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STRATEGY DESIGN, PROCESS AND IMPLEMENTATION IN AN UNSTABLE/COMPLEX ENVIRONMENT: A SECOND EXPLORATORY STUDY

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ABSTRACT

The decision making practices and organizational structure of student teams were examined within a playing environment that was unstable and complex. Although differing degrees of firm development and learning were exhibited, the more successful firms reached early agreement on both their goals and the means by which their goals should be pursued. It appears that student teams make their strategic decisions in a manner which is similar to that employed by real world strategic decision makers.

INTRODUCTION

This is a second paper that reports on a series of studies designed to explore the decision making practices of teams within a business simulation context. These studies have three general, long term purposes. The first purpose is to explore the internal decision making world of simulation teams to better understand how these teams develop and function. The second purpose is to ascertain the conformity between the decision making procedures employed by simulation teams versus those procedures used by real world decision makers. The third purpose is to discover the relative effectiveness *of* various strategic decision making practices given a variety of external organizational environments. The first study in the series by Gosenpud and Wolfe (1988) explored the strategic decision making process in a stable/complex environment while the present study explores the strategic decision making process in an unstable/complex environment

This research series emerged from an uncertainty about whether the decision making practices employed by business game players closely approximated those practices employed by real world decision makers. This question is of relevance to both those who wish to teach the art and science of administrative decision making as well as to those who wish to use simulations for organizational research. In establishing the conceptual foundation for these studies, an environmental contingency view was adopted. This view emerges from the literature dealing with the appropriate match between strategic decision making practices and outcomes and the relative degree of complexity and uncertainty manifesting itself in the external environments faced by organizations (Aldrich, 1979; Dill, 1958; Duncan, 1972; Emery and Trist, 1965; Thompson, 1967).

The schema by Duncan (1972) states that an organization's environment possesses two relevant dimensions-the environment's degree of complexity and its rate of change. Given the particular degree of complexity and change rate found in the organization's environment different organizational forms and format interrelationships are necessary. With respect to actual decision making practices, Thompson (1967) has stated the organization's decision makers face two basic decision issues what goals or ends the firm should pursue and what causal linkages or means exist with which to pursue those goals. Again, a contingency view is taken where the appropriate decision making method, leadership style, and organizational evaluation criteria Is dependent upon the degree of agreement existing regarding the firm's goals and the means for accomplishing its goals. Meising and Wolfe (1985) have combined the Duncan and Thompson schemas into a matrix structure that highlights the appropriate planning and decision making stance which should be adopted by the organization given its particular environmental situation. This matrix provided the theory base for this series of studies and served to generate the propositions put forth in this paper.

RESEARCH QUESTIONS

In the first of the present series of studies, the environment was stable and the simulation's causal linkages were relatively unknown to the players early in the simulation. This would place the firm's decision makers in Quadrant 2 or the northeast corner of the matrix presented in Figure 1. Accordingly, a consensual, intuitive planning and decision making style would be the most appropriate style at the beginning of the simulation. In this situation the organization's leader should be an arbitrator and a collegial style should be encouraged and supported by the organization. In the present study the environment was destabilized and causal linkages were still unknown early in the game. Figures 2 and 3 display the growth elements posed between the two studies conducted thus far in the series. The present growth environment, combined with wide standard deviations around the growth trends (Tosi, Aldag and Storey, 1973) would put teams into Quadrant 4 at the beginning of the simulation. In this situation a conceptual, inspirational planning decision making style would be appropriate. Additionally, the organization's structure should be organic and it should be governed by a charismatic leader.

This matrix position suggests three propositions regarding the propriety of a student team's strategic decision making processes as well as the elements within those processes given the organization's external environment.

P1   The successful firm's knowledge of its causal linkages moves from the unknown to the known over the course of a simulation's run.

P2   The successful firm's degree of agreement regarding its goals should move from the unknown to the known over the course of a simulation's run.

P3   The successful firm must correctly interpret the amount of environmental change it faces.

P4   Successful firms initially adopt a Quadrant 3 orientation within the matrix and gravitate to a Quadrant 4 orientation by the end of the simulation.

At this stage of our exploratory studies into game related decision making environments, we will tentatively conclude that an environment created by a simulation is valid and potentially useful for business

Figure 1

Planning Systems Based on Causal
Linkages and Environmental Change

Known ◄─────────────── Causal Linkages ─────────► Unknown
(Synoptic Orientation)   (Behavioral Orientation)

Planning Style: Computational Decision Making: Analytical Leadership: Authoritarian Organization: Mechanistic Strategy: Proactive Success: Unity of purpose; min- imal interaction; efficiency QUADRANT 1	Planning Style: Consensual Decision Making: Intuitive Leadership: Arbitrator Organization: Collegial Strategy: Judgemental Success: Best estimates; de- mocracy; cohesion and cooperation QUADRANT 2
QUADRANT 3 Planning Style: Contingency Decision Making: Incremental Leadership: Statesman Organization: Matrix Strategy: Interactive Success: Environmental scanning; close internal communi- cations; tight control	QUADRANT 4 Planning Style: Conceptualized Decision Making: Inspired Leadership: Charismatic Organization: Organic Strategy: Creative Success: Exploit opportunities; thrive on ambiguity and complexity; innovative "gestalt" thinking

Left axis (top to bottom): Stable (Programmatic Orientation) — Environmental Change — Dynamic (Incremental Orientation)

Figure 2

Forecastable Base Demand by Country: First Study

Base Unit Sales (000) vs. Year (1984 – 1992)

United States ─────────
Switzerland ── ── ── ──
Japan ───── · ─────·
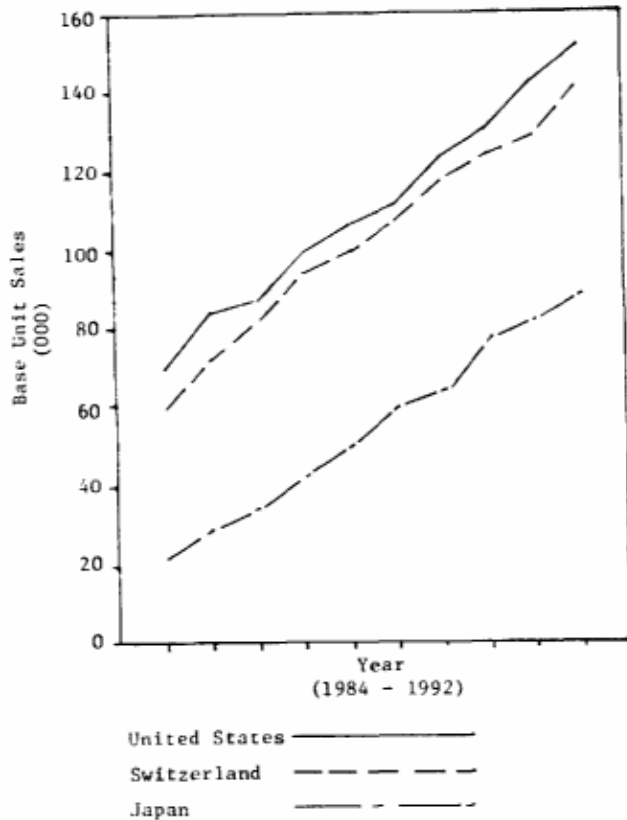
Figure 3

Forecastable Base Demand by Country: Second Study
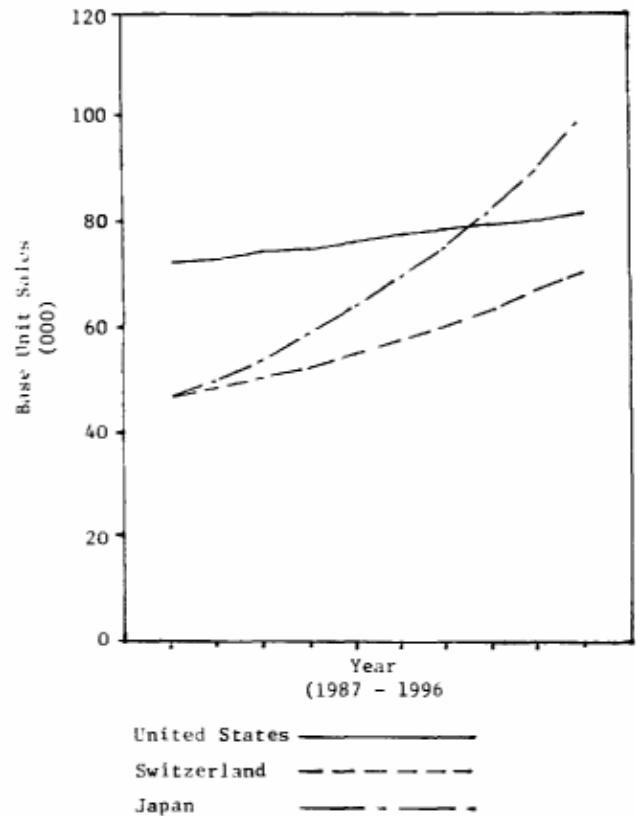
Base Unit Sales (000) vs. Year (1987 – 1996)

United States ─────────
Switzerland ── ── ── ──
Japan ───── · ─────·

policy research and pedagogical applications if the (1) proposed strategic decision making behavior is evidenced, and (2) proposed suitable behavior and team structure is rewarded with successful organizational performance.

METHODOLOGY

Twenty-three masters students in an end-program strategic management course were placed on six randomly assigned teams. All but two students were enrolled part-time and one was an international student. The teams played for nine decision rounds with the first eight rounds considered *for* performance and grading purposes in Rinton and Smith's (1985) Strat-Plan for 55.0% grade credit. Team success was determined by the weighted average of the following criteria:

Cumulative profits	50.0%
Mean rate-of-return on investment	30.0%
Shareholder wealth (Net present value)	20.0%

Strat-Plan was employed in this study because of the flexibility it offers the game administrator in selecting various levels of game complexity and environmental rates of change. The scenario chosen created a multinational environment (United States, Switzerland, and Japan) that was simultaneously complex and dynamic. As established in the game's parameters, two products could be sold in each country through branch offices via salesreps. Operating scales were initially different by country, monetary exchange rates fluctuated each decision round, and manpower and production costs were differentiated given both monetary fluctuations and relatively different labor and capital productivities. In addition to these complexities, the amount of dynamism or fluctuating growth posed within each country was also different in conformance with the concept of environmental turbulence as defined by Bourgeois (1985), Dess and Beard (1984), Duncan(1972), Ireland, Hitt, Bettis and DePorras (1987), and Tosi, Aldag and Storey (1973). Although forecasting errors ranging from 2.0% to 5.0% would be experienced in practice, a Strat-Plan team could have created a graph such as that presented in Figure 3 from data supplied by the Game Administrator. The graph would show that initial demand in Switzerland and Japan was equal yet inferior to the demand available in the United States. As the simulation progressed, Switzerland's basic demand would rise at a fairly steady rate while the demand in the United States would rise at a lesser and more unstable rate. Japan's rate of growth would accelerate and by 1994 would be greater than total demand realized in the United States.

In-depth within team group interviews were conducted at the semester's end. Each team was questioned as to its grand strategy, self assessed success with its strategy, how and why the strategy changed if such was the case, the team's structure and how and why the structure changed if it was altered, the degree of role specialization employed, team formality, and expressed leadership style. Transcripts were made of each team interview and independent content analyses were conducted on the transcripts to determine the answers to the above research questions. A high degree of interrater content agreement was attained. An additional set of assessments was made by the junior author as to the appropriateness of each team's strategy, whether the terms used by the team to describe its strategy were true descriptions of strategic content, whether teams accepted the success criteria posed by the simulation, and whether teams understood its strategic imperatives. Peer evaluations, which effected 18.0% of each player's final course grade, were also collected. These evaluations took the form of stock bonuses and were gathered as an additional measure of each management team's cohesiveness.

RESULTS

Tables 1 and 2 present the quantitative results obtained in this study. Table 1 shows that Firms 5 and 6 obtained the industry's highest economic performance while Firms 1 and 2 were the lowest performing companies. Table 2 finds that stock bonuses were fairly evenly divided for four companies; the stock bonus for the poorest performing firm was the most uneven. The following material summarizes the by-firm findings obtained from the qualitative content analysis of each interview transcript.

Table 1

Final Ranked Standings

Firm	Rank
1	5
2	6
3	3
4	4
5	1
6	2

Table 2

Stock Bonus Standard Deviations

Firm	Standard Deviation
1	0.0000
2	0.3077
3	0.0333
4	0.0000
5	0.0110
6	0.0000

FIRM 1

This company adopted very conservative and financially oriented goals for itself. The company also inhibited its growth potential by attempting to finance its opera I ions from retained earnings without increasing its number of outstanding shares. Late in the simulation the company changed its financially-biased strategy to one that was marketing-biased. This was done by dropping prices and thereby doubling sales.

In two respects, this team was not in touch with the game's reality. First, it felt it was more important to conform to its own values of financial conservatism rather than attend to the gross, profit oriented criteria established by the game administrator. In this sense, they redefined the game's success criteria. Second, this team ignored the real growth possessed by the market, following instead their independently derived pregame forecasts of 1.0% to 3.O% growth per year. This team never mentioned a grand strategy such Growth, Stability, or Retrenchment. Whatever its objectives, a strategy of Growth was probably most likely to succeed in this simulation.

The firm initially adopted a functional structure without a president or overall director for the firm. One team member handled marketing, one dealt with finance, and another person scheduled production. Late in the game one person began to take on more of the team's overall operations.

The company operated in a fairly informal fashion throughout most of the game although its meeting dates and times were scheduled in advance. The team also had an agenda for its meetings and the players became more formalized near the end of the simulation as the team proceeded through its meetings the same way each time. The team's leadership style was collegial and the players enjoyed one another's company. There were no apparent changes in roles (other than the overall operations change noted above), procedural climate, or leadership style.

FIRM 2

The initial strategy employed by this company entailed the sale of high quality products at higher than normal prices with relatively little plant expansion. Later in the game the firm cut its prices (without the benefit of having obtained lower per unit costs) as it found itself with high finished goods inventories. Still later, the firm's strategy was one of low prices and lower quality products although the interviewees appeared to be divided on this point.

This team was more in touch with the game's reality than was Team 1. They knew they were unsuccessful and did not try to redefine the game's success criteria. They stated they now knew how to attain success, but these statements lacked a realistic grasp of the simulation's strategic imperatives. Their descriptions included a few strategic statements such as "expanding slowly," but these were intertwined with specific, tactical suggestions.

The firm did not appear to be too sure of its structure. Apparently, each member tried to be involved in each geographic market and all functional areas. Firm 2 may have also flirted with a functional structure for one quarter but they disagreed on whether they actually attempted this. Whatever was attempted, the effort was abortive as no role assignments were ever made.

Firm 2 employed an informal meeting structure but it felt they slid into a rut by discussing generalities rather than the specifics of its worksheets. Thus there is the suggestion that the team became less routinized over time. No particular agenda was created or followed as the firm never stated what was to be accomplished at each meeting. Conference times and dates were never set. Most team members felt their company's leadership style was democratic because everybody participated unless someone had worked particularly hard on a certain game aspect and therefore had earned the right to dominate that topic area. The team agreed, however, that they were leaderless.

FIRM 3

This company adopted a very aggressive marketing stance in all geographic areas. It employed price cuts and high advertising expenditures with the goal being increased market share. The firm was successful with this marketing strategy as it always dominated its markets. Their strategy began to change a bit later as their initial lead in bottom line profits began to diminish Firm S ultimately passed them in the final standings. The company discovered they had failed to expand their plant capacity enough to sustain their growth in sales they also had skimped on their Research and Development budget to their long term disadvantage. The team described its actions in strategic terms (aggressive, cost cutting), its strategy of growth was at least partially appropriate, and the team knew the essentials for success in an after-the-fact fashion.

Firm 3 adopted a functional structure without a president although one person seemed to coordinate many of the firm's aspects through the use of a personally-designed spreadsheet program. Additionally, a degree of overlap was employed for each functional area. Those areas were marketing and production with finance thrown in as an emerging afterthought. All personnel maintained the same general functions through the game. There were clear roles and these roles were sometimes defined by very specific activities such as one individual evaluating per unit costs. These roles changed only as members discovered which

tasks demanded more or less effort. The company's climate was jovial and informal although an agenda was followed during their meetings. They started their sessions with the marketing function and went through each geographic area's prices and production levels. Near the middle of the game their focus changed somewhat to production concerns and the team became more informal in their interrelationships. The company met every Saturday at 9:00 a.m.

FIRM 4

This team's original strategy was to be a high volume firm via low prices and low manufacturing costs although it quickly violated one aspect of this strategy by raising its prices after one decision round. After two very difficult years featuring numerous strategic changes the firm felt it was always playing catchup. They surmised their initial strategy would have been correct if they had only "stayed the course" rather than engaging in a series of self-defeating strategic modifications.

Firm 4 changed its success criteria to one of not losing money and the increase in profits whenever they were obtained. The terms this team used to describe their actions were decision specific rather than strategic because tactical price changes were so central to their operating method. They tried to lower costs and raise volume but these actions were not as salient in their verbalizations as were their pricing decisions Their initial strategy was more or less appropriate (they understood that cost reduction was important) and they had a vague understanding of what it would take to win the simulation.

Regarding the firm's structure, the team laughingly said it had three presidents. They all worked together in a leaderless fashion with relatively little conflict. No labor specialization was employed although specialization was attempted for the first decision round. The team met twice a week and its meetings were fairly unstructured for many weeks. At about the simulation's midpoint they began to become aware of the environment within which they were competing and therefore became more structured in their approach. The firm's decision making climate was informal but with a rough agenda. Leadership patterns, the level of task specialization, and the team's ambience remained the same over time.

FIRM 5

This firm was very resolved and dedicated to its initial strategy low prices and low costs to obtain a large market share. The firm established for itself the maximization of profits as their ultimate criterion as that outcome had the highest grading weight for the simulation. Accordingly they wholeheartedly accepted the simulation's success criteria. A key to their strategy's success was the long term use of research and development outlays. Near the end of the game the firm began to emphasize marketing a bit more as it realized it could no longer increase its profits through cost reductions.

The team's strategy was appropriate, well integrated, and perfectly implemented. The company knew what was important and it stuck to its plans. They felt none of the formal organization structures described in the Player's Manual were descriptive of theirs everybody did their homework and contributed to the meeting in a collegial fashion. Each team member initially volunteered to cover a certain functional area and each continued in that selected area after the second or third week of play. This structure remained the same

on a weekly basis with the firm's climate being one of consensual informality with an agenda.

FIRM 6

This company initially wanted low unit costs, a differentiated product, and sales in all market areas with relatively high prices. Later the firm set middle-of-the-road prices and they felt this worked better for them. The company also issued very little stock and made all its plant investments early in the simulation.

The firm was somewhat undecided as to the success of their strategy but they changed it because it was not producing the profits they desired. Additionally, although the firm wanted to pursue an average price strategy, after the simulation's midpoint it found itself with the industry's highest prices. The team's strategy of low per unit costs was at least partially correct and it belatedly knew what it took to create a winning company. The team also appeared to accept the game administrator's definition of successful play and therefore was able to more efficiently address the endstates rewarded by the experience.

The company's structure was "kind of functional." Decision making was by consensus with no divisions of labor or role specializations. The firm tried specialization but felt the degree of integration required by the game frustrated clear demarcations between the players. Neither the structure or role patterns changed over time. Regarding the firm's decision making climate, the players said they "informally did the same thing every week" within a collegial leadership style.

DISCUSSION

One of the purposes of this study was to ascertain the degree that decision making procedures within business game teams emulates such procedures within teams of real world decision makers. In this study, as in its predecessor, teams demonstrated that their strategic decision making practices were just as disjointed, messy, and circuitous as those decision making practices exhibited in real world contexts (Cohen, March and Olsen, 1972; Janis and Mann, 1977; Linblom, 1959; Massolini, 1984; Mintzberg, Raisinghani and Theoret, *1916;* Quinn, 1978). Additionally, just as ineffective real world decision makers ignore important and relevant environmental signals and attend instead to a delimited and internally created vision of the world (Andrews, 1987; Drucker, 1974), this study's poorest performing company was more interested in conforming to its own environmentally inappropriate values rather than attending to either the success criteria established by the game administrator or to the market trends provided in the game's start-up materials. In total, two of the three poorest performing companies formulated their own success criteria rather than accepting the game's objective criteria.

Past research on the effects of a vacillating strategy within a business game context has found that strategic constancy and the accommodation of adversity are strategic management skills (Dutton and Stumpf, 1988; Stumpf, 1988a; Stumpf, 1988b) and that the lack of these skills is associated with poor firm performance (Gosenpud, Meising and Milton, 1984; Remus, 1983; Wolfe, 1976). Successful firms quickly realize and implement a winning strategy while unsuccessful firms either implement an incorrect strategy and are forced to change their strategy midstream, or are wavering in their dedication to the strategy they have adopted. In this study, two of the three poorest performing teams constantly shifted strategy during major portions of the game. Alternatively, two of the three top performers maintained the same strategy throughout the simulation, and the other top performing team changed its strategy early enough to realize the benefits of the change.

In the real world, decision makers also do not always fully understand the consequences of their decisions (Cohen, March and Olsen, 1972; Yavitz and Newman, 1982). Mirroring this real world phenomenon, one of the more successful teams admitted that it had little understanding of the full impact of one of its most success-enhancing decisions.

To a great degree the teams in this study behaved as predicted by the Miesing and Wolfe model. To all teams the game presented novel and confusing stimuli in its introductory phases. Causal linkages were also unknown. According to the model, firms operating under the provided scenario would initially find themselves in a Quadrant 4 situation where the firm's external environment is dynamic and its internal environment presents unknown causal linkages. At this stage of the firm's development it should employ a conceptualized planning style and it should engage in inspirational decision making. The firm must be innovative in the market place as the external environment is a known factor but it faces the challenge of making order out of the internal chaos that initially presents itself. The ultimately successful firm should eventually know all its causal linkages and therefore moves to a Quadrant 3 condition. This fully-realized firm can then adopt a contingency planning style in combination with an incremental decision making mode.

In this study the successful teams moved from a behavioral orientation to a synoptic orientation as predicted by the model. The top three companies, Teams 3, 5, and 6, all became environmental adapters. The central strategy for each firm was more or less appropriate but each adjusted to early misestimates or to the continuously changing environmental conditions they experienced. Team 3 underestimated the appropriate expansion levels and eventually adjusted. Team 5 increased its marketing effort as cost reductions became increasingly expensive while Team 6 lowered its prices to remain competitive.

The poorer performing teams never developed beyond the behavioral mode. The strategy for Team 1 was largely imaginary whereas the structures for Teams 2 and 4 were either unclear or organic . The Meising and Wolfe model also predicted close internal communication and tight control for successful teams in -the synoptic, incremental quadrant. From the interviews it again appears that successful teams behaved in the proposed fashion. Members of the top four teams met often, and the teams either had overlapping roles, a loose but interactive structure, or became increasingly structured over the game's duration.

Combining the results of both studies in this series, it is clear that discernible organizational learning and development takes place within simulation teams. Virtually all teams sought and gradually gained consistency and efficiency so they would not have to recreate a new decision making process for each decision round. Most teams followed routines, if even merely the slavish adherence to the outline provided by the software's spreadsheets. Most firms developed strategies or identifiable guidelines for their decisions which helped to reduce the complexity and time involved for each decision round (Andrews, *1981).* Some of the strategies were not always appropriate and in fact some were counter productive. However such guidelines were almost always present. Additionally, most teams sought

pride. Winning teams were able to utilize their superior performance to gain and maintain esteem. Losing teams needed other ego defense mechanisms. The substitution of self-created success criteria for those criteria presented by the game were most likely defensive measures for those who performed poorly. Finally, teams sought, and for the most part, developed cohesion. Success in turn enhanced cohesion which made the simulated company an entity worthy of dedication and effort.

From both studies a pattern for winning teams appears to emerge. As indicated in Table 3, members of two of the top three teams in the present study and both top teams in the first study took on identifiable coordinating roles that were not necessarily related to specific functions embedded in the firm's simulated structure. Such role formation did not appear to take place for the less effective companies. In addition, two of the top four teams in the present study and all three top three teams in the previous study became more clearly organized over time. For two of these five teams, roles became more rigorously defined in practice and somewhat less expansive over time. For two teams, routines became more crystallized with time, and for one team, responsibilities shifted to be both consistent with member motivation and in a fashion that was clear to all team members.

REFERENCES

References will be supplied by the senior author:

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Table 3

Selected Characteristics o High and
Low Performing Firms Across Studies

Team Characteristic	Presence	Absence
Identifiable Roles	Study 1: lop two teams	Study 1: Third and last ranked teams
	Study 2: First and Third ranked teams	Study 2: Third, Fourth, Fifth and Sixth ranked teams
Increasing Formalization	Study 1: Top three teams	Study 1: Last ranked team
	Study 2: First and fourth ranked teams	Study 2: Second, Third, Fifth and last ranked teams

CONCLUSION

The present series of studies is exploratory and the methodology which treats teams as cases and utilizes in depth interviews for data gathering has yet to be perfected. This approach to the study of simulation team decision making behavior, however, has produced discernible results. It yields information that is rich, reflective of team development, and it has detected parallels with decision making practices in the real world.

Clear differences between the behavior of high and low performing companies can be identified in terms of team organization and the way they engaged in strategic management. It is also clear that simulation teams act similarly to real world decision making teams in that they sought efficiency, consistency and intramember closeness. They also attempt to maintain esteem in the face of disconfirming results.