

PUTTING STRATEGY INTO STRATEGIC BUSINESS GAMES

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ABSTRACT

This paper describes a strategy driven, total enterprise game. The participants select strategies and the selected strategies then determine the specific decisions. Products exhibit life-cycles, requiring participants to alter their products as customer needs change. Multiple market segments exist requiring participants to determine market focus. The strategic decisions cover the areas of marketing, production, finance, R&D, expansion, contraction, human resources, inventory and employment.

INTRODUCTION

Many total enterprise games claim that strategic planning and subsequent strategy formulation are major components of their games' decision-making processes. The Instructor's manual for The Multinational Management Game (Keys, et al., 1992, p. 8) states, "...MMG will emphasize the development of formal strategic plans..." and "...students attempt a strategic plan as they make the first real decision. Several rounds of decisions are then played and students are asked to submit a modified strategic plan..." Thus, the strategy behind decision-making is stressed. This emphasis on strategy is almost universal. The Instructor's manual for The Business Strategy Game (Thompson and Stappenbeck, 1995, p. 4) states, (the Business Strategy Game) "...allows the students to (1) craft a 5-year strategic plan, (2) gauge the long term financial impact of current decisions ..." and "... The 5-year strategic planning model gives students the capability to create a tentative set of decisions for 5 years."

The representation of the decision-making is claimed to be a top management one. In MICRO-MATIC, Scott and Strickland, (1985, p. 4), the students are introduced to the game by the sentence, "You and several other new managers have been hired for management positions..." In Airline (Smith and Golden, 1994, p. 73) it is suggested that the team have a President and up to five vice-presidents. Similar statements are made in most total enterprise simulations. Most player teams are formed by creating a set of vice-presidents who "run" the firm. But a statement in the CEO manual (Thavikulwat, 1991, p.1) is important to repeat, "Decision-making at the top differs characteristically from decision-making at lower levels..."

The final decisions on price, ordering, etc. in actual firms are not made by vice presidents, but at much lower levels in a corporation. The final price of a product is frequently made at the individual salesperson level, to meet or beat competition. The executive level makes policy and determines strategies that, if followed, provide the lower level managers with the guidelines to make the needed specific decisions. Certainly the vice presidents in major corporations do not determine the purchase levels of raw materials or decide on how many workers to hire or fire, product attributes, etc..

In most business games, the decision-making processes typically involve setting prices, promotional budgets, research and development budgets, and sometimes determining quality, product attributes, manufacturing levels, etc. for each round of the simulation. Sometimes, hours have been spent on deciding a price, even if the differences of opinion were within pennies. Far too much time has been wasted on minor deci

sion making and too little time has been devoted to selecting strategies.

It has been the authors' observation that when students have been asked to report their corporate strategies, most of the time they fit strategy to their decisions, but *ex-post-facto*. When asked to determine strategy ahead of time they do, but then they let the *heat-of-the-play* determine their decisions rather than the preselected strategies. After all, when one is up to a little below the waist in alligators, he or she forgets the purpose is to drain the swamp. Thus, the participants use some, usually unspecified, strategies to unify the tactical decisions which are supposed to represent strategic positions for their firms. If a truly strategic game existed, it would start with the participants selecting specific strategies and then the set of strategies would then determine the specific tactical decisions. This paper describes such a game.

BACKGROUND

Strategic Persistence

Based on the opportunistic model of organizational adaptation (Miller et al., 1996) researchers should expect to find that firms in turbulent industries (such as depicted in simulations) will seek new opportunities and not remain stable in their strategic focus. Further, these firms should be expected to evidence complex (and different) behaviors (Miller et al., 1996). Previous studies have shown that a substantial relationship exists between strategy selection and performance in single industries. Thus, single industry structures, like those depicted in simulations, appear to be appropriate to relate strategy choice to performance. Historically, Ansoff (1967) recognized that firms' strategies change over time. Strategies then may be dynamic, thus one would expect to see strategic change over time, especially in simulation where the dynamics of time are evidenced at a much faster rate than occurs naturally.

Simulations And Business Strategy

There has been growing recognition among business simulation developers that strategy must be taken into account in their creations. Simulations have begun to include a better, but far from perfect, ability for the players to choose strategies (Wolfe and Roge, 1997). In fact, simulations have emphasized strategy formulation since their beginnings in the late 1950s. Still, the strategy formation by most participants has generally been *ex-post facto*. That is, although participants have been told to formulate a strategy, then make decisions consistent with their chosen strategy, the participants frequently make decisions on the basis of the revelations of each period's financial statements and marketing research reports. The participants then make several rounds of decisions and, *after-the-fact*, report a strategy based upon the teams more *reactionary* than strategic decisions.

In early games, decisions were mostly focused around manufacturing and promotional inputs, progressing since the mid 1970s (Wolfe, 1976) to allow players to input strategic decisions in addition to the conventional budgetary decisions. How well do these "new" games allow for such input? Do they merely masquerade decision-making of "*ole*," (i.e., budgetary inputs), or do they allow for strategic choices which affect simulation output? Finally, do participants learn about the "real" relationships among strategy and performance, or do they just jump the hoops of the business game they played? Evidence suggest games are good learning tools for the classroom (Wolfe, 1997), but are they currently constituted in the best way?

Existing Simulations

A recent review of "strategic management games" provided some insight into how well current games cover strategic inputs (Wolfe and Roge, 1997). While five of the eight games reviewed scored above average in their coverage

of strategic management decisions, a review of the games' inputs indicated that, while there is an allowance for some strategic input, the games continue to lead with budgetary considerations and not *a priori* strategic decisions. Of those five, Intopia 2000 (Thoreli, et al., 1994), The Business Strategy Game (Thompson and Stappenbeck, 1995), Corporation (Smith and Golden, 1999), the Multinational Management Game (Keys, et al., 1992) and The Business Policy Game (Cottor, R. V. and David J. Fritzsche, 1995), strategic decision-making was primarily through budgetary actions. Thus, true strategic decision-making was still limited.

The Problems with Introducing Corporate Objectives in a Game

It is difficult for participants, when first introduced to a business simulation, to set corporate objectives with anything but simplistic concepts. In the authors' experiences, the responses of students, when asked to "turn in" corporate goals and strategies, frequently state the goal of "maximizing profits." Others have included: "produce the highest quality products at the lowest possible prices," "treat our employees fairly," "be the market leader," "have the greatest market share" and more recently "maximize stockholder wealth." Translating these objectives into strategies and decisions has rarely been successful in a gaming environment.

Some selected objectives, such as "taking advantage of a highly efficient manufacturing facility" or "making use of a superior design team" have been eliminated by game designers, as almost all games equalize the parameters at the firm level. No company has any initial advantages over any other firm. The rationale for this "equality" is all firms must have identical marginal utilities, assets and products, to be fair to players and to evaluate the results of the decisions. This is not mirroring the true competitive environment of any firm. However this is not the focus of this paper.

THE PROPOSED GAME

The proposed simulation is a strategy driven, total enterprise game. The participants select strategies and the selected strategies then determine the specific decisions. Products exhibit life-cycles requiring participants to alter their products as customer needs change. Multiple market segments exist requiring participants to determine market focus. The strategic decisions cover marketing, production, finance, R&D, expansion, contraction, human resources, inventory and employment.

Most strategies of this game are described in terms of the simulated environment. Thus, price is determined by actions based on current knowledge of competitors' past actions, not by the total free will of the players. The market place constrains the market place decisions. Low level management decisions are determined by the strategy selection or, as in the case of raw material orders, the game forecasts future sales and then orders the needed raw materials. (Note: the game can make small forecasting errors causing short term stock-outs.)

The Mathematics Of The Game

In the first paper describing the use of attributes to allocate demand (Teach, 1990), a "shadow segment" was used to reduce demand for products that did not come close to meeting the expressed demands of a particular market segment. While every segment would buy a few units of every product offered, each segment purchased primarily the products that best fit its desires. (You can fool some of the people some of the time...) The degree of fit between the product attributes and the product demanded determines the sales. With a shadow segment, the effect is magnified. Exhibit 1 shows the product life cycle without the shadow segment and Exhibit 2 shows the product life cycle with the shadow segment. The shadow moves in parallel to each market segment. This feature requires a product to meet or come close to meet-

ing the preferences of the customers, or substantial sales will be lost. If a firm offers a product that is not similar to the preferences of a market, the shadow absorbs most of the demand. In essence, the shadow demand creates the difference

between sales potential and actual sales to each market segment. (Space limitation prevents the inclusion of the mathematical detail in this paper.)

EXHIBIT 1
RESULTING DEMAND OVER TIME WITHOUT A SHADOW SEGMENT

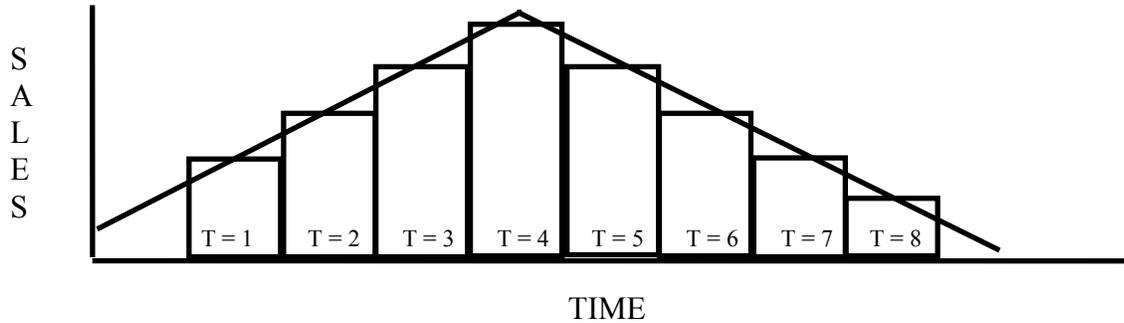
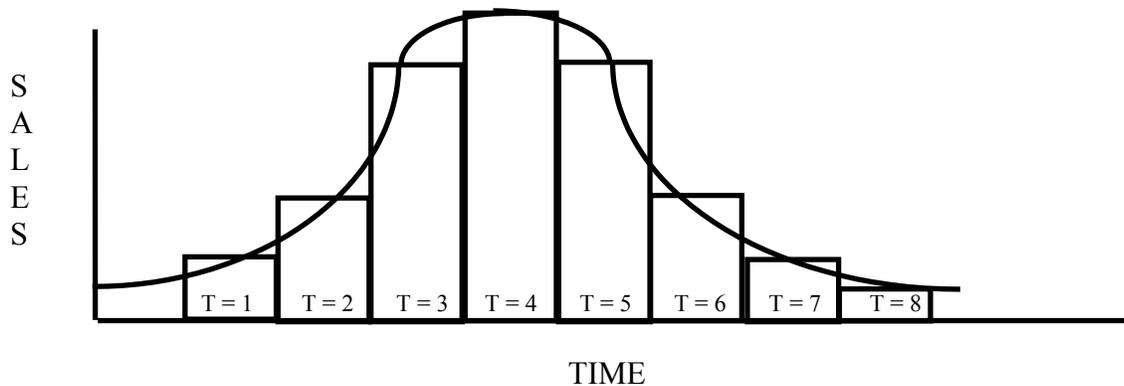


EXHIBIT 2
RESULTING DEMAND OVER TIME WITH A SHADOW SEGMENT



The Competitive Constraints And Decision-Making

A working premise of this game is that firms do not have unlimited choice. The industry and the competitors constrain decision-making. If all the firms in an industry, except one, price in a narrow range, then that one firm must consider its competitors' prices when setting its own price. It is not free to set any price unless it ignores the realities of the market place. The same is true for almost all of the marketing decisions. This competitive constraint is derived from the Theory of Oligopoly (Machlup, 1952), the economic structure most often replicated in busi-

ness simulations. For the most part, when playing this strategy-based game, the players choose strategies and these strategies determine specific decisions.

The Accounting, Reporting and Decision Cycles

It is generally considered that strategy should be persistent (Mintzberg, 1987). That is, strategy is not something that should be changed on a day to day or even on a quarter to quarter basis. As such, this strategy game has an annual decision cycle. However, consistent with current reporting requirements for publicly held corporations

in the US, this game reports results quarterly for public consumption. This is accomplished by using the same strategy decisions and iterating the game 12 times for a simulated year, aggregating every three months into quarterly reports, and every 12 months for the annual report (Teach, 1998). The game also computes monthly results of sales, production, employment, cash positions and inventories and reports them to the individual teams. The strategy driven budgetary decisions are exponentially smoothed to provide the changing effects over the 12 monthly iterations. In addition, seasonal factors are included as are time lags needed for construction, training and converting accounts receivable to cash. This provides the participants with more frequent periods in which to track the affects of their strategy selections.

Most business simulations are run for a very limited number of accounting / reporting cycles, typically between six and twelve. There is no corporate memory and the participants have no history of past policy determinations and only a limited exposure to the competitors' decision-

making processes and they have only a few decision-making opportunities. This provides limited opportunities to determine strategy and to see the effects of strategic choice.

The Market-Place Environment

This strategy-oriented game accommodates four to eight teams with the number of market segments equal to the number of competitors plus three. Each market segment has a unique set of preferences (but not such a strong preference that it excludes all other products) based upon a combination of four attributes. This is an adaptation of the attribute demand model first reported by Teach (1990), but, with a new twist. Market segments are dynamic, that is, customers change their preferences for the attribute mix over time at different rates. Exhibit 3 illustrates this phenomenon, using a two-dimensional reference frame for two market segments over a five periods.

EXHIBIT 3
EXAMPLE OF TWO MARKET SEGMENTS OVER FIVE PERIODS IN A TWO
ATTRIBUTE SPACE

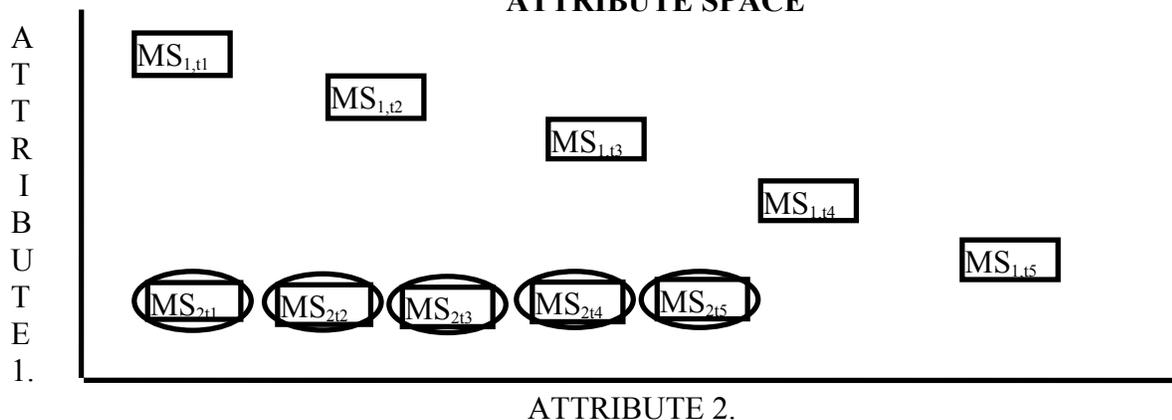


Exhibit 3 indicates that Market Segment 1 is preferring less of Attribute 1, but more of Attribute 2 as time progresses from $t = 1$ to $t = 5$. Market Segment 2 wants the same amount of Attribute 1 and more of Attribute 2 as time progresses from $t = 1$ to $t = 5$. It should also be

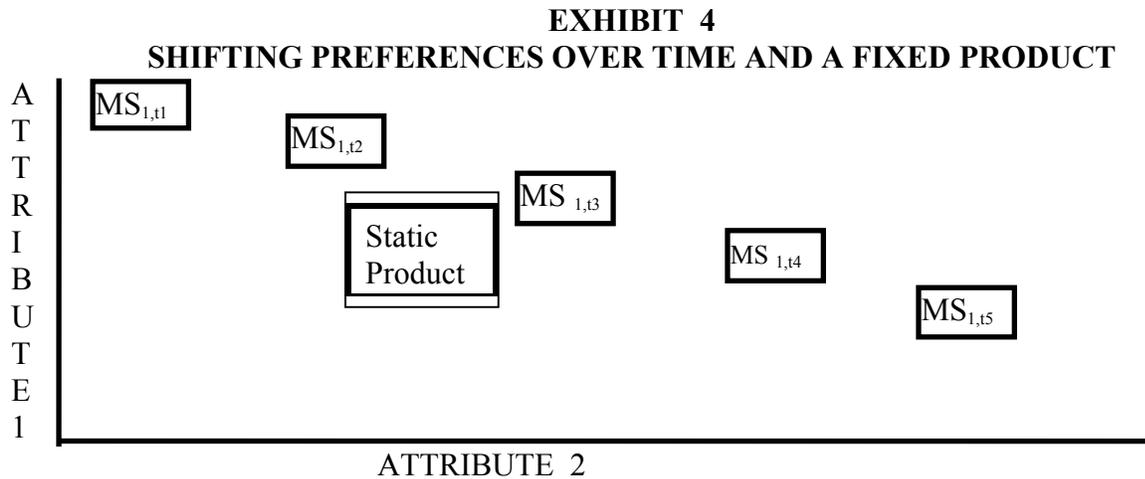
noted that Market Segment 1 is changing at a faster rate than market segment 2. In this strategy game, the direction of movement can be determined from two observations, and the rate of change can be determined using three observations. The direction of movement and rate of

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change are constant, and thus, easily determined by the participants.

A byproduct of the shifting positions of the market segments over time and the existence of the shadow segments is that each product and market segment, *ceterus paribus* conditions, will exhibit the classic product life cycle as was shown in Exhibit 2. Thus, there exists a strategic

time to change the product, but change too often, the costs of change exceeds the benefits. Change too soon and the gain is not significant. Change too late, the market size drops substantially. This teaches the *Wayne Gretzky principle* “Don’t skate to where the puck is, skate to where the puck will be!” Exhibit 4 shows how the market levers behind a static product.



The Start Up

In the tradition of starting all firms equally, players are presented with the results of three periods. In these periods, all firms have a common product and have made common decisions for each period. The scenario is the Department of Justice has broken-up the original firm into N independent firms, because the original firm held a monopoly position. The financial statements have been recast to represent what each of the new firm’s results would have been, had they existed. Thus, at the start, all firms are producing identical products, with identical prices and promotional budgets, etc., and are attempting to appeal to the entire market place. Presented with this position, each firm’s management team must decide which strategies should be selected to maximize their firm’s profits. Each market segment is identified and each segment’s “ideal product” is identified as well

as each segment’s sales potential. By showing the segments positions over three periods, the decision makers should be able to determine the path and the speed of each segment over the length of the game. This perfect information simplifies the knowledge base needed for decision-making

The Strategy Decisions

Each team will make the following decisions:

1. **What pricing strategy will the firm adopt?**
 - [] keep the price constant, thus no changes will be made to the previous year’s price.
 - [] very high price - set the price 15 percent above their competitors’ last year’s average.
 - [] high price - set the price 10 percent above their competitors’ last year’s average.

- slightly higher price - set the price 5 percent above their competitors' last year's average.
- average price - set the price equal to the competitors' last year's average price.
- slightly lower price - set the price 5 percent below their competitors' last year's average.
- low price - set the price 10 percent below their competitors' last year's average.
- very low price - set the price 15 percent below their competitors' last year's average.

2. What market segmentation strategy will be adopted?

- All potential customers will be targeted.
- The firm will pursue a limited number (max. 3) of market segments and choose them.

The particular segments pursued by the firm will be:

- Seg. 1 Seg. 2 Seg. 3 Seg. 4
- Seg. 5 Seg. 6 Seg. 7 Seg. 8
- The firm will focus on a single market segment. Segment _____.

A total market strategy distributes the promotional budget to each segment proportional to each segment's sales potential. If a market segmentation strategy is employed, 50% of the promotional budget will be allocated to the selected segments (proportional to each segment's market potential) and the remaining 50% will be allocated to the market as a whole. If a market focus strategy is selected, 75% of the budget is focused in the single selected market segment.

3. What strategy will be selected to determine the firm's promotional budget?

Like the pricing strategy, the choices are limited to eight possibilities: no change, or +20%, +10%, +5%, the same as, -5%, -10%, -20% of the competitors' average expenditure in the previous period.

4. What sales intensity strategy will the firm pursue?

Like price and promotion, the choice will be limited to a small set: no change, or +15%, +10%, +5%, the same as, -5%, -10%, -15% of the competitors' average number of sales agents in the previous period. Note, sales agents are to be used. Thus, terminations can take place without cost and direct sales become 100 percent variable. Initially, the sales agents' commissions will be set at 20% of the product's price. A training cost of \$5,000 will apply to each newly acquired agent and a one quarter year's phase-in for sales will be applied.

5. What product strategy will be pursued?

- keep the current product
- change the product to:
 - ___ units attribute 1 ___ units attribute 2 ___
 - units attribute 3 ___ units attribute 4.

If the product is changed, all current inventory is salvaged at 75% of the raw material costs and the new product is started in production immediately. However, the learning curve will be reset to zero cumulative units whenever a product change occurs, no matter how slight.

6. What R&D strategy will determine the R&D budget of the firm?

The eight point scale of no change from last period, and +15%, +10%, +5% the same as, - 5%, -10% and -15% of the last period's budget.

7. What strategy in R&D allocation between product and process improvement will be selected?

- Product improvement only
(100% to product improvement)
- Primarily product improvement
(75 % to product improvement)
- Equal emphasis
(50% product improvement -
50% process improvement)

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- Primarily process improvement
(75% to process improvement)
- Process improvement only
(100% to process improvement)

Product improvements increase demand, process improvements decrease cost.

8. *What inventory strategies will the firm follow?*

- The firm will produce product on a “Just-In-Time” basis.

The firm will anticipate demand and set production schedules to meet the expected level of demand. This is determined within the computer program, not by individual team decisions. Some errors may occur and some sales will be lost due to stock outs.

- The firm will anticipate demand, but it will attempt to maintain an inventory of 20% of monthly demand in order to reduce “lost sales.”
- The firm will anticipate demand and attempt to equalize the product schedule over each quarter, building inventory in slow times, depleting inventory in high demand times, even encountering some “lost sales” at very high demand times.

9. *What manufacturing employment strategy will the firm follow?*

- Keep employment constant - have employees perform preventative maintenance and facility clean-up when not producing products (reducing maintenance cost). The firm incurs above average unit labor costs, but has small hiring, training and unemployment costs as well as reduced maintenance costs.
- Keep the same workers currently under contract.
- Employ _____ new workers at the start of this year.
- Fire _____ existing workers to reduce the work force.

- Hire and fire production workers to meet the production schedule on a monthly basis. This minimizes the direct unit labor costs, but increases the costs of hiring, training and unemployment.

10. *The firm's capacity expansion will be guided by what strategies?*

- The firm will expand as needed. When the firm forecasts demand that it can not meet due to inadequate facilities, it builds new capacity at once, in capacity units of 1,000 per month. The time needed to construct this increased capacity is three months. The firm outsources until the facility is completed. Outsourced product costs 150% of current manufacturing costs, plus \$50,000 in added administrative costs.
- The firm expands only when excess demand is estimated to be 12,000 units per year. When this occurs, a plant expansion is undertaken in 25,000 unit blocks. The time needed for the expansion is 12 months. All forecasted excess demand is outsourced until the plant addition is complete. The cost of outsourced products is 125% of current manufacturing costs, plus \$200,000 in administrative costs.
- The firm will outsource all its excess demand needs at a cost of 120% of current manufacturing costs, plus an administrative charge of \$25,000 per month.
- The firm reduces its production capacity by _____ thousand units per month. The cost of reducing capacity is 1/2 the current construction costs, plus \$50,000 in administrative costs.

11. *What will be the firm's financial strategies to cover capital needs?*

- The firm will borrow in the short term market for all capital needs and repay the debt as quickly as possible.
- The firm will enter the bond market for its capital needs (in increments of 1 mil-

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lion dollars) as soon as it needs money. (Short term funds will be used for needs under a million.) These funds are repayable five years after the bond is issued. If there is short term debt the funds raised will first be used to repay it.

- The firm will sell stock to raise capital needs (in increments of 10 million dollars) as soon as the firm needs money. (Short term funds will be used for needs under 10 million.) Funds raised will first be used to pay off any short term debt then all bond debt.

12. *What will be the firm's dividends strategy?*

- Pay no dividends
 Pay 10% of profits in dividends
 Increase previous dollar amount of dividends by 5%
 Decrease previous dollar dividends by 5%.

Other Decision Requirements

The participants will be required to estimate the results of their strategy choices. These will be:

1. Expected annual dollar sales by the industry in the next fiscal year.
2. Expected annual dollar sales by the firm in the next fiscal year.
3. Expected market share of the firm (in units) for the fiscal year, by market segment.
4. Expected maximum and minimum manufacturing employment in the next fiscal year.
5. Expected maximum and minimum product inventory in the next fiscal year.
6. Expected minimum cash position (at the end of every month) during the next fiscal year.

The Marketing Research Function

The marketing research function is different in this game. The same items of information are provided to each team for a base fee of \$250,000 per year. The attribute mix of each product in the market place and the market po-

tential for each market will be provided without error. But all other information will be provided on an estimated basis. The research information is calculated without error, but a normally distributed random number centered on 100% (or 1.0) is generated. The actual data are multiplied by this scalar and reported as the estimated information. The greater the amount paid for the research, the less variance in the random number generator. Thus, the more the team pays, the more accurate the estimates are. The error term asymptotes to zero as the amount spent on the research approaches infinity. The last decision then is:

What is the Marketing Research Budget for next fiscal year _____?

Minimum \$250,000.

The Long Term Perspective Of Strategy

Strategy is not something easily changed. A firm's strategy is frequently explained to all employees and employees are expected to direct their work as to hold to the company's strategies. Because of this natural tendency to be persistent, it is expected that firms change strategy only when it is necessary. Changes cost money. People need to be informed and plans need to be changed to conform to new strategies. Beyond the annual reports and 10Ks, the financial community needs to be informed of the changes, and the reasons for changes in strategy must be explained. To mirror this reality, the costs of changing strategies are associated with the changes. This charge is displayed on the decision screen (form) directly beneath each strategy decision. In the Profit and Loss statement there appears a line that identifies each strategy change cost. The cost of changing the pricing strategy will be initially set (for example) at \$5,000;

- promotional strategy change - \$10,000;
- market segmentation strategy - \$20,000;
- sales intensity strategy - \$25,000;
- product strategy - \$10,000;
- R&D strategy - \$15,000;
- R&D allocation strategy - \$15,000;

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inventory strategy - \$25,000;
manufacturing employment strategy
- \$15,000;
expansion strategy - \$30,000;
financial strategy - \$50,000;
dividends strategy - \$5,000;
to stop dividend payments, once started
- \$20,000;
and to cut dividends, once started - \$10,000.

All the numbers noted in the section above are parameters and may be altered by the game administrator.

SUMMARY AND CONCLUSIONS

Management literature describes the relationships of firm strategies to firm performance. Simulations generally end with the reverse, i.e., short term tactical decisions result in an after-the-fact strategy. Firms select strategies as they seek to maximize their performance in their industry. This strategy game allows the participants to first select strategies, which then lead to operational decisions, and ultimately to firm performance. The participants do not spend their time on low level decisions, but on strategic ones. This allows them to view the relationships between strategy selections and performance, both with their particular simulated firm as well as in the simulated firms with which they compete. Participants are then better able to anticipate needed strategy changes, abandon market segments, create a new focus, extend market reach, etc.. They learn how to evaluate their strategic position and the needs for change, as opposed to learning how to act tactically. This game can be played and results evaluated quickly, an important feature in the classroom, in short courses, in management training, and in executive programs as well.

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