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ONE STEP BEYOND NAIVETE: LABORATORY SIMULATION OF STRATEGIC MANAGEMENT

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ABSTRACT

A predictive model of organizational success was created by using data from a survey of chief executive officers and from the results of a computer-assisted business simulation. Input from the survey was synthesized into a management orientation variable, and the outcome of the simulation provided an organizational strategy variable. The model's ability to predict organizational success was significant, and was improved by combining the two independent variables into a single predictor. The combined use of data from field studies and laboratory simulations is suggested for exploratory research in strategic management.

INTRODUCTION

More than a decade ago, Glueck [2] proposed laboratory simulation as a basis for fundamental research in the field of business policy. Seven years later, when Schendel and Hofer [8] assembled a collection of invited papers and critiques on the subject, "business policy" had generally given way to "strategic management" as the collective term for the activities of top management in organizations, and a significant amount of research had been undertaken. The use of simulation as a research method was not apparent in this collection, however.

Despite this slow start, recent years have seen increased interest in the use of simulation in strategic management research. Richman and Coleman [7] suggested simulation as a method for duplicating, synthesizing, or predicting important factors in actual organizations at relatively low cost. Furthermore~ they argued, simulation permits alternatives to be tested, and detailed monitoring of such tests may help identify the best course of action for a particular situation.

Schwenk [9] provided support for Glueck's proposal by identifying laboratory research as the appropriate approach in the early stages of a discipline's life cycle. While experiments cannot replace field research, they can help define relationships among important variables, assist in avoiding potential problems in field research, and serve in generating hypotheses. In other words~ laboratory and field research should proceed concurrently, with the former contributing to efficiency in the latter.

BACKGROUND

In an article entitled "Naivete in the Laboratory," Napier and Cozan [s] proposed a model for predicting the success of business organizations~ based on top management concepts and growth in market share. The Napier and Cozan model was based on the results of a computer-supported management game (Executive Simulation, developed by Keys and Leftwich, [4]) that was played by 128 senior business policy students over a simulated two-year period. The business game incorporated a multi-dimensional approach in defining strategic management as it is practiced in a competitive business situation. Three elements are significant: (1) business organizations operating (2) in an environment, (3) pursuing patterns of activities called strategies in pursuit of organizational objectives.

The organizations are represented by groups of decision makers whose management concepts impact on decisions, which, in turn, are predicted to impact on organizational performance. The environment is represented by an economic index, a total industry comprised of all the student organizations involved in the simulation, and "public" information (sales, profits, stock price, dividends, market share, etc.) about all organizations, which is compiled for each simulated quarter.

There are many strategy options available to the management of an organization, even in a simulation. Napier and Cozan selected market share as a variable to represent organizational strategy. The contribution of the Napier Cozan research was a regression model that predicted organizational success--defined as achievement of higher than average return on total assets (ROI) at the end of the simulation. The model used two independent variables (top management concepts and increased market share) and was stated as follows:

$$ROI (4,2) = .56 + .67 (MS\text{-}A) - .28 (TMC) \qquad (1)$$

where: ROI (4,2) is the return on total assets for
quarter 4, year 2
(MS-A) is increase in market share for product
A (quarter 4, year 1)
TMC is the top manager concepts rating (quarter 4, year 1)

An ROT value of .5 represents the average ROI; a higher value represents above-average (successful) performance, while a lower value denotes a lack of success.

As Napier and Cozan acknowledged, their model represented a somewhat naive, first attempt to use available data for the purpose of predicting organizational success in a simulation. The present research was directed toward advancing this beginning a step beyond naivete by (1) incorporating management concepts taken from chief executive officers (CEOs) of actual business organizations, and (2) adding additional management decisions to the strategy variable. Investigation of possible interaction among variables was also performed.

ORGANIZATIONAL SUCCESS: THE ELUSIVE MEASUREMENT

Social psychologists have wrestled with definitions of organizational success for some time. Seashore [10] found 70 measures of performance used by 40 insurance agencies; Yuchtman and Seashore [11] Identified 76 performance variables used by insurance agencies over an 11-year period; and Campbell [1], in examining studies that focus on a single organizational effectiveness criterion, identified 19 such variables. As Katz and Kahn [3] have observed, organizational effectiveness is multidimensional, with various constituencies defining success in terms of their own desired outcomes.

Despite the many-faceted nature of organizational effectiveness, it is apparent that business organizations will not achieve success in any area (at least not for long) if they do not achieve financial success. As Peters and Waterman [6] concluded, highly regarded businesses are not truly excellent unless their financial performance matches the esteem in which they are held. In this regard, return on total assets (ROI) is a generally accepted measure *of* performance, and most evaluators equate high ROI with organizational success. Accordingly, the present research uses the same criterion of success--above average ROI--as did Napier and Cozan [5].

METHODOLOGY

A survey was conducted among CEOs of firms listed on the American Stock Exchange and Over-the-Counter markets to determine which managerial concepts they found most relevant. The top five concepts in each of two categories-- goals and information--selected by the 118 respondents were then isolated as the bases for an independent variable, which was identified by the title "managerial orientation." The contributing concepts are provided in Figure 1.

FIGURE 1
TOP MANAGERIAL CONCEPTS SELECTED BY CEOs
(N=118)

GOALS CATEGORY	INFORMATION CATEGORY
Satisfied Customers	Future Trends
High Morale	Competitor Situation
Asset Growth	Financial Resources
Stock Value	Market Analysis
Cost Reduction	Personnel Resources

A total of 50 business policy students involved in the Executive Simulation game completed a survey instrument similar to the one that had been used in the CEO survey; this measurement occurred at the midpoint of the simulation (simulated fourth quarter, year one). The student management for each firm was given a managerial orientation score by averaging the responses of each team member within a firm. A managerial orientation rating was assigned according to relative standing of the collective responses on the top five factors identified in the two concept categories by the CEOs. Finns whose managerial orientation ratings were in the top half of their industry were differentiated from firms in the lower half.

The concept of the marketing mix was used as a basis for developing a "strategy" criterion. Two of the traditional marketing mix variables--product and place--are fixed by the simulation and therefore not subject to management decisions. The other two--price and promotion--are subjects for managerial decisions, however, and were considered factors that comprise part of the management strategy. Market share, which Napier and Cozan [s] used as the sole strategy variable, was also used.

Identification of these variables resulted in the following initial hypothesis:

$$OS = f(MO, P, MS, A) \tag{2}$$

where: OS is organizational success (ROI at simulation's end)
MO is the managerial orientation at simulation's midpoint)
P is the price level of the primary product at simulation's midpoint
MS is the market share growth for the primary product at simulation's midpoint
A is the level of advertising expenditures at simulation's midpoint

Each of the independent variables associated with the game was examined for each simulated firm with regard to all organizations in the industry and coded as to whether it was in the upper or lower half of the industry average at the end of the simulation's midpoint (fourth quarter, first year). Organizational success (above average ROI) was predicted for the end of the simulated period (fourth quarter, second year).

An organization was scored above average in strategy if two or more of the strategy variables--price level, market share, and advertising expenditure level--were scored above average.

RESULTS

Amalgamation of price level, market share, and advertising expenditure level into a single strategy variable led to a restated hypothesis:

$$OS = f(MO, 5) \tag{3}$$

where: OS is organizational success (ROI at simulation's end)
MO is managerial orientation at simulation's midpoint
S is organizational strategy at simulation's midpoint

Simple comparisons revealed that the organizational success (or lack of same) could be predicted accurately for 11 of the 15 simulated organizations (73 percent accuracy) by examining either managerial orientation or the strategy ratings. Organizational success correlated with managerial orientation at .47 with a significance level of .D8; organizational success correlated with strategy at .46, with a significance level of .09.

In order to consider interaction between the managerial orientation and strategy variables, the two were combined into a single independent variable (which was labeled "managerial acumen"). The evolution of the managerial acumen construct is summarized in Figure 2.
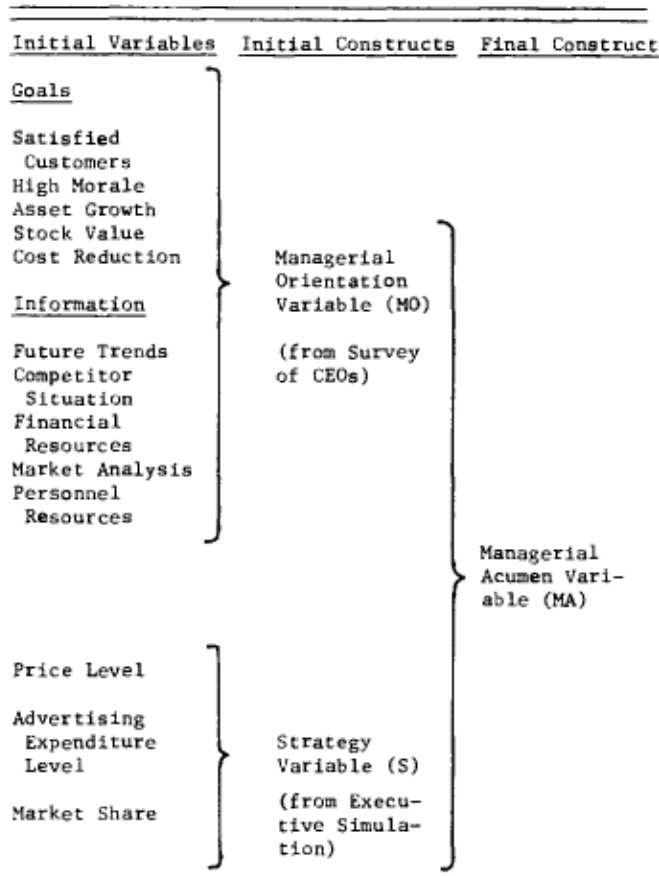
The study's hypothesis was then revised to:

$$OS \quad f(M,A) \tag{4}$$

where: OS is organizational success (ROI at simulation's end)
MA Is managerial acumen at simulation's midpoint

FIGURE 2
EVOLUTION OF THE MANAGERIAL ACUMEN VARIABLE

As Table 1 indicates, ability to predict organizational success was improved by combining the managerial orientation and strategy factors into the managerial acumen variable. Organizational success and managerial acumen correlated at .60 and the correlation was significant at the .02 level. Additionally, management acumen predicted organizational success accurately in 12 of the 15 simulated organizations (80 percent, compared to the 73 percent rate for managerial orientation or strategy considered separately).

TABLE 1
CORRELATION COEFFICIENTS

	Managerial Orientation	Strategy	Managerial Acumen
Organizational Success (ROI)	.47246	.46429	.60714
Significance Level	.0753	.0813	.0164

Regression analysis yielded the following formula:

$$OS = .25 + .61(MA) \qquad (5)$$

The formula achieved a significance level of .02 and an r^2 value of .37.

If the computed value of OS is .50 or larger, it is predicted that the organization under study will have a higher than average ROI and thus be successful. An OS value of .49 or lower predicts an unsuccessful organization

DISCUSSION AND SUMMARY

The results of this research suggest that organizational success may be predictable through analysis of a business firm's managerial orientation, product price level, market share growth, and advertising expenditure level. The predictive ability, correlations, and significance levels of the initial independent variables (managerial orientation and strategy) are surpassed when a single construct (managerial acumen) is developed to incorporate the effects of, and interaction between, the managerial orientation and strategy variables of the introductory model.

The authors acknowledge that the definition of success-- above average ROI--is relative to competitors in a simulated industry setting. It is quite possible that external environmental factors can cause even the leaders in some "real-world' industries to be considered unsuccessful (e.g., if all members of the industry have low ROT), while below average ROI in other industries might be considered satisfactory. It is also acknowledged that the Executive Simulation portrays a particular type of industry that may not represent any actual group of competitors.

In addition, internal strengths and weaknesses $_0F$ organizations (other than managerial orientation) cannot be considered--all firms in the simulation are assumed to be equally efficient and effective in executing management decisions.

Despite these inherent limitations, the results of this study indicate that laboratory simulation can be combined with field research data to identify variables and build models which can serve as bases for additional field research. The degree to which these results can be applied to actual organizations can be determined by field research that extends the present study. This is consistent with Schwenk's L9] proposal for using laboratory research to complement field research by defining relationships among variables, avoiding potential problems, and generating hypotheses.

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