

Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

A LIFE CYCLE ANALYSIS OF DECISION MAKING FOR A STRATEGIC MANAGEMENT TEAM

Jerry Gosenpud, University of Wisconsin-Whitewater
Joseph Wolfe, University of Tulsa

ABSTRACT

This study intensively analyzed the life cycle of a team consisting of graduate students playing a management simulation. The data gathering was undertaken by audiotape of ten of the team's meetings, and content analysis of 193 pages of transcripts was performed to interpret the data. Three stages of development occurred. In the first, the team organized, oriented itself, set goals and attempted to understand the simulation parameters. In the second, the team analyzed, prioritized and coordinated goals. In the third, this team analyzed little and became very routinized.

INTRODUCTION

Life cycle theories have been observed and created to explain how organizations develop over time and how their strategic survival needs change over that cycle (Bernstein and Berbaum, 1983; Kormanski, 1988; Lippitt and Schmidt, 1967; Quinn and Cameron, 1983; Poole, 1983; Scott, 1973; Thain, 1969). Theories of this type have also been used to diagnose and resolve the various issues which must be correctly dealt with by a growing firm if it is to continue a healthy and profitable existence (Greiner, 1972). Just as life cycle analyses have been created for real world organizations, life or developmental cycles have also been found for newly-formed task and decision making groups, as well as for learning and developmental groups (Bases and Stradtbeck, 1951; Bennis and Shepard, 1956; Bettenhausen and Murnighan, 1985; Caple, 1978; Fisher, 1970; Hare, 1976; Mabry, 1975; Obert, 1979; Parsons, Bales and Shils, 1953; Tuckman, 1965; Tuckman and Jensen, 1977).

In a larger sense student teams created for play in large-scale, computer-based management games are essentially learning groups (Lakin, 1972) which must quickly socialize themselves, set agendas, create decision making task structures, and learn to respond to the simulation's macroeconomic and microeconomic environments in the correct fashion if optimal learning and economic performance is to be obtained. Because of business gaming's time compression feature these tasks must be accomplished correctly over a relatively short time period. Accordingly, a life cycle analysis of a simulation-based firm may be an appropriate method for (1) obtaining a better understanding of how student teams operate, and (2) determining the developmental issues that present themselves during each phase or stage of the team's evolutionary sequence. In a pedagogical or course application vein, knowledge of this kind can be used by the instructor to enhance a student's learning experience by forewarning the instructor as to the nature of the developmental dilemmas that will be faced by the typical player. With this warning the instructor can either enhance the learning results obtained from a gaming experience in either a proactive, intervening fashion, or in a reactive, game debriefing fashion.

As part of a long term series of studies which are attempting to capture the complexities and dynamics of the strategic decision making process, this study's initial purpose was to determine if a student team's decision making processes were tractable. If such was the case a more rigorous analysis

of the functional and dysfunctional attributes of their processes can be conducted thus enabling the guidance of students towards more productive business gaming experiences.

LITERATURE REVIEW

A relatively sparse literature is available to guide those who wish to capture the nature of the decision-making processes and life course of teams in business games. Although a number of studies employing life cycle analyses have been cited, those studies are descriptive of a firm's entire life cycle from birth to eventual decline and death. Because of the fashion in which business games are used for pedagogical purposes those studies are not particularly relevant for two basic reasons. In a typical management game students are placed on existing firms which are already past at least their initial birth stage and the game's parameters are often set to simulate industrial conditions associated with the late growth stage of an oligopolistic industry's life cycle. Additionally, real world firms slowly enculturate their new members through training orientation, and reward and punishment systems while a business game company receives an instantaneous infusion of new and naive management talent while simultaneously experiencing the mass exodus of its prior management team. Accordingly, although the firm itself may have gone through its birth and growth stages the new student team has not gone through those stages with the company from its inception. Because of these features the most relevant research comes from the small group, group decision making, and organizational learning literature.

In a summary fashion the small group literature finds that; a group's development proceeds rapidly at first and that much structuring and organizing may occur within the first few minutes of interaction. Much of the group's early development deals with the establishment of its social structure--the formation of status and role relations norms, and power relationships.

For example in the small group decision making or problem solving literature Fisher (1970) found that task oriented groups pass through four phases:

1. Orientation phase--Group members search tentatively for ideas and direction relative to the task at hand.
2. Conflict phase--Disagreement breaks out, as members become more definite in their opinions. Attitudes become polarized and statements become more precise and less ambiguous.
3. Emergence phase--Conflict and argument dissipates and ambiguity reoccurs as a form of modified dissent.
4. Reinforcement phase--Members move towards closure by avoiding dissent and constantly reinforcing the emerging decision, which is about to be finalized.

While the small group and decision making group liter-

Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

ature is of general applicability, the most relevant study has been conducted by Cangelosi and Dill (1965) as part of their work on a theory of organizational learning. A seven-person team of MBA students playing The Carnegie Tech Game (Cohen, Dill, Kuehn and Winters, 1964) for fifteen weeks was tape recorded and observed. As a result of their observations the authors divided game play into four phases based on the attributes of the game situation and the actions of the players:

1. Initial phase- Because of their lack of experience with the game the players adopted a "wait-and-see" attitude while making relatively tactical type decisions. This period lasted for the game's first three rounds.
2. Searching phase-Team members began to make strategic, longer-term decisions while exhibiting a high degree of experimental interest. They looked for historical patterns in the start-up data they had received and debated decision alternatives. The organization's structure changed as they attempted to solve problems produced from the results they had obtained from the first three decision rounds. Although they increased the amount of time spent on the game it was difficult for them to feel any sense of accomplishment.
3. Comprehending phase-This phase was characterized by more rapid and positive learning. The players began to use concepts from prior course work in economics, marketing, statistics and operations research. The firm was rewarded with increased profits.
4. Consolidating phase-As the simulation was about to end the firm began to routinized its actions and decisions while opting to consolidate its position rather than experimenting with new ventures cover all functional areas as well as inquiring the integration of those functions for overall

corporate effectiveness.

In addition to the observation of four developmental phases, Cangelosi and Dill also noted changes in the team's goal and organization structure, the bases for its decisions, and the decision-making processes employed. Table 1 outlines how these areas changed over the course of the company's life course. Generally stated the company moved from organizational randomness to order and from interpersonal disarray to cohesion and integration.

METHODOLOGY

The Simulation Experience

This was a free simulation study (Chanin and Shapiro, 1985) using randomly assigned teams of end term MBA students as its subjects. Most players held full-time positions and had reached the upper-lower to lower-middle management levels in their real-world business firms. The simulation ranked at the most complex end of the Wolfe (1978) game complexity scale and required over 110 explicit decisions per decision round. An earlier critical incident study using a simpler version of this study's simulation found students paralleled the playing and decision making behaviors exhibited by real-world middle management executives in the same exercise (Wolfe, 1976).

Players were assigned to 4 or 5-member teams, which inherited firms in a simulated oligopolistic market. Each firm was a manufacturing conglomerate operating two strategic business units (SBUs). One SBU operated in the Housewares Industry and manufactured stainless steel flatware and pots and pans. The other SBU operated in the Wheelgoods Industry and manufactured children's strollers and car seats. Because of the game's complexity each team's decisions could

TABLE 1
COMPANY CHANGES BY DEVELOPMENTAL PHASE

Company Change	Initial Phase	Searching Phase	Comprehending Phase	Consolidating Phase
Goal Structure	Ambivalent about setting objectives; lack knowledge about viable goals; goals lack operational specificity	General objective becomes clear; functional areas began to set goals for themselves; functional goals not integrated into a comprehensive whole	Objectives become centralized and unified although not all members accept the newer orientation	Short term and long term goals integrated and are specific; overall goal of profits becomes the driving force for all decisions
Bases for Decision	Little concern for key variables; gross efforts at trying to understand how variables interacted; much emphasis on competitors' actions but not their reactions	Concerted attempt to find key variables; a finer grain analysis of submarkets and forecasting techniques; first decision support routines created	Attempts to measure the relative importance of key variables; variable manipulation strategies discussed; player programs reduce the amount of routine analysis required	Many new approaches to decisions discussed; statistical and Markovian models applied
Decision Making Processes	Short run decisions heavily dependent on intuition and judgment; group defers to one highly respected individual	Others contribute to the decision making process; decision making rationales are offered; long run strategy not considered and the previously respective "intuitive" manager loses a degree of influence	More objective analyses employed although failures caused firm to re-employ subjective techniques; operational philosophies began to appear; long term strategies get attention	Very specific marketing policies adopted
Company Structure	Organized along functional lines with informal reporting relationships	Firm reorganized with a market/product emphasis	Same structure continues	Structure changed again with product managers given full authority with an operations person acting in a staff capacity

Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

All teams were given two years (8 quarters) worth of past operating reports, decision logs, industry performance information, and the names and telephone numbers of their company's previous board of directors. As part of a pregame orientation experience all companies had to prepare and present a strategic audit of their firm's start-up condition with an accompanying plan of action. The entire exercise lasted 2½ simulated years (10 decision rounds) for 50Z grade credit.

Data Gathering

Ten sessions of one simulation team's decision making sessions were audiotaped and transcribed by a research assistant who had been assigned to the firm for the study's purposes. These ten sessions covered approximately the first half of the team's existence.¹ Although not present during the decision sessions, the assistant assured continuity over the game's decision making sessions by insuring the recordings were made regardless of where the meetings were held. One hundred and ninety three pages of transcripts were produced and these were content analyzed by the senior author. The team was comprised of five players -Wayne a full time accountant working for a major oil firm sixty miles from the university's campus, Katie R. and Kevin R., two full time students, and Patti F. and Kim K., two part time students holding respective lower middle management positions in the state's largest bank and another major oil company. All members were expected to attend the pregame sessions although Patti F. was absent once. The firm chose a decentralized product organization structure. Patti F. and Kim K. were in charge of the Housewares Division, Katie R. and Kevin R. were in charge of the Wheelgoods Division, and Wayne M. was designated President. His task was to act in a consolidating and intermediary role. Of the ten-recorded sessions six were held before the game began while the remaining four took place within the two SBUs created by the simulation. By the end of the simulation this management team took their first place team to third place in a four company industry.

RESULTS AND ANALYSIS

The audiotaping method used in this study generated a large amount of rich data. The content analysis found six streams which were more or less present within the company being studied. Those streams were:

1. Information search and data bases
2. Analyses and analytical techniques
3. Decision content and structure
4. Organization structure and managerial roles
5. Status hierarchy
6. Discussion focus

Information Search, Analyses, and Decision Content

Information search. Information sources included historical computer output, reports from previous simulation players, especially those who did well, the game manual, the instructor, theory from present or past courses, and the decisions made by other teams. For the most part information was obtained to provide data for a subsequent analysis, but it was also obtained to understand the game's basic operations.

Analyses. Analyses were either performed for their own sake, to help write the strategic audit, or to make specific decisions. These analyses varied in their complexity. They could be complex either because they employed multiple kinds of information (historical trends plus competitor data plus formulae), because they emerged from multiple elements of similar data (many different formulae), because they involved many calculations, or because they resulted in complex decisions. Analyses also varied in sophistication. The most sophisticated analyses utilized theory-derived formulas.

Decision content and structure. In addition to making the specific decisions required for the decision form, the team made decisions on how to organize, when to meet, how to meet deadlines, and how to do their strategic audit. Decision making could vary depending on how much discussion and conflict preceded the decision, the degree to which complex analyses were employed (the team often performed a complex analysis but ignored the analytical results when making its decision), the time lapse between analysis and/or discussion and decision making (sometimes decision making immediately followed analysis or discussion while at other times a lengthy lag occurred), and the degrees to which (1) decisions flowed from strategies or at least from preset priorities, (2) goals were set, (3) alternatives were presented and long term consequences were anticipated, and (4) decisions were experiments, highly detailed, or influenced by emotional factors.

Organization Structure and Managerial Roles

The team appeared to organize itself differently for three different activities. It organized for simulation play, for strategic audit writing, and for its weekly SBU group meetings. In some ways these structures overlapped while in other ways they did not. For example Wayne M. was the team's consolidating individual (the highest authority role) for simulation decisions and he also coordinated the audit itself. But Kim K. and Katie R. coordinated the audit writing process. For formal simulation decision making purposes the team organized on the basis of geographic convenience rather than upon any felt need emanating from the game itself. Wayne M. was given a non-SBU position in part because he lived far away and serving as an intermediary did not require a constant physical presence. Katie R. and Kevin R. worked on the same SBU because they were full time students and were on campus every day while the other SBU was staffed by Patti F. and Kim K. who were part time students living near each other.

One difference between the audit writing and simulation decision structures was the energy spent in coordinating activities. For the audit, much time was spent making the parts of it fit together and making sure there was enough slack available to adjust the report into a coherent whole. Presumably this was done in part because of the clear relationship between a coordinated audit and a high grade on the audit. Additionally, the team was initially enthusiastic and it knew how to coordinate reports. For weekly decision making, however, less energy was spent on coordinating activities, perceptions, and strategies. No overall strategic guidelines were employed to tie the SBUs into a meaningful whole, and to the degree that coordination was undertaken, it was done after action.

To a large degree, unilateral actions prevailed over coordinated actions. Many of the players' strategic intention statements began with the phrase "I want to" as opposed to "I think we should." Within the SBU which was studied intensively, all analyses were done independently by one member. Even with regard to re-

¹ An explanation appears in the last column of Table 2.

Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

port writing, this team's most coordinated project, specific assignments were never made. The initial work on the audit was done by Patti F. who was absent from a crucial planning meeting but wrote her analysis in isolation. The group then wrote the rest of its report using her analysis as a prototype.

Organization took place for two other purposes- to do different types of work, and to discuss and decide important issues. Regarding work, Patti F. and Kevin R. were analyzers, Wayne M. interpreted and applied information from the manual, and Katie R. was a seeker of expert information while also copying a number of documents. The discussion/decision making roles followed those described by Benne and Sheats (1948), but we found more of them, including those of the challenger, topic shifter, expert, approver, external standards monitor, self discloser, worrier and teacher.

Status Hierarchy

Within the status hierarchy found within this firm, Wayne M. gained stature early through his executive experience in financial analysis. Patti F. was also very influential through the possession of an attractive demeanor and through her initiating activities. Wayne M.'s expertise had greater value to the group, however, and he was deferred to and was eventually asked to be the company's president. Interestingly this offer was made by Patti F. who always maintained an avid interest in influencing her team. Overall it was clear that status went to those who contributed. Wayne M. had the most expertise and possessed the most thorough intellectual understanding of the player's manual and the games complexity. Patti F. seemed to exert the greatest effort, performed the most analyses, constantly made suggestions, and produced the prototype for the strategic audit.

Patti F. and Wayne M. possessed the greatest stature. They were the only ones who consistently challenged others, were the only ones to argue over strategy, and the only ones who taught the others within the experiential situation. They were

also more likely to make unchallenged statements, were more likely to influence the direction of the conversation, and were slower to back off from the positions they took.

Discussion Focus

The discussion focus of the first two meetings varied considerably from minute to minute, with most of the time spent on how to seek information, what kind to seek, and how to organize. In the next meeting, the team focused on analysis plus the content and organization of the audit-less time was spent on information seeking. During these initial meetings, many topics were covered, with a short amount of time spent on one topic and different team members discussing different topics at the same time. During the simulation's middle period conversational foci lasted longer and this appeared to be a function of the amount of preparation and sophistication possessed by the players. In meetings 4 and 5, when the participants were Patti F. and Kim K. (and Wayne M. in meeting 5) conversations about one topic lasted a relatively long time. For the most part, these discussions were analytical and if the participants needed a long time to solve a problem they gave themselves this luxury. They were able to do this because Patti F., Kim K. and Wayne M. were prepared and sophisticated enough to focus on an intensive analysis. In contrast, in the last part of meeting 5 the relative preparation/sophistication levels of the participants (Katie R., Kevin R., Wayne M.) were unequal and the conversation duration was shorter. This unfocused pattern continued in meeting 6 when all but Patti F. participated. By this time Kevin R. was prepared, so Kim K., Kevin R. and Wayne M. were now relatively even in their sophistication but conversational focus was still short and not always on analysis because Katie R., the least sophisticated member, often changed the focus away from analysis. Thus the focus was longer when the preparation/sophistication level of the group was more equal and the focus was more likely to be analytical when all were sufficiently prepared.

TABLE 2
FIRM ACTIONS AND DECISIONS BY MAJOR TIME PERIOD

PERIOD 1 (Meetings 1-2)	PERIOD 2 (Meetings 3-6)	PERIOD 3 (Meetings 7-10)
Players unprepared and information obtained from instructor and previous players. Analysis and data gathering done for the sake of learning. Analysis simplistic and available information overwhelms the team. Team tries to orient itself by learning what to avoid, how to win, and how difficult the experience was going to be. Decisions revolve around team structure and various game-related deadlines. Team obtains harmonious relations by dividing itself into three unconnected units. Conversational and decision making focus scattered and curt.	Purposes of analyses and data gathering becomes more concrete. Team begins to focus on specific phenomena and analyses become more complex and sophisticated. Information base comes from team-generated formulae and game printouts. First strategies formulated and priorities assigned to different functional areas within the firm. Conflict results in creative solutions. A high level of enthusiasm grips the firm as jokes and compliments are exchanged. Wheelgoods Division falls behind the Housewares Division in the preparation of its sections of the strategic audit. Housewares Division generates specific goals for itself while the firm's president must explain the player's manual to the Wheelgoods Division's personnel. Housewares personnel very supportive of each other. Conversational and decision making focus very extended.	Decision making routinized while rigor of decision making processes deteriorates; previously created historical trends, strategies and formulae rarely utilized. Wheelgoods Division personnel very discouraged with results. Mistakes that are discovered are not corrected and new information not utilized. Conversational focus remains constant although the amount of analysis declines. Routinized, nonanalytical character of meetings continues until the game's end. (Meetings past #10 not audio taped, however.)

Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

CONCLUSION

This study sought to capture decision making in its rawest form. The results which emerged were rich and comprehensible and suggested promise for a continuation of the research method. Table 2 displays the major observations that can be made about the team over the course of the sessions which were recorded. Any conclusions drawn from this study, however, must be tempered by the fact that the datum was based on only one decision making team under a circumstance of relative organizational failure.

This study's decision making team exhibited organizational life cycle development. The first two time periods (see Table 2) roughly corresponded to Cangelosi and Dill's first three developmental phases (see Table 1). In this study, time period one consisted of orientation, organization, general goal setting, and attempts to understand behaviors similar to those in Cangelosi and Dill's Initial phase. Period two included Concrete and sophisticated analyses, prioritizing and coordinating goals, and variable manipulation-behaviors indicative of Cangelosi and Dill's Searching and Comprehending phases.

Behavior during the third time period was consolidating, but was different in some respects from that of Cangelosi and Dill's team. In the present study norms and decision making became routinized without the introduction of new ideas, while Cangelosi and Dill's team integrated goals, established policies, and experimented with new approaches. Yet both teams consolidated, became more orderly, and routinized.

Cangelosi and Dill's 1965 discussion of reactions to stress may help explain the differences in team behaviors between the two studies. According to these authors stress is caused by simulation complexities and Outcomes failing to meet individual expectations. Individual and organizational learning occurred as a result of the stress and it was learning which eventually resulted in growth and consolidation. For this study's team, the response to the stress was ordering but also avoidance. The consolidation occurred but without the learning.

It should be noted that data was available for only approximately half of this study's team's existence. Thus treating this team as if it had proceeded through a full life cycle can be questioned. This team, however, clearly demonstrated consolidating behaviors. Furthermore, Wolfe and Jackson (1985) found that many growthful consolidating behaviors such as strategy formulation appear relatively early in a simulation team's existence. Therefore, the behavior in this study may have covered all phases of a simulation team's life cycle. Even if incomplete, this team showed tractable, cyclical development. From confusion, it oriented and organized itself, it learned and gained in comprehension and skill, and eventually it became more established and routinized.

This study also generated results about a facet of the decision making process rarely discussed in the literature. The results of this study suggest that preparation level equality affects the decision making process. Equal levels of preparation beyond a necessary minimum appeared to make for greater harmony, less change in focus during discussions, and more penetrating analyses. Status gains also accompanied increased preparation levels.

This study's results also shed light on how conflict,

long considered functional by management scholars, aids decision making effectiveness. In this study, conflict and challenge forced discussion, thereby helping to make decisions more explicit. Conversely, decisions were rarely discussed or made explicit when conflict challenges were absent. Finally, this study made an observation that violates the common wisdom that low status members do not initiate. In this study low status members initiated discussions around the issues of group maintenance and organization. Although perhaps these issues were of little interest to other team members, low status members still initiated.

REFERENCES

- Bales R.F., & Strodtbeck, F.L. (1951). Phases in-group problem solving. Journal of Abnormal and Social Psychology, 46, 486-495.
- Benne, K., & Sheats, P. (1948). Functional roles of group members. Journal of Social Issues, 4, 41-49.
- Bennis, W.G., & Shepard, H.A. (1956). A theory of group development. Human Relations, 9, 415-437.
- Bernstein, E. & Berbaum, M.L. (1983). Stages of group decision making: the decomposition of historical narratives. Political Psychology, 4, 531-561.
- Bettenhausen, K. & Murnighan, J.K. (1985). The emergence of norms in competitive decision making groups. Administrative Science Quarterly, 30, 350-372.
- Cangelosi, V.E., & Dill, W.R. (1965). Organizational learning: observations towards a theory. Administrative Science Quarterly, 10, 175-203.
- Caple, R.B. (1978). The sequential stages of group development. Small Group Behavior, 9, 470-476.
- Chanin, M.N. & Shapiro, H.J. (1985). Dialectical inquiry in strategy planning: extending the boundaries. Academy of Management Review, 10, 663-675.
- Cohen, K.J., Dill, W.R., Kuehn, A.A., & Winters, P.R. (1964). The Carnegie Tech Management Game: An Experiment in Business Education. Homewood IL: Irwin.
- Fisher, B.A. (1970). Decision emergence: phases in-group decision-making. Speech Monographs, 37, 53-66.
- Follett, M.P. (1940). Constructive conflict. In H.C. Metcalf & L.W. Urwick (Eds.), Dynamic Administration. NY: Harper and Row, 30-31.
- Greiner, L. (1972). Evolution and revolution as organizations grow. Harvard Business Review, 50, 37-46.
- Hare, A.P. (1976). Handbook of Small Group Research. NY: Free Press.
- Kormanski, C. (1988). Using group development theory in business and industry. Journal for Specialists in Group Work, 13, 30-43.
- Lakin, M. (1972). Experiential Groups: The Uses of Interpersonal Encounter, Psychotherapy Groups, and Sensitivity Training. Morristown, NJ: General Learning Press.
- Mabry, E.A. (1975). Sequential structure of interaction in encounter groups. Human Communication Research, 1, 302-307.

Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

- Obert, S.L. (1979). The Development of Organizational Task Groups. Unpublished doctoral dissertation. Case Western Reserve University.
- Parsons, T., Bales, R.F. & Shils, E.A. (1953). Working Papers in the Theory of Action. Glencoe, IL: Free Press.
- Poole, M.S. (1983). Decision making development in small groups II: a study of multiple sequences in decision making. Communications Monographs, 50, 206-232.
- Quinn, R.E., & Cameron, K. (1983). Organizational life cycles and shifting criteria of effectiveness. Management Science, 29, 33-51.
- Schweiger, D.M. (1980). The Impact of Cognitive Styles on Strategy Formulation Effectiveness in Uncertain Environments. Unpublished doctoral dissertation, University of Maryland, College Park, MD.
- Thain, D.H. (1969). Stages of corporate development. Business Quarterly, 34, 35.
- Tuckman, B.W. (1965). Developmental sequence in small groups. Psychological Bulletin, 63, 384-399.
- Tuckman, B.W. & Jensen, M.C. (1977). Stages of small-group development revisited. Group & Organization Studies, 2, 419-427.
- Wolfe, J. (1976). Correlates and measures of the external validity of computer-based business policy decision-making environments. Simulation & Games, 7, 411-438.
- Wolfe, J. (1978). The effects of game complexity on the acquisition of business policy knowledge. Decision Sciences, 9, 143-155.
- Wolfe, J., & Jackson, C. (1984). The accuracy of participant recall for creating models of the strategic management process. Paper presented, Academy of Management, San Diego, August 1985.