A SIMULATION OF HAWAII'S BANKING INDUSTRY: ISSUES OF REALISM AND EDUCATIONAL VALUE

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ABSTRACT

A simulation of Hawaii's banking industry was constructed and utilized for five semesters in a core MBA Marketing course. Students were assigned to teams representing the banks of Hawaii and made twenty cycles of marketing and management decisions in a competitive situation. Student feedback and performance indicate that while modeling the complex content of the real environment has significant educational value, modeling the complexity of real world decision making processes causes high frustration levels which may interfere with the learning process.

ENVIRONMENT

A large scale simulation was constructed to complement the text and case material offered in a core MBA Marketing course. The purpose of the simulation was to provide a service industry laboratory for graduate students to practice marketing analysis, strategy development and decision making. Other simulations considered (Harms and Huff 1988), (Hinkle and Koza 1975), (Mason and Perreault 1987) use the manufacturing sector and emphasize production and physical distribution decisions. Hawaii's economy is service oriented. Work done by Cadotte demonstrated that complex, multidimensional simulations can have significant pedagogical merit. (1987). Also, Lillien and Kotler have established the mathematical logic required to build large scale simulations for service industries (Kotler 1984). The relationship between market share and corporate performance has also been explored and models developed (Naylor 1971). These efforts demonstrated means to relate marketing decisions to the balance sheet and income statement. The Hawaii banking industry was chosen because it has an outstanding record of performance (Alpert and Lynch 1989), provides excellent examples of effective marketing decision making and is a major employer of the University's MBA graduates. Lastly, the industry is facing contemporary marketing challenges.

MODEL DESIGN

A complex model was needed to provide a laboratory for student to react to external events, to perform market research in the simulated and real environment and to have sufficient detail available to emulate the decisions of today's Hawaii bankers. The model was designed to include various alternative economic and political scenarios, and the actual banks of Hawaii with their market positions and resources. The logic flow and the relationships among the major elements of the model are shown in figure one.

Figure 1
Flow Diagram

The economic module generates projections of population, gross national and state product, the state consumer price index, disposable income, state government surplus or deficit, new business starts, visitor counts, defense spending, agriculture revenues and real estate multiple listing activity. Four scenarios, which vary in their predictability by the student, can be selected by the instructor. The output of this module is used as input to the market size module.

The market size module determines the size of various bank markets. Deposit markets include commercial and individual deposits, as well as government, foreign, and mainland flows of funds into the state. Loan market sizes are determined for the commercial, service industry, real estate and
consumer sectors. This module also determines the initial market size lost to non-banking institutions. This magnitude is subsequently adjusted by player interest rate decisions. Initial market sizes were validated against real world values (Department of Commerce and Consumer Affairs 1986; FDIC 1987; Dun and Bradstreet Financial Profiles Department 1986).

The district detail module is a data base of demographic, economic and consumer behavior for the forty one census districts in Hawaii. Variables included are population, age, ethnicity, educational level, and income. The module projects variable values for the twenty year period of play. The initial number of branches and automatic teller machines (ATM's) for each district and bank are also included. This module also generates market research reports which can be requested by the student.

The decision module accepts the sixty-five decision made by each bank team each year. These decisions cover nine marketing decision areas. These are basic marketing strategies; selection of target markets; product offerings and customer service levels; distribution decisions such as branch and ATM construction; promotion, which includes theme and media determination; pricing strategies such as interest rates charged and paid; marketing management decisions including salary levels and training budgets; market research purchases; and political action committee budgets (Berry 1971; Tyler 1974). The decisions made by the students are analyzed for consistency and to determine if sufficient resources have been allocated to the marketing function. Penalties are imposed for oversights. Creative ideas that do not fit within the model's structure are evaluated and rewards assessed in the form of increased effectiveness of decisions made. Market share is allocated by sector to each bank using the Kotler methodology cited earlier. Long term decision impacts are also collected in a subroutine for use in subsequent rounds.

The output module translates market share and other data, such as interest rates, into yearly performance data. These data are used to modify the previous year's balance sheet (statement of condition) and income statement. Using this method momentum and inertia can be modeled. A current statement of condition and income statement are developed and become major performance indicators for the students. Comparative market share data, profit analysis, as well as an industry comparisons, are also provided.

Model results were compared to actual bank performance using cautious, conservative decisions. Model results were consistent with actual performance. Results were also compared to national averages of performance with consistent results (Dun and Bradstreet Economic Analysis Department 1988). By anecdote, one student team determined, in an interview with the president of the bank they represented, that they had predicted the bank's next, and then, confidential expansion plan.

STUDENT PERFORMANCE AND REACTION

The first semester was used as a test. Twenty-five students were subdivided into eight teams. Fourteen rounds were played, results assessed and changes made to the model. The model was then used in the four subsequent semesters. The results are shown in table one.

**TABLE 1**

<table>
<thead>
<tr>
<th>Bank</th>
<th>Semester Performance Rankings</th>
<th>Actual Performance</th>
<th>Rank (Mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1    2   3   4   1**</td>
<td></td>
<td>1     5393</td>
</tr>
<tr>
<td>Bank of Hawaii</td>
<td>3  4</td>
<td>1  4</td>
<td>2</td>
</tr>
<tr>
<td>First Hawaiian Central Pacific First</td>
<td>5  7  7  7  4</td>
<td>3696  2</td>
<td></td>
</tr>
<tr>
<td>Interstate City Bank Liberty Bank Hawaii National</td>
<td>4  7  5  8  1</td>
<td>3696  2</td>
<td></td>
</tr>
<tr>
<td>Honolulu</td>
<td>6   5</td>
<td>3   8</td>
<td>8</td>
</tr>
</tbody>
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* 1987 Assets and Return on Average Assets from Yoneyama 1988a. ** Tie

Student performance was evaluated on percentage increase in loan market share, percentage increase in deposit market share, percentage increase in total assets, capital surplus generation as a fraction of
total starting assets and net income generation as a fraction of total starting assets. Teams were rank ordered on each criteria, and the rank orders summed to determine an overall ranking.

Team having members from the financial sector had an advantage. Accounting, senior management and customer service management experience were also highly valued by the students. Teams with contacts at the senior level of banks also fared better. Hard research into the Hawaii banking industry also paid dividends according to the students. One of the most successful teams developed a Lotus based simulation model of the model and used it to predict competitive behavior and economic trends.

Teams that did poorly did not appreciate the complexity of the task and resorted to simple strategies. Inconsistency, wide swings in resource allocations, high risk loan portfolios, aggressive expansion schemes and gamesmanship also plagued these poor performing teams. In three of the four rounds, all of the banks were profitable. In semester four, however, six out of the eight banks lost money and the industry market share became heavily concentrated in the one largest bank. In this round the teams began to compete on price. The interest rate spread because narrower each year. At year eight there was an economic downturn and only one bank, the largest, had the financial reserves to withstand it. This result can be attributed to an improper evaluation by students as to the relative importance of the marketing mix components in this industry.

Students were asked to provide written critiques of the simulation experience after each semester. The predominant themes of the positive comments were that the simulation was very interesting, taught them about the complexities of marketing decisions in the banking industry, and provided insights into the relationships between the economic environment and marketing strategy. Other favorable learning outcomes were an appreciation of the importance of customer service in a service industry and the factors leading to its enhancement, and a better understanding of why banks are currently altering their traditional marketing strategies. Students also indicated they enjoyed the competition and had strong incentives to do well. They believed the secrets of success were competitiveness, an entrepreneurial approach, knowledge of the industry, diligence and prudence.

The primary theme of the critical comments was that the students did not have sufficient control. This critique had five facets. The students wanted more information on significant forces, environmental and competitive. They believed they should have all environmental information, commenting that in the real world, information on these type would have been available. Second, they wanted more information on the cause and effect relationships modeled in the simulation. Third, students did not like having a prudent, well researched and carefully conceived strategy thwarted by a competitor. The frustration level was high when this happened and teams were at a loss on what action to take in the next round. Fourth, students objected to the fidelity and time adjustments. Adjustments were made to the managerial effectiveness of the bank's marketing department if the team's did not allocate sufficient resources to the marketing function and there was a time delay in some decisions. Fifth, the students did not like being under time pressure to review the last round's results and develop a new set of decisions in less than a week. They believed this led to incomplete analysis. In sum, the students accepted the complexity of the industry but did not accept the simulated inability to control events with absolute fidelity.

SUMMARY

Student feedback indicated that the simulation helped develop an understanding of the complexity of marketing strategies, mix and management decisions. As such, it successfully accomplished one of the principal objectives for marketing simulations, namely, to provide an environment where students can realistically apply formal models and theory learned elsewhere (Lewbel 1988). Conversely, the high frustration levels created by the uncertainty and lack of control was not well accepted. This side effect may have interfered with the learning processes of the simulation. Modifications are being made as a result of these lessons.

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