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STRATEGIC MARKET PLANNING WITH THE COMPETE PRODUCT PORTFOLIO ANALYSIS PACKAGE: A MARKETING DECISION SUPPORT SYSTEM

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ABSTRACT

This paper presents the COMPETE Product Portfolio Analysis Package, a new pc-based marketing decision support system used by competing participant teams in the marketing simulation COMPETE to apply their knowledge of product portfolio analysis in strategic market planning. This package enables each firm having numerous products serving several markets with differing potentials to visualize and analyze the strengths and weaknesses of their portfolio of products relative to the product portfolios of their competitors. Based on this analysis, each firm allocates its limited resources so as to optimize the performance of the portfolio of products while maintaining cash in balance.

INTRODUCTION

The primary purpose of this paper is to introduce the COMPETE Product Portfolio Analysis package, a new personal computer (pc)-based marketing decision support tool that facilitates the integration of computers into the marketing curriculum. This package enables competing participant teams in the marketing simulation COMPETE (Faria, Nulsen and Roussos 1984) to apply their knowledge of product portfolio analysis developed by the Boston Consulting Group (Boston Consulting Group Staff 1972) in strategic market planning.

A key objective of business school education is to prepare students for decision-making responsibilities in their future careers. Principles and facts about various facets of business can be taught in the classroom. However, the ability to make decisions in a complex, dynamic, and uncertain environment is best learned through experiential learning. A growing number of marketing simulations, such as COMPETE, provide students with the opportunity to apply their knowledge of marketing concepts and to practice and improve their decision-making skills.

The COMPETE Product Portfolio Analysis package is designed for use by competing participant teams in the COMPETE marketing simulation. This graphics application package has been tested and integrated successfully into the marketing curriculum at the University of Hawaii during the Fall 1990 semester. The objective of developing and integrating this decision support package into the marketing curriculum is to provide competing participant teams the opportunity to plan, implement, and control a marketing program for their portfolio of products (strategic business units).

Decision Support Systems

With the advent of personal computers and the rapid growth of end-user computing, business schools strive to: (1) prepare students to perform effectively in the modern business computing environment, and (2) train managers in the use of computers for effective decision support. Some researchers have evaluated the role and performance of decision support systems in business education. A recent study revealed that computer-based decision support positively influenced the accuracy and quality of decision making, and various student characteristics such as aptitude, attitude, domain experience, domain expertise, gender and system experience (King, Premkumar and Ramamurthy 1990).

The decision-making process may be divided into three stages. The environment is scanned for conditions calling for decisions, possible courses of action are analyzed, and a particular course of action is selected from those available (Simon 1960). First, raw data are obtained, processed, and examined for clues that may identify problems. Second, after an attempt is made to understand the problem, solutions are generated and tested for feasibility. Alternative courses of action are developed and analyzed. Finally, a particular course of action is selected from those available, and the decision is implemented. There is evidence that this decision-making process is facilitated through the use of a decision support system (Forgionne 1986).

A decision support system is a computer-based information system that supports the process of structuring problems, evaluating alternatives, and selecting actions for more effective management (Forgionne 1988). In general, a decision support system is the hardware and software that permits a decision-maker or group of decision-makers to deal with a specific set of related problems. It provides tools to amplify a manager's judgment (Sprague 1980). Current research in the field of artificial intelligence and expert systems will spawn the development of a new breed of decision support systems (Keim and Jacobs 1986).

Marketing managers use decision support systems to analyze market data, and to plan, implement, and control their marketing programs. Marketing decision support systems have been developed and used in department-level promotion mix planning (Allaway, Mason, and Brown 1987) and in advertising research (Knuckles 1987). The COMPETE Product Portfolio Analysis package permits participant teams to review the results of their decisions and to compare their own performance with that of their main competitors. The additional insight gained from this review helps the participant teams make better decisions and provides the basis for strategic market planning.

STRATEGIC MARKET PLANNING

Strategic market planning is a complex problem for multiproduct multimarket companies. These firms may have numerous products serving several markets with differing potentials. Some products may be in a dominant position relative to competitors, while others may be in a weaker position. Each product will have its own strategy, and may face several competitive products having their own marketing strategies. Some products may be profitable while others may need cash to finance growth or to fight competition. Faced with this complex situation, the organization must allocate its limited resources among these products in order to optimize its overall performance (Abell and Hammond 1979).

In order to optimize the overall performance of its portfolio of products, the organization first monitors and analyzes the performance of each of its strategic business units (products). This analysis is conducted by the firm in order to decide which strategic business units to build, maintain, harvest, and divest. One of the best known and widely used models for this purpose is the Boston Consulting Group Product Portfolio Analysis model (Kotler 1988).

The product portfolio approach developed by the Boston Consulting Group assigns strategic roles for each product based on the product's market growth rate and market share relative to competitors. These individual roles are then integrated into a strategy for the whole portfolio of products, taking into consideration the product portfolios of the main competitors. The objective is to optimize the performance of the entire portfolio of products, while maintaining cash flow in balance.

The growth share matrix (GSM) and the growth gain matrix (GGM) are used to display the relevant information about the firm's portfolio of products. These displays help to reduce the inherent complexity of the problem to manageable proportions. The heart of product portfolio analysis involves the creation and interpretation of the GSM and GGM displays for the firm and its main competitors.

Based upon GSM data, each firm's strategic business units (products) are classified into four categories. First, "Gash Cows" are products that have a dominant share of slowly growing markets. These products provide cash to pay dividends and interest on corporate debt, cover overhead, finance R&D, and sustain the growth of other products. Second, "Dogs" are products with a low share of slowly growing markets. These products neither generate nor require substantial amounts of cash, and they are often called "cash traps." Third, "Problem Children" are products with a low share of fast growing markets. These products require substantial resources to gain market share and to become strong members of the product portfolio. Finally, "Stars" are high-growth, high-share products whose present modest cash requirements will change to a large surplus when the market matures (Abell and Hammond 1979; Day 1986).

The COMPETE Product Portfolio Analysis enables each of the competing participant teams in the COMPETE marketing simulation to generate GSMs and GGMs for their own and competing firms. These matrices are used by the participant teams in marketing strategy planning.

THE MARKETING SIMULATION COMPETE

COMPETE (Faria, Nulsen, and Roussos 1984) is a widely used marketing simulation designed to provide students with marketing strategy development and decision-making experience. Competing participant teams are placed in a complex, dynamic, and uncertain environment. The participants experience the excitement and uncertainty of competitive events and are motivated to be active seekers of knowledge. They learn the need for and usefulness of mastering an underlying set of decision-making principles.

Competing teams plan, implement, and control a marketing program for three high-tech products in three regions within the United States. The features and benefits of each product and the characteristics of consumers in each region are described in the student manual. Based on a marketing opportunity analysis, a mission statement is generated, specific and strategies are formulated to achieve these goals.

Constant monitoring and analysis of their own and competitive performance helps the teams better understand their markets and improve their decisions.

Each decision period (quarter), the competing teams make a total of 73 marketing decisions with regard to marketing their three brands in the three regional markets. These decisions include nine pricing decisions, nine shipment decisions, three salesforce size decisions, nine salesforce time allocation decisions, one salesforce commission decision, twenty-seven advertising media decisions, nine advertising content decisions, three quality-improvement R&D decisions, and three cost-reduction R&D decisions. Successful planning, implementation, and control of their respective marketing programs requires that each company constantly monitor trends in its own and competitive decision variables and resulting performance. Monitoring performance is facilitated by the use of Lotus 1-2-3 spreadsheet, IFPS/Personal modeling language, and "C" graphics software packages.

The COMPETE marketing simulation is used at the University of Hawaii at Manoa undergraduate (BBA), graduate (MBA), and post-graduate levels (Executive MBA Program and Pacific Asian Management Institute International Business Program). The primary objectives are to: (1) explore the key tools of marketing management, (2) improve analytical, decision-making, and communication skills, (3) accomplish group objectives through team work, and (4) apply the tool kit assembled and practice the skills developed.

In order to achieve the above objectives, the COMPETE marketing simulation is used to provide participants with the opportunity to: (1) learn strategic marketing concepts, (2) assemble a marketing tool kit, (3) use the tool kit to analyze marketing opportunities and performance, (4) prepare and submit periodic written reports on the use of marketing tools, and (5) present group objectives, strategies, and performance, at the end of the semester using the marketing tool kit assembled.

During the course of the simulation, the competing teams learn and apply key marketing concepts and marketing decision-making tools. These marketing decision-making tools and concepts include (1) market segmentation analysis, (2) positioning, (3) sales analysis, (4) cost analysis, (5) performance analysis, (6) break-even analysis, (7) sensitivity analysis, (8) regression analysis, (9) product lifecycle analysis, and (10) product portfolio analysis. They use pc-based graphics packages to present (1) product position maps, (2) growth share matrices, and (3) growth gain matrices for themselves and their key competitors. These charts are used by the participant teams In analysis, decision-making, report submission, and class presentation

COMPETE PRODUCT PORTFOLIO ANALYSIS PACKAGE

The COMPETE Product Portfolio Analysis package is a pc-based marketing decision support tool that exposes participant teams to the operation of a marketing information system. As in any information system, a variety of inputs are processed with available technology to generate a range of outputs needed by users. Easily accessible models interact with data entered by the user from COMPETE simulation printouts to support decision-making in an interactive manner. The data entered are transformed into relevant user information by the COMPETE Product Portfolio Analysis

Package. The resulting product portfolio analysis displays enable the competing participant teams to analyze the strengths and weaknesses of their own portfolio of strategic business units and those of their main competitors. Based on this analysis, the participant teams can formulate their own marketing strategy.

The decision-maker is the focal point of the COMPETE Product Portfolio Analysis marketing decision support package. Participants use this marketing decision support tool to store, retrieve, and manipulate information. They can structure problems, simulate proposed decisions under specified conditions, and evaluate alternatives.

This pc-based marketing decision support system is written in Borland's Turbo C Version 2.01 programming language. This package will work on any IBM PC/XT/AT/ PS2 or compatible clone running IBM-DOS or MS-DOS version 3.2+. The program requires 640k bytes of random access memory (RAM) and a color graphics adaptor. A planned upgrade will allow use of the program on WA and VGA displays with better resolution with color.

Participant teams input data on (1) sales in units and (2) price for each product in each region for their own firm and for each of their competitors. Based on this data, the COMPETE PPA worksheet will first compute the intermediate outputs: (1) relative market share (RI(S), (2) industry growth rate (IGR), (3) brand growth rate (BGR), and (4) sales volume, for each of the strategic business units of each of the five competing firms. Next, these intermediate outputs are entered by the user into the COMPETE PPA Graphics Package. Based on the RMS, IGR, BGR, and sales volume entered, the COMPETE PPA Graphics Package generates the GSM and GGM on the CGA monitor screen (in high-resolution mode) for the firm requested. Lastly, participants may use the COMPETE PPA Package to obtain hardcopy (printed output), if the computer is attached to an IBM-compatible graphics printer.

GSM and GGM displays are generated at the end of the second and third year of operations and permit the participant teams to conduct static, comparative static, and dynamic analyses of their own product portfolio and the product portfolios of their main competitors. By superimposing the display at the end of the third year of operations on the display at the end of the second year, the participant teams can determine the trajectories (direction and degree of movement) of each of their products. Competitor product trajectories can also be generated and analyzed. Based on these displays, the competing participant teams can (1) check for internal balance in their product portfolios, (2) look for trends, (3) evaluate competition, (4) consider factors not captured in the portfolio display, and (5) develop possible "target" portfolios along with associated strategies for achieving them.

Hardware and Software Requirements

The COMPETE Product Portfolio Analysis package requires the following system components and characteristics:
1. An IBM PC/XT/AT/P52 or compatible clone with one double-density disk drive.
2. IBM-DOS or MS-DOS Version 3.2+ operating system.
3. At least 640k bytes of CPU random access memory.
4. The Compete Product Portfolio Analysis Version 1 program disk.
5. Output data from successive sessions of the COMPETE game, and
8. A dot matrix printer with graphics capability for printing graph output.

The data generated by the marketing simulation game COMPETE are rich enough to enable the participant teams to use several marketing concepts and key decision-making

tools. These include (1) market segmentation analysis, (2) breakeven analysis, (3) contribution to margin analysis by product and by region, (4) proforma analysis, (5) sales forecasting using trend analysis and multiple regression analysis, (6) performance and cost analyses with respect to objectives and competition and over time, (7) product portfolio analysis using the GSM and the GGM, and (8) sensitivity analysis using the IFPS/Personal "What If and "Goal Seek" commands. These marketing concepts and decision-making tools are used by the participant teams to plan, implement, and control their marketing programs. The phases of the marketing management process, in which each marketing concept or decision-making tool is employed are identified in Table 1.

CONCLUSION

The COMPETE Product Portfolio Analysis package is a simple yet powerful pc-based decision support system that may be used in strategic market planning. It is used by competing participant teams to analyze, plan, implement and control their respective marketing programs. It directly involves the decision-maker in the analysis and evaluation process, and thereby facilitates organizational communication, acceptance and implementation of the resulting decisions. Further, it encourages rational decision making through the analysis of dynamic and complex relationships and the evaluation of alternative courses of action. This package enables participant teams to perform a higher level of marketing analysis with a lower level of effort. Specifically, the teams will spend less time in entering the data and generating the GSM and GGM displays, and more time in analyzing the data and formulating informed marketing strategy. However, this decision support tool is designed to assist the marketing manager in the decision-making process and is not a substitute for it. In the final analysis, a successful marketing program is the result of a well-conceived marketing strategy, a balanced marketing mix directed toward a target group of consumers, and the careful implementation of pricing, promotion, distribution, and production policies.

TABLE 1
MARKETING PLANNING IMPLEMENTATION AND
CONTROL TOOLS

	Tool	Plan	Impl-ement	Con-trol
1	Situation Analysis	XX	xx	
2	Marketing Opportunity Analysis	XX	xx	
3	Positioning (Marketing Warfare)	XX	xx	
4	sales Analysis		xx	XX
5	Cost Analysis		xx	XX
6	Performance Analysis		xx	XX
7	Breakeven Analysis	XX	xx	
8	Market Segmentation Analysis	XX	xx	
9	Values and Lifestyle Analysis	XX	xx	
10	Proforma Analysis	XX		XX
11	"What If" Analysis	XX	xx	
12	"Goal Seek" Analysis	XX	xx	
13	Regression Analysis	XX	xx	
14	Product Lifecycle Analysis	XX	xx	
15	Product Portfolio Analysis	XX		XX

Index:
XX   Used Heavily
 X   Used moderately

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