduct “apples to apples” comparisons of the alternatives, and helps to surface underlying causes of disagreement. Second, this practice establishes common ground and superordinate goals (Sherif, 1979). Common objectives provide a means of resolving conflict and eliminating dysfunctional political behavior (Eisenhardt, Kahwajy, & Bourgeois, 1997; Hackman, 1990). Third, well-defined criteria provide a structured means of evaluating different alternatives. Managers develop an

understanding of a common reference point or yardstick (Russo & Schoemaker, 2002). This prevents the problem of trying to “hit a moving target” during the decision process.

Alternative Evaluation: A Wining Process

The high efficiency/high consensus groups did not try to choose directly from the entire set of options. Instead, they identified many alternatives, and formed subgroups of similar options. Then, they eliminated one or more subsets of options, and proceeded to evaluate the remaining alternatives. For instance, in the SOF Decision, the chief executive described how they identified three types of alternatives, and then pared the list of options:

“It was a winnowing process. What we were doing was gradually taking things off the table. In my mind, what you don’t want to keep doing in a decision making process is having to review all the alternatives over and over. You’ve got to start taking alternatives off the table. And so the first thing that went off the table was the ‘invest on our own’ strategy. The second thing that went off the table was apparently people that were more publishing guys rather than technical authoring folks. And then finally, we came down to the few technical guys.”

Similarly, the CVP alliance decision came about through a “winnowing process”, as the Vice President of Engineering described:

“The first thing was, do you want to play at all or not? Second, do you want to be prime [contractor] or not? Third, given you don’t want to be prime, you’ve gotten past that decision, who would you team with? That’s the hierarchy of things.”

By contrast, I found that managers did not eliminate options systematically in the low efficiency/ consensus decisions, but instead, revisited the entire list of alternatives repeatedly. For example, on the LEV decision, managers discussed five alternatives for a long period of

time. Eventually, they developed a comparative analysis, and settled on what one manager called a “mediocre compromise.” Another executive described his frustration:

“We went through this whole harangue and analysis of all the options... and I think at the end of the day, it was sort of a decision. Maybe it’s a compromise. We kind of did a little of everything.”

In other words, if we think of these problems as large decision trees, then it appears that groups employed two contrasting analytical strategies for “solving” the trees. The more effective groups pruned branches off the tree systematically, while the others tried to analyze all of the tree’s endpoints simultaneously. The latter strategy may be cognitively overwhelming, while the former appears to be a more manageable approach to alternative evaluation.

The data in Table 5 suggest a relationship between the winnowing technique and the outcome variables. Table 5 shows that none of the low efficiency/low consensus groups employed the winnowing technique, while two of the other three high efficiency/high consensus groups utilized this practice. This evidence led to the following proposition:

Proposition #2: Managers achieve higher levels of efficiency and consensus when they eliminate subsets of options in a systematic manner rather than revisiting the entire list of alternatives throughout the decision process.

This “winnowing” procedure enhances efficiency and consensus because it breaks a large, ill-structured decision down into smaller, more manageable pieces (Maier & Maier, 1957). It also makes the evaluation process more transparent, thereby enhancing decision understanding. This transparency may enhance people’s perception of the fairness of the process (Kim & Mauborgne, 1997). Finally, this approach builds momentum gradually rather than trying to move to closure in one giant step (Haspelagh & Jemison, 1989).

Contingent Choices

The final type of intermediate choice occurs when managers make a tentative decision contingent upon *specific* events unfolding in the near future. This differs from contingency planning (Janis & Mann, 1977) or “execution triggers” (Bourgeois & Eisenhardt, 1988), which managers employed in nearly all of the decisions. This approach identifies contingencies to be explored *prior* to implementation, while traditional contingency plans or execution triggers focus on different ways to react *during* implementation.

For example, in the CVP Decision, a majority of the group wanted to serve as a subcontractor in a strategic alliance with a leading aerospace firm. However, several managers had concerns about this choice. They would only support this decision if Vehicle Systems could secure an adequate share of future contracts. Thus, managers made a tentative decision subject to certain conditions. In less successful cases, managers sometimes identified a need for flexibility, but didn’t specify key contingencies clearly. The more effective approach represents much more than a simplistic “keep your options open” mentality. Note the specificity of the contingencies in the CVP Decision, as described by one executive:

“What we want to do, if we can cut the right deal with AeroWorld., is have them prime and we will go sub provided that we get the content that we need. The content has to come in both technical merit content and dollar content. We took all the content in the vehicle. We rated it priority, 1 through 5. If they said yes to all the must-haves, [and] if we get two or three of the number 2’s, we’d hit the 25% [dollar content] target. The conclusion that we came to was that we would get all our #1 priority stuff, and we would get enough #2 priority stuff, to make up 25% of the program. At that point time, I was preaching to the management team here [that] we ought to sign up.”

Managers employed a similar approach on the MOD Decision. They chose to make a substantial capital investment to modernize the facility presuming that they could secure financial support from the state, the city, and the U.S. Navy:

“I think we said we are going to do this, but we are going to do this if we can get x, y, and z... We said we are going to do this, if we get this. It was always contingent on certain events happening.”

In some sense, this decision-making practice resembles a “real options” approach to strategy development (Kester, 1984; Luehrman, 1998). A “real option” exists when firms have the ability to delay investments and decisions until they acquire additional information. In these situations, managers must “purchase” this option by making a small investment at the outset. In the MOD Decision, the Director of Strategic Planning described the up-front investment:

“[There was] a willingness to spend money up front, whether it’s on lawyers, environmental consultants, the construction manager, or on political consultants, communication people. For us, we spent a fair amount of money on these things...it got some thoughts going, got the process moving and I just don’t think we could have done it on a few nickels and then said go.”

Managers did not employ this approach very often, but when they did, it yielded favorable results. Table 5 summarizes the number of incidences of the “real options” approach in each condition. Note that two of the three high efficiency/high consensus groups employed this technique, while none of the low efficiency/low consensus groups did so.

Proposition #3: Managers achieve higher levels of efficiency and consensus when they make a tentative choice, contingent upon the occurrence of specific events prior to implementation.

This “real options” approach to strategic decisions has many parallels to the concept of contingent contracting prescribed by negotiation scholars. They have argued that contingent contracting enables parties to resolve disputes effectively (Bazerman and Gillepsie, 1999). Similarly, during group decision processes, the “options” approach leads to greater efficiency and consensus because it creates a way to bridge differences and break an impasse. It helps to alleviate people’s concerns about a decision prior to committing to full-scale implementation. Moreover, this practice provides an opportunity for additional learning prior to a final decision, and allows managers to resolve uncertainty before moving forward in a definitive fashion.

These three propositions suggest that the high efficiency/high consensus groups established certain parameters, narrowed their focus over time, and developed closure in stages. This series of intermediate choices enabled them to make progress and build momentum despite various cognitive and social-emotional obstacles that arose during the decision process. It made a final solution more achievable, while simultaneously mitigating interpersonal tensions.

THE POLITICAL DIMENSION

Many scholars have found that political forces play a critical role in organizational decision-making (Bower, 1970; Eisenhardt & Bourgeois, 1988; Pettigrew, 1973; Pfeffer, 1992). They have shown that managers engage in political behavior in order build support within the firm for their proposals. This study’s findings focus on how managers often try to persuade others of the merits of their *decision process* in order garner support for a particular choice.

Equal Access to Information

In this organization, managers typically gathered a great deal of information during a decision-making process. Individuals used the information to support their arguments, justify assumptions, and persuade others to endorse their proposals. Often, they presented extensive amounts of data to convince others that they had done a thorough investigation of the issues at

hand. However, individuals employed two quite different approaches to disseminating that information prior to critical group meetings. In some cases, managers provided each attendee with all available information prior to key meetings. In other instances, managers provided some colleagues with more information than others. In many cases, this occurred because individuals tried to “pre-sell” a few key executives on the merits of their proposals prior to meetings, and to build a coalition that would support them during the group deliberations. To persuade these influential executives, individuals provided them with access to key data prior to group meetings.

The failure to disseminate information to all participants prior to key meetings created perceptions of an unfair process. During a group discussion, people felt disadvantaged if they were examining data for the first time, while others had reviewed it earlier. Individuals also questioned whether their views and opinions were truly valued, if others had failed to share information with them. In addition, participants wondered whether they could influence the opinions of those with privileged access to data, or whether these individuals had established strong preconceived notions about the issue prior to the group discussion.

The RES decision illustrates the problem caused by unequal dissemination of information. One executive shared data about various alternatives with only a few other staff members prior to a major off-site meeting. When he did provide extensive data to the entire group, individuals were not impressed by the thoroughness of the intelligence gathering effort, but instead, felt as though he was presenting them with a *fait accompli*. The Vice President of Engineering explained what happened at the start of the off-site meeting:

“We had an off-site meeting, and Dave tried to show the team that he had investigated all the options carefully. Ron and I were the only people besides Dave who had examined the data at that point. It became apparent very quickly to the rest of the staff, after they didn’t see me shrink like a violet in my chair, that I had seen the data

already. So I'm a bad guy right away... I don't think that this decision was pre-ordained, but that's what many people believed during and after that discussion, even to this day."

Similarly, in the LEV Decision, the Director of Strategic Planning noted that the group engaged in a series of unproductive meetings because people had been selectively disseminating data in order to pre-sell their proposals. This caused individuals to become frustrated, and to question whether they could truly influence the direction of the group discussion. By contrast, in the ALL decision, the strategic planners provided a comprehensive set of information about potential alliance partners to all participants. In addition, individuals were asked to provide each other with any pertinent reports, white papers, etc. prior to group deliberations. Naval Warfare's CEO explained why this common database facilitated constructive debate:

"If people disagreed about a potential partner, we would ask: 'Where are you coming from and why do you say that? What's your concrete evidence?' One person might pull out this U.S. Navy report that described a weakness in a competitor's technological capability. Another might provide an analyst's report that described how a recent acquisition improved those capabilities. Everyone had access to these reports. There were no games with the data. It was an open process."

The data suggest that unequal distribution of information can inhibit a group's ability to achieve efficiency and consensus. Table 5 shows that all three of the high efficiency/high consensus groups provided equal access to information prior to key meetings, while only 1 of the 3 low efficiency/low consensus groups did so. This evidence led to Proposition #4.

Proposition #4: Managers achieve higher levels of efficiency and consensus when participants have equal access to information prior to key group meetings.

Unequal access to information before group meetings creates the perception that others only want to create the appearance of a fair and comprehensive process. It also promotes the formation of factions within the group (haves vs. have-nots). Finally, it discourages minority dissent, because individuals feel the pressure to defer to the “experts”, i.e. those who had more time to digest the data. For these reasons, it has a negative effect on efficiency and consensus.

Token Alternatives

With respect to alternative generation, I found that the presence of “token” alternatives diminishes efficiency and consensus. A token alternative is a proposal that draws a significant amount of discussion and analysis, but that is not ever seriously considered. A token alternative differs from a “straw man” in an important way. With a “straw man,” people understood that it would never be implemented. However, they realized the value of discussing it as a means of stimulating critical evaluation and debate. In the case of a token alternative, some individuals presented options that they never intended to consider seriously. For example, in the inefficient SOF Decision, advocates of one course of action presented a number of token alternatives:

“We did some internal analysis about who were the tool providers that we should team with. We had a chart that said what we ought to do is team with a tool provider. And we had a bunch of [alternatives] listed. And to be honest with you, between Bill and I – it was a kind of a half-assed attempt, because we knew we wanted to go with ZTech. But we were filling in the required work that said, would you go with Jet Corp.? No, why not? Would you go with Keytone Inc.? No, why not? Would you team with AFile? No, why not? So we had that list.”

This quote implies that managers felt compelled to offer multiple options to make the process appear thorough and analytical. However, others perceived these efforts as manipulative:

“I don’t think we looked at anybody seriously except for ZTech Corp.”

“This is pretty ordained from the first day. They knew they were going to do this and this six months of...this has just been goofing around.”

As Table 5 indicates, all of the high efficiency/high consensus groups managed to avoid token alternatives, while none of the low efficiency/low consensus groups achieved this feat.

Proposition #5: Managers achieve higher levels of efficiency and consensus when they avoid token alternatives during the decision-making process.

In general, token alternatives create the perception that others are not considering all opinions seriously, and that individuals may be engaging in self-serving behavior. They also may cause people to become disenchanted with *the entire process*. For these reasons, token alternatives have a negative effect on efficiency and consensus.

Advocacy and Analysis

These managers employed formal analysis regularly. In some cases, however, the primary evaluator or analyst also served as a strong advocate for a particular choice. The advocate employed formal analysis to justify a course of action, rather than to evaluate all options. These data suggest that efficiency and consensus suffer when advocates perform the evaluation. For example, in the ORG decision, one manager described his perception of an advocate's analysis:

“His conclusion at the end of this was more...it was tilted toward what he wanted to say. It was his briefing.”

Similarly, an Advanced Electronics executive described an advocate's attempts to filter information and dominate the evaluation process on the SOF Decision:

“As champion, he sold it. He sold the concept that we had to have an alliance or a partnership. Once the process started, it was relatively secretive. I knew it was going on. If I asked some pointed questions, I'd get some answers, but there were

no briefings, there was no discussion, there was no passing a document around for view, anything of that sort.”

By contrast, some groups of decision-makers separated advocacy from evaluation. They invited third parties to provide objective analysis. These third parties often consisted of the firm’s strategic planners, its financial analysts, or external consultants. An executive described the separation of advocacy from evaluation during the COM Decision:

“I think that I was the spokesman for this effort. I was its conduit to the staff... The Chief Financial Officer, obviously, his job was to see whether or not it made financial sense but I never gave him any data. Well we gave him a couple. I mean I could go back to my desk and we gave him projections, and he used to always have frustration with me that the projections weren’t very solid outside of three months from now. There was a curve and it went this way and he’d say, ‘Well, what underlies that?’ and I’d say, ‘I don’t know.’ I used to be embarrassed because I couldn’t provide an answer. We couldn’t figure it out and that’s when Dan decided he was going to bring in a management consulting firm.”

This evidence suggests that the use of formal analysis may not garner support for a proposal if others feel that a manager arrived at certain conclusions prior to performing the analysis. This may occur when strong advocates serve as the primary evaluators of the different alternatives. Table 5 indicates the number of cases in which groups separated advocacy and evaluation. The following proposition emerges from the evidence regarding advocacy.

Proposition #6: Managers achieve higher levels of efficiency and consensus when they separate advocacy from evaluation, i.e. when a strong advocate for a particular position does not provide the primary evaluation of alternatives.

When groups fail to separate advocacy from evaluation, they allow individuals to present only analysis that confirms their existing position, rather than a balanced assessment of all options. This inhibits the formation of common understanding. Moreover, it creates the perception that people's opinions are not being valued, and causes people to lose faith in the process. If people don't perceive the process to be genuine, they may withhold dissenting views, yet remain uncommitted to the decision (Janis, 1972). Individuals also may refuse to provide the resources needed to implement the decision (Ashforth & Gibbs, 1990).

In sum, groups cannot achieve efficiency and consensus simultaneously if people perceive that they have not had equal access to information, and that they have been presented with inauthentic alternatives and analysis. Groups must pay attention to how people perceive the behavior of those who present information, alternatives, and analysis during the process.

CONCEPTUAL FRAMEWORK

Scholars have described strategic decisions as complex, novel, open-ended, and ill-structured (Bower, 1998; Dean & Sharfman, 1996; Hickson, et al., 1986; Mintzberg, et al, 1976; Murnighan & Mowen, 2002; Schweiger, et al., 1986). Groups encounter two difficult challenges when they try to make these kinds of decisions. To reach closure, groups must overcome these obstacles, and ultimately agree on a choice that can be implemented effectively.

My findings suggest that the three groups of managers that achieved high levels of efficiency and consensus overcame two obstacles more effectively than the other groups. One obstacle is substantive, while other is symbolic in nature. First, complex tasks can overwhelm groups due to the cognitive limitations, or bounded rationality, of the decision makers (Simon, 1976; Weick, 1984). Thus, the substantive challenge is to make the choice more manageable. Second, while managers act in a boundedly rational manner, they often try to signal that they have employed a rational or comprehensive decision process. They hope to enhance the

legitimacy of the process through signals and symbols (Feldman & March, 1981). The challenge is to avoid the perception that advocates are engaging in certain behavior purely for symbolic reasons, without providing substantive contributions to the decision process (Ashforth & Gibbs, 1990). As Figure 2 shows, the more effective groups employed two types of processes that enabled them to cope effectively with the difficulties of making ill-structured decisions.

Insert Figure 2 about here

The more effective groups made the choice manageable by gradually structuring the unstructured task. In particular, these groups made a series of intermediate choices along a path toward sustainable closure. They first determined *how* they would make their decision rather than focusing almost entirely upon *what* course of action to take. They eliminated options as the process unfolded, and ultimately, made tentative choices contingent upon the occurrence of specific events. In sum, they treated closure as a *process rather than an event*. They did not seek closure in a single act of choice, but rather sought a series of “small wins” that built momentum toward a final decision (Weick, 1984).

The more effective groups also preserved the legitimacy of the decision-making process. As decision processes unfolded, these groups encouraged the gathering of extensive information, the generation of multiple alternatives, and the development of careful analysis. However, they discouraged the tendency to employ these practices for purely symbolic reasons. In the organizational sociology literature, procedural legitimacy refers to the perception that organizational techniques and processes are “desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions” (Suchman, 1995, p. 574). Feldman and March (1981) described the role of legitimacy in the decision process. They argued that rational decision-making methods have a symbolic as well as a substantive role in the decision-making process. In particular, these scholars noted that, “using information, asking

for information, and justifying decisions in terms of information have all come to be significant ways in which we symbolize that the process is legitimate” (Feldman and March, 1981, p. 178).

However, others have suggested that efforts to enhance legitimacy may be problematic (Ashforth & Gibbs, 1990). In some cases, constituents may perceive attempts to legitimate processes as “manipulative and illegitimate” (Ashforth and Gibbs, 1990, p. 177). Managers at this firm often gathered much data, considered multiple alternatives, and conducted formal analysis. These actions should symbolize intelligent and rational decision-making, and therefore bolster procedural legitimacy. However, I found that individuals *do not perceive* all data gathering, alternative generation, and formal analysis in the same manner. Interpersonal tensions arise if individuals perceive that they do not have a genuine opportunity to influence the final decision. Unequal access to information, token alternatives, and advocate-driven analysis actually de-legitimize a decision process, and decrease efficiency and consensus.

IMPLICATIONS

This study’s findings imply that the more effective groups treated closure as a process that began to unfold even during the early stages of a decision. When groups established evaluation criteria, they had begun to plant the seeds for a durable closure and a strong consensus. They formed an important foundation of agreement, and yet they continued to engage in dialogue and debate about many alternatives and assumptions. These groups did not treat closure as an event that occurred after a period of wide-ranging, creative, and open-ended brainstorming and debate. They made progress toward closure by periodically making choices about elements of the problem, even as they continued to debate their differences.

These findings provide new insights into how decision-makers employ simplification processes in order to solve complex problems. March and Simon (1958) argued that individuals and groups engaged in satisficing behavior, because people’s cognitive limitations precluded the

use of rational-comprehensive analysis for many decisions. Weick (1984) asserted that individuals and groups re-framed complex problems as “mere problems” in order to address the challenges of bounded rationality. This research indicates that groups may employ a different form of simplification behavior as a means of making complicated decisions. The effective groups in this firm employed a high level of comprehensive or formal analysis, and framed problems as large and urgent issues rather than as minor concerns. However, they simplified complex decisions by seeking convergence and closure in small steps, through a series of intermediate choices made at key points during the decision-making process. This simplification strategy enabled them to tackle complex, strategic decisions without sacrificing the comprehensiveness of their analysis and without minimizing the importance of the issue.

This study also makes an important contribution by further developing the concept of procedural legitimacy as it pertains to organizational decision-making processes. Feldman and March (1981) observed that “organizations systematically gather more information than they use, yet continue to ask for more” (Feldman & March, 1981, p. 171). They argued that firms employ information for its symbolic value, as well as for its effect on decision quality. In particular, gathering extensive amounts of information symbolizes that managers are engaging in a comprehensive decision-making process. Feldman and March (1981) suggest that social norms emphasize the merits of rational or comprehensive decision-making. Thus, gathering extensive information legitimizes a decision process. This research suggests that other actions also may symbolize rational or comprehensive choice, and thereby bolster procedural legitimacy. In particular, the utilization of formal analytical techniques and the generation of multiple options signify that managers are employing a thorough and logical decision process.

Feldman and March (1981) emphasized the positive benefits of symbolic action in the decision process. This study offers a different perspective, by suggesting that symbolic activity

may decrease procedural legitimacy. For example, individuals may present a list of alternatives for purely symbolic reasons, rather than because they wish to generate an authentic debate and consideration of those options. Others may perceive these options as “token alternatives”, and conclude that individuals are trying to manipulate the process. If so, these attempts to enhance procedural legitimacy will actually de-legitimize the process (Ashforth & Gibbs, 1990).

In sum, this research suggests that group members make critical attributions during decision-making processes. Individuals attribute motives to others’ actions (Jones & Pittman, 1982). They may perceive information gathering, alternative generation, and formal analysis as authentic efforts intended to enhance the quality of the decision. On the other hand, they may believe that others are trying to manipulate, “rig”, or pre-ordain the process. If group members perceive self-serving motives on the part of others, they may become disenchanted with the decision-making process. This hinders the group’s ability to achieve efficiency and consensus.

FUTURE DIRECTIONS

Future research can build upon the findings presented here by addressing certain limitations of this study. Future studies may also extend the framework developed in this research project, and explore some new questions that have emerged based upon this study.

Addressing Limitations

First and foremost, the data presented here suggests a series of propositions, but these hypotheses need to be tested systematically in future research. Scholars may choose to test these hypotheses through additional field research or through experimental studies. However, they need to be mindful of the differences between the laboratory setting and real organizations.

Second, though I took steps to avoid recollection biases, future studies might avoid this problem altogether by examining decisions in real-time. This represents a major challenge for researchers, because these processes unfold over long periods of time. In addition, the processes

do not occur within the confines of a series of senior team meetings. They comprise one-on-one and subgroup discussions involving people from different levels of the organization.

Finally, this research took place within a large organization operating in a rapidly consolidating, yet somewhat stable industry. Moreover, the company had a fairly analytical culture. These factors may limit the generalizability of the findings. Future studies could test whether these findings hold in entrepreneurial organizations operating in high velocity environments. For instance, one might expect that entrepreneurial firms must act so quickly that they cannot afford to develop a series of agreements over time. Therefore, entrepreneurial firms may employ other strategies for simplifying and structuring complex decisions.

Extensions of this Research

This research focused on how managers conducted decision processes after a problem came to people's attention, but did not explore how issues became part of the firm's strategic agenda in the first place. Future studies should pay more attention to how managers initially recognize and diagnose problems. Scholars should focus on how decision processes originate, and why managers choose to attend to certain issues and not others. In the individual decision-making literature, Klein (1998) has conducted some very insightful research on how fire commanders and naval officers make rapid decisions in the field. He described how they utilized their experience to recognize situations, compare them to analogous incidents, and diagnose the problem quickly. Little work has been done to understand similar processes within firms.

Second, I did not focus much attention on the leader of the decision-making process. Retrospective reporting limited the extent to which I could uncover details about how the leader managed discussions. However, some limited evidence suggested that the leader could occupy a very important role in shaping the context in which decision processes take place. For example, in the ALL decision, the chief executive designed a process for evaluating the alternatives. He

suggested the use of multiple subgroups, and assigned himself as the Devil's Advocate responsible for critiquing various proposals. However, he did not participate directly in many of the deliberations. Thus, he may have affected the outcome more significantly by shaping the context and designing the process than through substantive comments. Real-time studies may offer additional insights regarding how leaders can influence outcomes through process design.

Finally, a great deal of prior research has examined how managers can avoid faulty reasoning and enhance the quality of strategic choice (Bourgeois & Eisenhardt, 1988; Janis, 1972; Russo & Schoemaker, 2002). Future research must examine other decision outcomes and identify the tradeoffs that managers face among different objectives. Many scholars contend that managers must make painful tradeoffs among competing objectives such as decision quality, commitment, and efficiency (George, 1980; Janis, 1989). A few argue that effective managers must have the capability to overcome these tradeoffs. They call for studies of "how, if at all, process outcomes such as decision quality, speed, and implementation are simultaneously achievable" (Eisenhardt & Zbaracki, 1992, p. 34). This study begins to offer insight as to how managers avoid painful tradeoffs and accomplish these goals simultaneously.

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TABLE 1
Summary of Prior Research Findings

	Process Efficiency	Management Consensus
Participation and Involvement	Assertive leadership, consultation with a few trusted associates enhances efficiency.	Broader participation and less directive leadership enhances consensus.
Level of Conflict	Level of conflict either slows pace, or has no effect at all on decision-making efficiency.	Cognitive conflict has positive effect, while affective conflict has a negative effect.
Political Behavior	Politics takes time and effort, and therefore, decreases decision-making efficiency.	Support-generating political behavior builds consensus during the decision-making process.
Alternative Generation	Breadth-Not-Depth strategy enhances efficiency.	Breadth-Then-Depth strategy enhances consensus.
Formal Analysis	Real-time information fosters efficiency, while formal analysis and planning diminishes it.	Formal analysis, systems, and procedures can help to build management consensus.

TABLE 2
Situational Characteristic Survey

Variable Name	Variable Operationalization	Items in Scale	Eta Scores	Cronbach's Alpha
Threat/ Crisis	<p>Likert-type scales measured the extent to which the decision was:</p> <ul style="list-style-type: none"> • perceived as a crisis • required immediate action to address a highly critical problem • involved a threat of significant financial loss • presented the possibility of a large competitive setback 	4	0.33	0.77
Uncertainty	<p>Likert-type scales measured the extent to which there was:</p> <ul style="list-style-type: none"> • uncertainty regarding the specific course of action required • uncertainty regarding the information needed to make a decision 	2	0.22	0.75
Novelty	<p>Likert-type scales measured the extent to which the organization:</p> <ul style="list-style-type: none"> • had faced decisions concerning a similar issue • was familiar with this type of decision 	2	0.35	0.76
Time Pressure	<p>Likert-type scales measured the extent to which:</p> <ul style="list-style-type: none"> • the organization faced time pressure on this decision • anticipated an event in the near future that constrained the organization's timetable for making a decision • individuals faced time pressure during the decision-making process • individuals felt constrained by schedules and deadlines 	4	0.23	0.80

TABLE 3
Sample Profile

Name of Decision	Business Unit	Type of Decision	Description
ALL	Naval Warfare	Strategic Alliance	What firms should we form an alliance with in order to compete successfully on a major new U.S. Navy program?
MOD	Naval Warfare	Capital Investment	How should we modernize the shipyard facilities in order to enhance the efficiency of the ship assembly process?
LEV	Naval Warfare	Capability Development	How can we leverage the world class engineering capability throughout the corporation in order to improve ship design and engineering at the division?
CVP	Vehicle Systems	Strategic Alliance	What domestic and international firms should we team with in order to compete successfully on a new international combat vehicle program?
ENG	Vehicle Systems	Strategic Alliance	What firm should we team with in order to produce engines that are in high demand in international markets?
NEW	Vehicle Systems	New Business Entry	Should we enter a new segment of the combat vehicle market?
ORG	Vehicle Systems	Organization Design	What organizational structure should we employ to manage a newly acquired, highly entrepreneurial business?
COM	Advanced Electronics	Organization Design	How should we design an organization to commercialize a new technology created originally for defense applications?
RES	Advanced Electronics	Business Restructuring	How should we restructure the Advanced Electronics business in order to enhance profitability?
SOF	Advanced Electronics	Strategic Alliance	What firm should we team with to enhance our capability to develop and market a line of software products?

TABLE 4
Survey Instruments

Variable Name	Variable Operationalization	Source of Measures	Items in Scale	Eta Scores	Cronbach's Alpha
Decision Understanding	Survey defined six categories of concerns that may have influenced the decision. Respondents allocated 20 points among the categories, using the point allocation to indicate the relative importance of the different concerns.	Adapted technique employed by Bourgeois, (1980) Amason (1996); Dess (1987); Wooldridge & Floyd (1990)	6	N/A	N/A
Commitment	Survey included questions that assessed whether people were "willing to see that the decision was properly implemented" and had "personally argued in favor of the alternative that became the final decision."	Utilized instrument developed by Amason (1996), based upon work by Wooldridge & Floyd (1990).	6	0.37	0.90
Efficiency	Survey assessed the utilization of process iterations such as when managers "reconsider or reevaluate different options" or "revise the goals and objectives" as well as the use of resources such as "senior management time and effort" and "middle manager time and effort."	Developed instrument based upon concepts introduced by Mintzberg, et al. (1976), Janis (1972); Harrison (1999); Trull (1967).	10	0.22	0.81

TABLE 5

Summary of Qualitative Data in Support of Six Major Propositions

	High Efficiency/ High Consensus	Low Efficiency/ Low Consensus	High Efficiency/ Low Consensus	Low Efficiency/ High Consensus
Well-Defined Evaluation Criteria	3 of 3	0 of 3	2 of 2	1 of 2
Winnowing Process	2 of 3	0 of 3	1 of 2	2 of 2
Real Option/ Contingency Approach	2 of 3	0 of 3	1 of 2	1 of 2
Equal Access to Information	3 of 3	1 of 3	1 of 2	1 of 2
Avoidance of Token Alternatives	3 of 3	0 of 3	1 of 2	0 of 2
Separation of Advocacy from Evaluation	2 of 3	0 of 3	1 of 2	1 of 2

TABLE 6
 Proposition Data for Each Decision

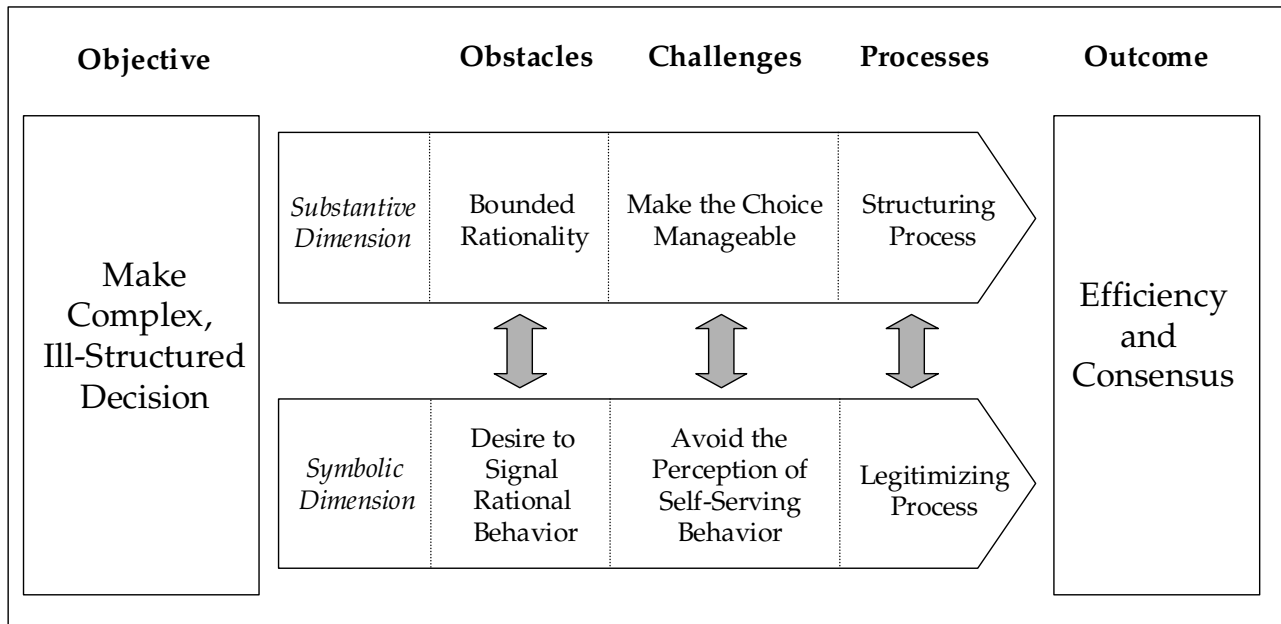
	Well-Defined Criteria	Winnowing Process	Real Option/Contingency Approach	Equal Access to Information	Avoidance of Token Alternatives	Separation of Advocacy & Evaluation
ALL	Yes	Yes	Yes	Yes	Yes	Yes
LEV	No	No	No	No	No	No
MOD	Yes	Yes	Yes	No	No	Yes
CVP	Yes	Yes	Yes	Yes	Yes	No
ENG	Yes	Yes	Yes	No	No	Yes
NEW	Yes	No	No	Yes	Yes	No
ORG	No	No	No	Yes	No	No
COM	Yes	No	No	Yes	Yes	Yes
RES	No	No	No	No	No	No
SOF	No	Yes	No	Yes	No	No

FIGURE 1
Decision Categorization¹

		Col. Mean = -0.82	Col. Mean = +0.78		
Consensus	High	MOD SOF <hr/> E = -0.20 <hr/> C = +21.54	CVP ALL COM <hr/> E = +0.98 <hr/> C = +22.13	Row Mean = +21.90	
	Low	RES LEV ORG <hr/> E = -1.24 <hr/> C = +7.42	NEW ENG <hr/> E = +0.48 <hr/> C = +17.37	Row Mean = +11.40	
		Low	High	Efficiency	

¹ The efficiency measure is a z score (mean=0, standard deviation=1). The consensus measure is a multiplicative function of the scores for commitment and understanding, and ranges from 6.54 to 26.15. Efficiency and consensus are not highly correlated (Spearman correlation equals 0.28). T tests indicate that the differences between the row and column means are statistically significant at the 0.05 level.

FIGURE 2
Conceptual Framework



Biographical Information

Michael A. Roberto is an Assistant Professor of Business Administration at Harvard Business School. His primary research interests include strategic decision-making processes, top management team dynamics, and conflict management.