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ONLINE MARKET TEST LABORATORY WITH THE MINISIM*
PROGRAM

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ABSTRACT

The Online MINISIM after-the-fact market test laboratory enables competing participant teams in the marketing simulation COMPETE to simulate different marketing mixes. Participants with Web-access order MINISIM for a specific decision period. They receive the necessary files via e-mail after the simulation is administered. The MINISIM program automatically uses the team's original decisions for the current period. The team can change and modify one or more of their original decisions to test their effect on such performance measures as market share and profits. The MINISIM program then runs the COMPETE simulation with the new decision inputs. The test results are displayed on the computer screen and written to a text file.

INTRODUCTION

The MINISIM program enables competing participant teams in the marketing simulation COMPETE to simulate different marketing mixes and serves as an after-the-fact market test laboratory. Participants can experiment with changed input values for the period to test the effect of these changes on such performance measures as profits, market share and cash flow. These experiments enhance their understanding of individual and joint marketing response (Gompertz) functions.

Differences among team members as to price, advertising budget, media emphasis, advertising message emphasis, etc., can be tested by running MINISIM with different values under controlled conditions. The teams are permitted to vary the major demand and supply effecting factors or variables such as price, shipments, salesforce, advertising, and R&D for their own company. They are not permitted to examine or modify competitor decisions or to purchase additional marketing research reports. In addition, they are not permitted to examine or modify simulation parameter, history or other data files.

The competing participant teams are reminded that changes in R&D investments, the number of sales people, or sales force compensation have no sales or market share

effect for the current simulated period since there is a lagged effect until the next period built into the model. However, the cost will be affected. In addition, they are advised to plan their experiment (i.e. change price in a specific market by plus or minus 10% to test the effect on market share and EPS), and to change the variable(s) whose effect they want to evaluate during the simulation run.

The MINISIM decision entry program automatically uses the team's original decisions for the current period. The team can change and modify these original decisions to test their effect on such performance measures as market share and profits. The COMPETE simulation will run with the new inputs, and the modified performance results are displayed on the computer screen and written to a disk file.

The MINISIM after-the-fact market test laboratory is used in conjunction with the Multiple Regression Analysis Data Matrices package (Palia, 2004). First, participants use the MINISIM program during the simulation to understand the impact of changes in such decision making variables as price, advertising budget, advertising media emphasis, advertising copy emphasis, and shipments on team performance measures such as profits, market share, and cash flow. Later, when sufficient data on past decisions are available to provide adequate degrees of freedom, participants use the Multiple Regression Analysis Data Matrices package (Palia, 2004) to apply their knowledge of multiple regression analysis (Freund & Williams, 1977; Lilien & Rangaswamy, 2003; Neter & Wasserman, 1974; Pfaffenberger & Patterson, 1977; Tatsuoka, 1971) in sales forecasting (Enrick, 1969; Makridakis, Wheelwright, & McGee, 1983; Willis, 1987) to build a linear unrestricted single-equation multiple regression model for each of the 9 SBUs in order to predict sales.

The primary purpose of this paper is to present this new user-centered learning tool that helps to prepare students for sales forecasting and marketing decision-making responsibilities in their future careers. The objective is to provide participant teams the opportunity (1) to plan, implement, and control a marketing program for their products and (2) to use an after-the-fact market test laboratory and multiple regression analysis to better forecast

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sales in a dynamic, complex and uncertain simulated competitive environment.

SALES FORECASTING

A major responsibility of marketing is the preparation of sales forecasts. First, market opportunities are identified through marketing research. Then, the size, growth and profitability of each market opportunity are measured and/or forecasted. Sales forecasts are used (a) by finance to raise the needed cash for investment and operations, (b) by manufacturing to establish capacity and output levels, (c) by purchasing to acquire the necessary supplies, and (d) by human resources to hire the needed workers (Kotler, 2003).

Accurate sales forecasts facilitate effective and efficient allocation of scarce resources. Over-estimates of demand lead to several problems. First, excess inventory uses up valuable shelf space and leads to obsolescence. Next, scarce working capital blocked up in inventory carrying charges [funds used or borrowed (a) by manufacturers to produce goods, or (b) by retailers to purchase goods] cannot be used for other purposes such as R&D or promotional expenses. Third, storage charges are incurred to store excess inventory in public or private warehouses. Finally, margins are reduced when excess inventory is removed through end-of-year clearance sales.

Under-estimates of demand lead to a different set of problems. First, stock-outs lead to wasted shelf space. Next, insufficient inventory leads to lost sales and consequent lost margins. Third, failure to keep up with customer demand may necessitate the use of limited and expensive overtime production leading to lower profitability. Finally, and most importantly, the firm may lose customers, when prospects facing an empty store shelf, try an alternative brand or go to an alternative store, and are satisfied by the competitive offering. Given the detrimental impact of inaccurate forecasts, marketers use a variety of sales forecasting techniques in order to forecast sales accurately (Palia, 2004).

SALES FORECASTING TECHNIQUES

Marketers forecast sales by (a) extending past behavior, and/or by (b) predicting future behavior. Extending past behavior techniques are applied when past sales data are available. These techniques tend to be more quantitative. They extend past data into the future, and assume that the future will be like the past. These techniques include trend extension, the factor method (using one or more factors such as the Buying Power Index, and the SIC code to forecast the sales of industrial products), time series analysis, the use of leading series, and indices such as the consumer price index, producer price index, and the index of leading economic indicators (McCarthy and Perreault 1987).

Predicting future behavior techniques do not rely on the availability of past data. Instead, they rely on judgment, and are used when there are changing conditions in the marketplace or changes in the marketing mix used. They

are also used to forecast the sale of unstable (fashion) goods and new products. These techniques include the Jury of Executive Opinion, salespeople's estimates, surveys of final buyers, retailers and/or wholesalers, panels of stores and/or final consumers, market tests of existing products, test markets of new products, the substitute method, and needs analysis (Perreault and McCarthy 1996). There is no best method of forecasting in all circumstances. Confidence in the accuracy of sales forecasts is derived by corroborating the results using two or more methods (McCarthy and Perreault 1984).

MARKET TESTS

A market test of an existing product is a controlled experiment that is designed to test the impact of a change in one or more of the elements of the marketing mix on the sales of an offering while holding all other elements of the marketing mix constant. For instance, AC Nielsen used split-cable television advertising to expose targeted households in Springfield, Illinois equipped with a special antennas and people meters atop their television sets to test advertisements of specific products. Individuals watching television use a remote control to register themselves with on-screen prompts periodically.

The data on viewer watching habits is electronically uplinked to the AC Nielsen computer on a daily basis. Individuals in these targeted households are exposed to special test ads that differ from the normal television ads broadcast to other households in the neighborhood. Later, individuals use a special AC Nielsen shopping card when they shop at the neighborhood store. Their purchases are logged in to the computer and correlated with the test ads watched. All other elements of the marketing mix such as price, coupons, other elements of the marketing mix are held constant in order to test the impact of the test ad on the purchase behavior of the test household.

The MINISIM program is an after-the-fact market test laboratory that enables participants to test the impact of changes in one or more of the marketing mix decisions on their performance, while holding all other things such as simulation parameters, other elements of the marketing mix and competitor decisions constant (*ceteris paribus*).

THE MARKETING SIMULATION COMPETE

COMPETE (Faria, Nulsen, & Roussos, 1994) is a widely used marketing simulation designed to provide students with marketing strategy development and decision-making experience. Competing student 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 student teams plan, implement, and control a marketing program for three high-tech products in three

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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 measurable company goals are set, and marketing 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 74 marketing decisions with regard to marketing their three brands in the three regional markets. These decisions include nine pricing decisions, nine shipment decisions, three sales force size decisions, nine sales force time allocation decisions, one sales force salary decision, one sales force 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 require that each company constantly monitor trends in its own and competitive decision variables and resulting performance.

COMPETE ONLINE DECISION ENTRY SYSTEM (CODES)

The web-based MINISIM program is accessible online to competing participant teams in the marketing simulation COMPETE. The teams log in to the COMPETE Online Decision Entry System (CODES) website (Palia and Mak 2001, Palia et al 2000). Their login is validated against a database of participating teams for each industry, and they have access to their decisions and printouts (results) for all prior decision periods.

Once the team ID and password are validated against a database of participating teams, the user (participant) is presented with a personalized Welcome screen with several options. In addition to the "Main Menu" option, the user is presented with one or more of three dynamic links "Grades," "Handouts," and "Performance" only if and when the corresponding files are uploaded to their industry folder on the web server by the administrator.

The "Grades" option, when selected at the Welcome page, takes the user (participant) to a comprehensive updated grade sheet which indicates their score on each assignment as well as their cumulative score relative to other class members. The cumulative scores are reported on an absolute as well as percentage (of the completed assignments) basis. Descriptive statistics for each assignment such as the count, high, low, average, and standard deviation of scores are reported.

The "Handouts" option takes the user (participant) to a comprehensive handouts repository which includes all class handouts such as the course syllabus, course schedule, grading sheets for each assignment, PowerPoint handouts (1, 2, 3, 4 and 6 slides per page options) that are sorted

chronologically by class meeting for the entire semester. The user can select, view, and print the desired version of the handout. The 6 slides per page option saves paper. The 3 slides per page option provides space for note-taking during the presentation. The 1 slide per page option enables the user to select (cherry pick) and print detailed (busy) individual slides.

The "Performance" option takes the user (participant) to a comprehensive cumulative team performance ranking at pre-selected milestones during the simulation competition. Each team is provided with a cumulative ranking on 18 performance criteria in the Excel version of the simulation results printout every decision period (Palia 2005). These criteria include 6 profit criteria, 3 market share, 3 quality and 3 cost-of-production criteria by product, and 3 efficiency criteria. Prior to the start of the competition, the teams decide by consensus (or majority vote) the frequency of access to the cumulative team performance ranking (via CODES). All teams decide whether to access the cumulative team performance ranking every decision period (3 months), every two decision periods (6 months), or every four periods (12 months). They assess the added benefit of learning about the relative strengths and weaknesses of each competitor against the added cost of revealing their own relative strengths and weaknesses to their competitors.

At the "Main Menu" webpage they select "Enter Decisions" to enter their team decisions prior to the decision deadline. At the decision deadline, the administrator downloads the team decision files, runs the simulation, and uploads the text and Excel versions of the simulation results to the Web Server. Later, the teams log in to CODES, proceed to the Main Menu, and select "View Results" to view their team performance results in either text or Excel format.

MINISIM

After analyzing their performance results, the teams can use the MINISIM program as an after-the-fact market test laboratory to simulate different marketing mixes. They can test differences among team members to price, advertising budget, media emphasis, advertising message emphasis, etc., by running MINISIM with different values under controlled conditions. These experiments to test the effect of changes in input values for the period on profits, market share, cash flow and other performance measures enhances their understanding of individual and joint marketing response (Gompertz) s-shaped functions that reflect diminishing returns to scale.

First, they use a web-based MINISIM Order form on the course homepage to place an order for MINISIM for a specific period prior to the decision deadline for the period. At the decision deadline, the administrator charges the concerned team/s \$150,000 for the MINISIM program, and runs the COMPETE simulation. Then, the administrator uses the COMPETE program to prepare the MINISIM folder with all the necessary files. Next, the administrator adds a batch file that permits the user to run MINISIM from

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any drive (hard disk, floppy drive, thumb drive,...). Finally, the administrator zips and names the folder MINISIM Cx Dy (where C is the indy letter, x is the company number, D=decision, and y is the decision period), and sends the zipped MINISIM folder via e-mail distribution list to all team members.

On receipt of the zipped MINISIM folder via e-mail from the administrator, the individual team members save and unzip the MINISIM folder to either their hard disk, 3.5" disk, thumb drive, or other media. Then, they open the MINISIM folder and click the MINISIM.bat file to start the MINISIM program. The recommended procedures to order and use MINISIM are posted on the web-based MINISIM order form as well as the MINISIM webpage on the course website.

The distribution of the zipped MINISIM folder via e-mail team distribution lists is more efficient and convenient (especially for executive and part-time students) than giving a 3.5" disk to a team representative. The ability to run MINISIM from any drive is another substantial improvement as most participants do not use 3.5" disks or have computers equipped with a:\ drives.

The teams are permitted to vary the major demand and supply effecting factors or variables such as price, shipments, salesforce, advertising, and R&D for their own company. They are not permitted to examine or modify competitor decisions or to purchase additional marketing research reports. In addition, they are not permitted to examine or modify simulation parameter, history or other data files.

The competing participant teams are reminded that changes in R&D investments, the number of sales people, or sales force compensation have no sales or market share effect for the current simulated period since there is a lagged effect until the next period built into the model. However, the cost will be affected. In addition, they are advised to plan their experiment (i.e. change price in a specific market by plus or minus 10% to test the effect on market share and EPS), and to change the variable(s) whose effect they want to evaluate during the simulation run.

CONCLUSION

The MINISIM program is a user-centered learning tool that helps to prepare students for sales forecasting and marketing decision-making responsibilities in their future careers. They use the MINISIM after-the-fact market test laboratory to simulate different marketing mixes, and to test the effect of these changes on such performance measures as profits, market share and cash flow. These experiments enhance their understanding of individual and joint marketing response (Gompertz) functions.

The online ordering and distribution of the MINISIM program is more efficient and convenient than giving 3.5" disks to team representatives, and exchanging disks for subsequent team MINISIM orders. The ability to run MINISIM from any drive (hard disk, thumb drive,...) by the addition of a MINISIM.bat file facilitates its use by

participating teams. The online MINISIM after-the-fact market test laboratory facilitates the integration of computers, the Internet and the World Wide Web into the marketing curriculum.

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