

# Developments in Business Simulation & Experiential Exercises, Volume 23, 1996

## LONG LIVE THE PLAN-OR SHOULD IT? EXAMINING THE IMPACT OF DETAILED STRATEGIC PLANS ON ORGANIZATIONAL PERFORMANCE

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### ABSTRACT

Prior literature has examined the impact of strategic planning on organizational performance. The results have been equivocal. This study attempts to address this issue. It also examines the impact of changing plans, in response to negative feedback, on performance. The findings suggest that detailed strategic planning, as prescribed by the strategic management literature, may actually hinder organizational performance in a dynamic decision situation. Furthermore, frequent changes in strategic plans may also hinder performance.

### INTRODUCTION

The strategic management literature prescribes that decision-makers should select goals and strategic targets for the organization (Porter, 1980). Once the goals are identified, it is recommended that strategic managers create a number of scenarios, which describe different means to achieve the objective under different circumstances (Thompson and Strickland, 1994). The decision-makers are then expected to implement the scenario that best fits with the organization's current external and internal environment.

A number of studies have examined the relationship between planning and firm performance in a business simulation game. Dickinson and Faria (1994) compared the performance of undergraduate student teams on a marketing simulation to that of an organization run on the basis of decisions made using random criteria. Student teams performed significantly better than the random criteria firm. The authors concluded that student teams did better because they made their decisions based upon some degree of formal planning and feedback on performance. From this study, it is clear that some sort of planning is needed.

Other studies have explicitly examined the impact of formal planning on team performance in total enterprise simulations. Hornaday and Curran (1988) and Curran and Hornaday (1987) asked undergraduates to play the Business Management Laboratory Game (BML) (Jensen and Cherrington, 1984) for fourteen quarters. Prior to playing the

game, two sections of classes, in each study, were asked to submit detailed formal plans which included income statements and cash flow statements. The researchers examined the performance of the two groups.

Curran and Hornaday (1987) found no significant differences between the performance of planners and the nonplanners. However, Hornaday and Curran (1988) did find that planners had significantly better earnings, earnings per share, return on investment and stock prices than did the non-planners. Hornaday and Curran concluded that the contradictory results of the two studies were a result of the changes the administrators made in the second study to the market parameters to adjust for the number of teams within a particular industry. This was the primary difference between the two studies. Based upon these results, the researchers surmised that when times are bad (i.e., a weak economic environment), formal planning is less effective in increasing performance. However, in better times, formal planning has greater impact on performance.

Curran and Hornaday (1989) tested this hypothesis by having 46 3-member teams of undergraduates in 5 sections of business policy play 10 sets of decisions for the BML game. Two sections were required to turn in formal strategic plans while three were not required to do so. The administrators inserted three environmental conditions into the game process to introduce conditions of uncertainty. The first was the information that a war was occurring in the region from which firms procured their raw materials. Second, the labor contract was expiring. Third was a lobbying effort by a political action group to have the government force a decrease of emissions from the game's manufacturing plants. Each one of these threats could create additional costs for the firms. The results of the study found that the performance of the planning teams was significantly better than the non-planning teams.

Smith and Golden (1989), who also examined the impact of formal planning on organizational

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performance, did not find strong support for the relationship. They had 30 3-member teams of undergraduates in 5 sections of business policy play 9 to 11 periods of the AIRLINE simulation. The researchers allowed the groups to determine the extent of formal planning they were to submit as part of their simulation assignment. The authors then judged the extent of planning by scoring the written plans on the basis of plan quality, competitive tactics and plan rigor. The researchers report that the teams that had a plan only did somewhat better than those who did not have a plan, or as extensive a plan. Interestingly, plan quality did not have a significant relationship with quantitative finish. Qualitative performance was scored on the ability to match all ingredients of a good niche, proper cash management and a proactive management of the firm and the team's implementation of a monitoring and feedback system. There was a strong positive correlation between quality of plan and qualitative performance. This is not surprising since the evaluation of the plan and evaluation of qualitative performance tapped many of the same dimensions.

The contradictory results of Hornaday and Curran and the equivocal support found by Smith and Golden suggest that there needs to be further examination of the relationship between formal strategic planning and organizational performance, particularly in volatile or complex environments. The current study is an attempt to examine the relationship of strategic planning and performance over a long time frame in a complex environment.

The preceding literature review suggests the first hypothesis of interest to this empirical investigation:

H1: In complex or volatile long-term situations, as the extent of formal planning increases, organizational performance will increase.

The second stage of the strategic decision making process specifies that decision-makers should revise their strategic plans if they get negative performance feedback (Hill and Jones, 1995). As noted by Weiner (1979), most decision-makers usually do not implement any decision change unless faced with negative feedback. Decision-makers resort to routine behaviors to save on cognitive effort (Abelson and Levi, 1985). These routine behaviors are continued until the decision-maker experiences negative feedback. At that time, the decision-maker is expected to discard the current solution and implement a new one (Steinbruner, 1974). As

soon as the decision maker gathers negative feedback on environmental variables, a change in the decision process should be made (Lenz and Engledow, 1986). Furthermore, it is recommended that policy plans should be continuously revised and updated on the basis of performance feedback (Thompson and Strickland, 1994).

Several empirical studies have provided evidence that decision-makers' may not make adjustments to their decisions when faced with negative performance feedback. For example, Staw (1976) and Staw and Fox (1977) found that subjects would not make decision solution changes even when faced with negative feedback. In another study, some subjects changed decision policies with positive feedback and not with negative feedback while for others the opposite held true (Moch and Malik, 1987).

Another problem with this particular prescription of the strategic management literature is that frequent decision changes, in response to negative feedback, may not lead to optimal outcomes. Some negative feedback, during times of environmental uncertainty, may reflect random fluctuations in outcomes and, therefore, the decision-makers should not make any changes in response to the feedback. In other instances, negative performance feedback may require an adjustment in the decision solution being implemented; not a change in the entire strategic plan. Some researchers have suggested that it is possible that the level of negative feedback needs to reach a reference level before the decision maker should respond with changes to the strategic plan (Powers, 1973). This implies that decision-makers should not implement changes in their overall strategies each time they receive negative information.

While the issue of strategic change in response to negative feedback has not been explicitly addressed in the simulation literature, there are a few relevant studies. Remus (1983) had 107 business policy undergraduates, individually, play 9 periods of the Executive Game. He found that erratic decision making was negatively related to firm performance. Those firms that rapidly decreased erratic decision-making had higher performance levels. In addition, those firms that followed an overall, global strategy did better than those firms that had no strategy or switched from strategy to strategy. Similarly, two studies by Wolfe and Gosenpud (1989) and Gosenpud and Wolfe (1988) found that firms which switched strategies frequently did not perform as

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well as those firms which were able to quickly formulate and implement an overall strategy and goals.

These studies suggest the following hypothesis:

H2: In complex or volatile situations, as the frequency of changes in strategic plans increases, organizational performance will decrease.

### THE STUDY

The Subjects Sixty-one graduate students, enrolled in the M.B.A. program, at a large Midwestern university completed the computer simulation as part of their requirement for their Business Policy and Strategy course. Each student signed a consent form indicating his/her willingness to participate in the research.

The PLC Model Subjects were taught a variant of a Product Life Cycle (PLC) model (Hofer, 1975), one which posits that industry life cycles go through introduction, growth, maturity, and decline stages but that these stages do not necessarily follow in sequence and that stages can be repeated during the course of an industry's life (Porter, 1980). The students were taught how to make a variety of resource allocation decisions at different stages in the industry's life cycle. The prescriptions are summarized in Fig. 1.

Subjects were told that a critical indicator of the PLC stage is the pattern of the industry (as opposed to the company) sales. An upward slope indicated growth. A flat slope indicated maturity. And, a downward slope indicated decline. Subjects were warned, however, that industry sales fluctuate over time and that part of this fluctuation is random. Another part is due to the effects of the previous level of sales (the auto correlation component, Box and Jenkins, 1970). The effect of the stage in an industry life cycle on sales at any given point in time, therefore, is only one of three factors. Informed decision makers must either attempt to sort them Out or find decision rules or heuristics which constrain against over or under responding to temporary yet patterned fluctuations around the actual sales value determined by the stage of the industry.

Subjects also were told that resource allocation decisions must anticipate industry sales slopes. If a decision-maker allocated resources only after the sales slope has been identified, it would take time for these allocations to be converted to usable resources. Together, with the necessity of sorting out random and auto correlation effects on industry sales, the time lag estimation made the subjects' task quite realistic.

FIGURE 1

Prescriptions for How Each of the PLC Decisions Should be Made  
Decision Resource Allocation Prescriptions

	Intro/Growth	Maturity	Decline
1. Price	High	Med Low	Med
2. Accounting Ctrl	Low	High	Med
3. Quality Ctrl	Low	High	Med
4. Production Design	Med Low	High	Low
5. Plant & Equip	Med Low	High	Low
6. Distribution System	High	Med Low	Med
7. Market Research	High	Med	Low
8. Advertising	Low	High	Low
9. Research & Develop	High	Med	Low

The Simulation Subjects were required to apply their knowledge of the PLC model by making each of the 9 decisions in Fig.1 at each of 94 points in time. The game was played individually. The senior author developed a computer simulation, which was specifically designed to

represent the theoretical PLC model (Moch, 1987). The computer simulation was programmed to calculate the results for sales and net income and graphically present these data to the subjects. The sales results were based upon the PLC model the subjects had been taught. There were variations programmed into the simulation to

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reflect the actual fluctuations industries experience during a given stage. Those making decisions according to the model could get as much as 20x industry average sales. Net income was calculated by multiplying price x sales minus the money allocated. After each set of decisions, the computer displayed an industry average sales curve (industry sales vs. time, consistent across all subjects), a net income curve (varying by student), and gross income curve (varying by student). Subjects were then asked to make the 9 decisions again for the next business period (quarter). This procedure was repeated 94 times. Subjects actually participated in 100 business quarters, but graphic data displayed for 94 quarters. It took 6 quarters to generate interpretable curves.

The Measures. The measure of decision-making effectiveness was net income. This is a face-valid measure, because the simulation was programmed to generate high sales figures as a function of the extent to which subjects made decisions in conformity to the PLC model they had been taught. Since the study was designed to assess the impact of detailed strategic planning rather than content knowledge on decision making effectiveness, it was necessary to control for the extent to which student had learned the PLC model. Accordingly, subjects were given a 20-item multiple-choice exam prior to simulation play (PRE).

Subjects were to develop a plan for allocating resources during the periods the industry remained in each stage of the PLC, based upon theoretical assumptions relevant to that particular stage. During the lecture on PLC principles, subjects were informed that firms required different strategies in different stages of the model. They also were told that strategic principles suggest that they reassess these assumptions at each decision point and respecify their plan when it needed revision.

The extent to which students developed a detailed plan before starting the simulation was obtained from a self-report item after the simulation had been completed. On the basis of a 5 point Likert-type scale, each student responded to a the question, "I prepared a strategy for each phase before beginning the simulation" (PREP). "I changed my strategy whenever I made changes in my allocations" (CHANG) was used to measure whether subjects revised

their strategic plans each time they made changes in their decisions. They were also asked to record their response to the question I followed my initial strategy throughout the simulation (INIT). This tapped the extent to which subjects felt that their initial strategy was correct and did not require revision.

Operationally, therefore, it was expected that:

H1 (Operationalized): Subjects will have higher net income to the extent they stated they had prepared a strategy for each phase before beginning the simulation.

H2 (Operationalized): Subjects will have lower net income to the extent they changed their strategy whenever they made changes in their allocations.

### RESULTS

Subjects' net income (INC) was significantly correlated with other measures of classroom performance. As this is one of the traditional methods used to examine the internal validity of simulations (Dickinson and Faria, 1994), these results lend some support for the simulation's internal validity. These correlations are reported in Table 1. Questions comprising the PLC knowledge measure also were asked after the simulation was completed (POST). The difference between pre- and post-test scores was significantly different from zero ( $p < .05$ ), suggesting that the simulation appeared to have enhanced PLC learning. These associations are interesting in their own right. We report them here, however, only as indicators of criterion validity.

Correlations among the dependent and independent variables are presented in Table 2. Subjects' net income was positively associated with pre-test scores. There was also a positive correlation between net income and the extent to which subjects reported they followed their initial strategy throughout the simulation. The negative associations between net income and the extent to which subjects prepared strategic plans for each phase before beginning the simulation were not anticipated. The negative relationship between the extent to which subjects said they changed their strategy whenever they altered their decisions was expected. Only the correlation between net income and INIT was statistically significant.

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TABLE 1

Correlations Among Performance Indicators

	Net Income For Simulation
Midterm examination (objective multiple choice exam given before simulation)	.54*
Final Examination (objective multiple choice exam given after simulation)	.37*

\*p<.05

TABLE 3

Registration of Subjects' Net Income on Predictors  
PRE, PREP, CHANG, and Init

INDEPENDENT VARIABLES	T VALUE
PRE	1.805
PREP	-2.386*
CHANG	-2.094*
INIT	3.520-
Intercept	-0.127
R2	0.29**

\* (p<.05)

\*\* (p<.001)

TABLE 2

Correlation Among the measures Used in the  
Study

	PRE*	PREP*	CHANG*	INIT*
PREP*	.11			
CHANG*	-.23	-.08		
INIT*	-.01	.15	.06	
INC*	.23	-.17	-.24	.34 +

+ (P<.05)

\*PRE-pretest

PREP-"I prepared a strategy for each phase before beginning the simulation."

CHANG-"I changed my strategy whenever I made changes in my allocations/"

INIT-"I followed my initial strategy throughout the simulation."

INC-net income

The results of the correlation analysis were surprising given the empirical findings of previous studies. In order to do a more rigorous test of the relationship between the independent and dependent variables, we analyzed the data using multiple regression.

The data in Table 3 support the findings of the correlational analysis. These results do not support H1. In this study, subjects who detailed strategic plans for each phase of the simulation before beginning the game did not do as well as those who did not make detailed plans. The regression results do provide support for H2. Those who altered their strategy whenever they changed their pattern of decision making actually did worse than those who used other decision rules.

The absence of a statistically significant effect for the extent to which subjects had learned the PLC model on net income is not surprising. A number of other researchers have not found a relationship between learning and performance in simulations (eg, Whiteley and Faria, 1989; Washbush and Gosenpud, 1994).

## DISCUSSION

At first glance, it appears that the results of this study contradict the findings of previous research investigations of the relationship between formal planning and organizational performance. Upon closer examination, this is not exactly the case. In terms of formal planning, the results of this study suggest that it is not how detailed the strategic plans are that is as important for organizational performance as is the adherence to an overall strategy. These results are in line with the findings of Smith and Golden (1989) who reported that the quality of the plan was not related to performance but having a plan was. The findings of this study would suggest that detailed strategic plans may actually hinder performance.

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The current investigation also found that subjects who tended to stay with their initial strategies did better than those who changed their strategies every time they made changes in their decisions. Some of this relationship can be explained by the fact that some subjects would stay with their initial strategy because it was demonstrably effective. However, the simulation was programmed, in the short-run, to deviate from the model the subjects had been told governed it. Subjects with viable initial strategies, therefore, would have had to stick with them through several periods of short-term negative feedback in order to realize their potential. The quality of the initial strategy is only one component explaining the relationship between staying with a strategy and decision process which leads subjects to maintain their initial strategies despite short-term negative feedback. The other component is that adhering to an initial strategy results in a rapid decrease in erratic decision making. Those who changed their strategic plans whenever they changed their decision patterns due to negative feedback performed poorly. These findings lend further support to the results of previous research, which found support for the effectiveness of a consistency decision rule.

These two findings raise an compelling question:

Why does adherence to an initial strategy lead to better performance while specifying a detailed strategic plan lead to poorer performance? A reason for this phenomenon may be found in the decision making research. It has long been argued that humans are bound in their capacity to be rational due to cognitive limits (Simon, 1945; Lindbloom, 1959 and Williamson, 1975). For this reason, humans are not able to process all relevant environmental information. People use previously developed information processing patterns of schemata to help limit extensive cognitive effort in a decision making situation (Neisser, 1976; Markus, 1977; Weick, 1979). These schemata guide attention to particular information in the environment (Gioia and Poole, 1984).

In much the same way, people may use detailed strategic management policy plans as decision-making schema. This reliance upon a detailed strategic plan may actually result in constraining the decision-makers' attention to information in the environment pertinent only to that plan. Reliance upon a pre-specified detailed strategic plan is likely to be less effective when the organization is operating in a dynamic, complex environment that requires continual monitoring and change in decisions because important information may be ignored.

On the other hand, having an overall strategy provides the decision-maker with a framework for interpreting the decision situation. Decision-makers may make changes in their decisions to account for environmental changes without changing their framing of the decision situation, i.e., their strategy. Having an overview of their strategic direction is likely to decrease erratic decision-making and, thereby, increase performance.

This study attempted to examine the relationship between formal planning and organizational performance in a complex, volatile environment over a long timeframe. The results reported here should be replicated with another sample. The measures of the extent to which subjects employed the two strategic prescriptions were self-report measures. Future studies should look at the extent of formal planning and adherence to initial strategy by examining actual decision patterns and plans.

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