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COMPUTYPE: A STRATEGIC MARKETING GAME

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ABSTRACT

COMPUTYPE is a new computer simulation designed to teach marketing strategy to Commerce undergraduate or M.B.A. students. The game lasts for the equivalent of ten calendar years, and during that time, the four market segments evolve considerably. The scenario encourages students to think and plan on a long-term basis. COMPUTYPE's second objective is to be "user friendly" for the game administrator. It runs quickly on a standard IBM PC, and includes a "what-if" program for the professor to easily assess the impact of student errors. This paper describes COMPUTYPE's pedagogical and administrative aspects, and reviews its first classroom use.

INTRODUCTION

COMPUTYPE is a new computer simulation designed to teach marketing strategy to Commerce undergraduate or M.B.A. students. The game lasts for the equivalent of ten calendar years, and during that time, the four market segments evolve considerably. Companies must plan a strategy that will satisfy the changing needs of each segment while meeting the competitive tactics of the other firms. The scenario encourages students to think and plan on a long-term basis. This paper describes the pedagogical and administrative features of COMPUTYPE, and discusses its use.

WHY ONE MORE MARKETING SIMULATION?

Existing marketing games have not adequately resolved the dilemma of "user friendly" simplicity versus rich interesting complexity. A computer simulation is, by definition, a completely new world, one in which the participant has not had the benefit of twenty-odd *years* of socialization. The student must learn to function in a new environment. The administrator must not only understand the simulation, but must also incorporate the pedagogical and administrative aspects of the game into a marketing course.

Games such as MARKETING IN ACTION, [5] and PAINTCO [3] avoid the problem of complexity by reducing the simulations structure to the simplest level possible. The student is faced with a situation that is easy to learn, but which, after the first few periods, can become monotonous. At the other end of the spectrum, games such as THE MARKET PLACE [2] or MARKSTRAT [4] which have a more sophisticated environment, suffer from their complexity. Students and administrators can find the start of the game confusing and threatening and, as a result, can make many errors. This confusion, both in the installation and in the operation of many computer simulations, is probably the main reason that so few teachers use them.

COMPUTYPE is designed to provide a rich and interesting environment, but a special effort is made to keep it straightforward and logical for student and instructor. It incorporates special error-checking procedures to catch improper data entries. It also provides a "what-if" program

with which to modify and rerun a prior period of the game, to see what would have happened had a team of students made a different decision. This feature is particularly important if a team makes an error that might remove it from content-ion for the rest of the game. In two minutes with the "what-if" program, the administrator can calculate the cost of the error and, if desired, can give a cash credit to the team.

COMPUTYPE SCENARIO

A computype is a new product combining a personal computer and printer in one small, portable package. A low power computype is similar to an electronic typewriter, while a high power one has features comparable to the best word-processing systems available today, with the latest in laser printing technology as well as spelling and syntax checking software. A second differentiating attribute is design. As in many new markets, price is not initially as important as power and design.

In the COMPUTYPE world there are five companies, each producing and selling two brands. Teams have the ability to develop and sell new computype models to satisfy different markets. Four main consumer segments exist: secretarial, professional, student and general. Each segment has different product preferences, media habits, and shopping habits which can be determined from market research studies.

The game functions in a logical, realistic manner. Demand for computypes is initially a function of the general state of the economy, and secondly, a function of the product life cycle for each specific segment. Increased advertising exposure, lower prices, or more suitable products will increase the number of purchases within a segment. Because of the competition, the five companies are faced with conventional oligopolistic kinked demand curves, with the additional feature that consumers become suspicious of prices that are too low. Demand still increases, but at a decreasing rate as the price drops below what people believe possible.

Consumers behave as one would expect. An individual becomes aware of various brands through advertising. His or her perception depends not only on the actual attributes of the brand, but also on prior perceptions and on the advertising message used. Preference for a brand is a function of its perceived power, style, and price, compared to the ideal sought by that segment of the market. When a consumer decides to purchase a computype, his or her shopping habits determine the stores visited. If the most suitable brand is not available in the store, the buyer will take the next best.

All firms have the same technology available and all can invest in improving the production efficiency for any of their products. A model can have its variable production cost reduced by 30% or 50% depending on the amount of investment. New models may also be

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created. As one would expect, development costs are a function of the attributes requested and the similarity of the new product to those already developed. There is a time lag and a high degree of cost uncertainty in the creation of new models, but the actual procedure required by a student is very straightforward.

Price and product have been discussed above. COMPUTYPE deals with the remaining aspects of the marketing mix in a logical manner. In promoting a product, companies have a choice of media, and message, as well as being able to vary their budget for each brand. Distribution can be through three possible channels. Buyers in the four market segments have different behavior patterns, and this information is available in a series of market research studies.

The market research has a feature that is unusual in a game, but normal in the real world. Teams have the option of purchasing more or less accurate studies. All have a significance level of 0.05, but the students specify the error range required in the research and are charged accordingly.

The market research studies available are:

1. Forecasts of economic growth and segment growth.
2. Advertising expenditures per company per media.
3. Media reach per media per segment.
4. Awareness per brand per segment.
5. Estimates of actual and perceived product attributes.
6. Estimates of ideal product profiles for each segment.
7. A perceptual map showing product position and preference.
8. Purchase intention per brand per segment.
9. Salesmen per channel per company.
10. Number of accounts carrying each brand per channel.
11. Channel patronage per segment.
12. Sales per brand per segment.

The accuracy of the forecasts available in the first study declines as one looks further into the future. For example, if a company purchases a forecast that is accurate to within ten percent for the first year, the second year would have an error range of twenty percent, and the eighth year would have one of eighty percent.

In addition to the market research studies, four test markets are available for advertising and salesforce experimentation. For example, one can request an experiment in which ones advertising is doubled and see what would have happened to brand awareness. The salesforce experiment varies the number of salesmen and projects the impact on the number of accounts per brand.

As in the real world, the effects of changes in advertising and salesforce allocation are very difficult to determine. Brand awareness is based not only on advertising exposure, but also on the prior brand image. There is also a similar lag effect in the markets reaction to a change in the number of salespeople. A new salesperson must become familiar with a new territory and product range, while the accounts served by a departing salesperson continue to repurchase the same brands for a while without any direct sales effort.

Sales allocation must consider not only this lag effect, but also hiring and training costs, and the number of brands a salesforce should carry. If a salesperson handles more brands, he or she is more cost efficient due to the higher proportion of selling time versus travel time. On the other

hand, if the store purchases very few of the extra brand, the marginal benefit might still be negative.

A final complication is the old familiar problem of reliability versus validity. A request for a more accurate forecast causes a larger sample to be tested; it does not make the study any more valid. Obviously, if conditions change, the study's findings can no longer be trusted. For example, if advertising to segment three increases, or if more appropriate brands are introduced, student sales will be higher than forecast.

Market research results, annual financial reports, and production statistics are provided each period for each company. Aside from the production quantity decision, the computer does all of the non-marketing work. For example, if a company decides to increase production, financing is arranged, and new plant and equipment is built automatically. The resulting interest charges, and depreciation expenses are also computed.

COMPUTYPE does not have any budget constraints for the companies. This may not appear realistic, but there is a pedagogical reason for the omission. In MARKSTRAT a company's budget grows as a function of its profitability. The problem with this is that if a company gets off to a slow start, it does not have the financial strength to carry out the aggressive catch-up strategy that might be required. Pedagogically, all teams should have the opportunity to compete actively. To avoid the astronomical promotion strategies that might result from unlimited budgets, COMPUTYPE response functions are designed with a definite saturation level, after which further increases in expenditure are completely wasted.

COMPUTYPE sounds complex, but the student commences at a relatively simple level. Before the game, students are given an explanatory lecture, formed into teams of 2 to 5 students, and asked to read the 25-page student manual. The teams then receive the results from period zero when the five companies were formed and had their first year of sales. All teams start with two identical brands, differing only in name. Firms are advised to be conservative and are not allowed to start any research and development projects for new products until the second period. The initial periods results do not provide any information on media reach, or on channel patronage, and the students are advised to leave them as they are.

In period two the teams can start to develop new products, allocate media space, and specify promotional messages, but they are still limited to two brands. In period three they can introduce new brands, and they also have to present a short strategic plan. As an example, the Appendix lists one of these reports from an undergraduate policy course. At the end of the game, the teams are again expected to do a report on the strategy they used, and on what they would plan for the future.

ADMINISTRATIVE FEATURES

COMPUTYPE runs on an IBM PC, AT, or compatible computer with 256K of memory and one floppy disk drive. A second drive eliminates the need to switch disks, or if one prefers, the game can be installed on a hard disk. A batch file is provided for the installation procedure. The programs and files come on one floppy disk, and files for five complete games

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can be stored on a second disk.

COMPUTYPE can be played with multiple sections of five companies. In each section the game evolves in a unique manner, partly because of different student inputs, and partly because a different random number seed is used. If the game is played several times, each section will be sufficiently different to require various strategies for success. It is possible, however, to alter the game parameters to further differentiate between sections, or for your own specific pedagogical purposes. For example, one might wish to increase the emphasis on the salesforce relative to advertising.

Game inputs can be done in three ways. The student can hand in the decisions on a form for the administrator to enter. Alternatively, students can be given their own disks with the input program and allowed to type in their own decisions. The latter is easier, and also eliminates the awkward problem of the administrators making an error entering the student data. The third method is to install the mainframe version of the input program on a time-sharing system and let the students enter their decisions in that manner.

Error handling is a major concern in playing a computer game. Some protection is provided by having strict ranges for decisions, and having an input program that informs the student when illegal data is submitted. A second technique is to try to simplify decision entry. For example, the computer procedure should look as similar as possible to the printed decision form. It is advantageous if the prior periods inputs are displayed during the data entry procedure with only the changes requiring further typing. If an error occurs in spite of all these precautions, the administrator can use the "what-if" program to determine its effect.

The time taken to run a computer game is a serious consideration for the administrator. It includes not only the actual running time, but also the hours spent learning and installing the game, and then the additional time spent correcting the inevitable problems. COMPUTYPE takes a few minutes to install, one minute to run, and perhaps fifteen minutes to print the results with a small dot-matrix printer. The "what-if" procedure lists the results on the screen, and so only takes two minutes.

A summary description of COMPUTYPE in a classroom situation is provided in Table 1 below. The categories were developed by Richard D. Nordstrom, and published in the ABSEL 14th Annual Conference Call for Papers. The table describes the use of COMPUTYPE in a 13-week undergraduate policy course. In addition to the game, the students had marketing cases to discuss and submit.

TABLE 1

REVIEW OF COMPUTYPE USING ABSEL GUIDELINES

Details of Class Organization

- a. **Class Size:** 10 students & up.
- b. **Number of sections:** Unlimited.
- c. **Size of team or group:** From 2 to 5.
- d. **Length of class in minutes:**
The game runs for 10 periods, each requiring from 30 to 150 minutes of preparation but it need not be in class.
- e. **Rotation of Assignments:** Weekly.

- f. **Timing of Assignments:** Weekly decisions.
- g. **Student background:** M.B.A. or Undergraduate marketing policy course.
- h. **Timing of reports:** After per. 2 & 10.
- i. **Nature of "class discussion":**
Marketing strategy implications should be discussed in class, and integrated into the course.
- j. **Administrative support needed:**
One hour per section of 5 teams with an I.B.M. PC or compatible, and a dot matrix printer. Half that if the students can enter their own decisions.

Details of Feedback or Mechanisms for Debriefing

- a. **When does the debriefing take place?**
During a special class after the end of the game.
- b. **How does the debriefing proceed?**
Each team makes a report to its "Board of Directors" (the class) explaining its past and future strategy.

Details of the Grading System

- a. **Is the project graded on letter grade or by assignment of points?**
By assignment of points.
- b. **What items are evaluated? How are they weighted?**
Team profitability generates a mark from 11% to 19% out of 20%, and the reports count for a further 5%.
- c. **What percent of total grade is assigned to this part of the course?**
25%
- d. **Is grading one part of debriefing?**
No, but students know all but their final report mark.
- e. **Is grading a one-time assignment or assigned in parts?**
Grading is based on three parts as described above.
- f. **Is the project subject to examination or quiz?**
Class presentation and discussion of final report.
- g. **Who grades?**
The instructor.

Details to Guide in Preparation for Class Use

- a. **How far in advance should a prospective user start to get ready to use the exercise?**
Computer program and text must be obtained from author.
Familiarization and set-up time is less than a day.
- b. **How much time does each part or phase require?**
90 minutes class time to explain game and form teams.
30-150 minutes meeting time per decision for the teams.
90 minutes per section of 5 teams for debriefing.
- c. **What resources are useful?**
Access to microcomputers for students.
- d. **Can a person do this alone or is it wise to get some help from other faculty or the business community?**
Instructor can run COMPUTYPE alone if he or she has a basic level of familiarity with a microcomputer.

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- e. Based on your knowledge and experience in using this exercise, what can be done to avoid errors?
Go over the student input with each team as it is collected.
- f. Are there any modifications that might be worthy of consideration?
A program to allow students to run "what-if" scenarios with different inputs and response functions.
- g. How long does it take to grade the work?
One hour per team to grade the reports.

Your Experience With Game Or Exercise

- a. Number of uses: Two.
- b. Do you intend to use it in the future? Yes.
- c. What are its learning objectives?
COMPUTYPE is designed to teach a student to work as part of a team to develop and operate a marketing strategy. The different aspects of the marketing mix must be integrated, and vigorous competition must be dealt with.
- d. Is it effective?
COMPUTYPE appears to be effective. It generates enthusiasm within the class, and the reports received to date suggest that the students are gaining an appreciation of the way in which to plan a marketing strategy.

CONCLUSIONS

COMPUTYPE is a new marketing simulation designed to teach marketing strategy to M.B.A. or final-year undergraduate commerce students. In the example described above it was played over 11 weeks in conjunction with a marketing policy course, but it might also be used in an intensive two-day session.

COMPUTYPE provides a ten-year competitive scenario within which to develop and apply marketing strategy. Student teams are intentionally forced to concentrate on a long-term strategy, while at the same time minimizing the confusing complexity that is all-too-often present in games of this type. "User friendliness" has become a hackneyed term, but it is a concept that is particularly relevant to a pedagogical computer game. How successfully COMPUTYPE achieves its objectives will only be determined through further use. The early classroom results are encouraging. The general atmosphere of the game, and some evidence of effectiveness can be inferred from the previously-mentioned student report reprinted in the following appendix.

REFERENCES

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[5] Ness, Thomas E. and Ralph L. Day, Marketing in Action: A Decision Game. 4th ed. (Homewood Illinois: Richard D. Irwin, 1978).

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APPENDIX

Student Marketing Plan [1]

Company B-4, last years leader in the computype industry - with a market share of 25.5% - is entering its third year of operations. The purpose of this report is to outline the marketing strategy developed to achieve the firms objectives of attaining the highest profitability in the industry and maintaining its leadership position.

Target Market

Presently, the firm is concentrating its efforts on secretaries and professionals (Segments 1 & 2 respectively) for they are the most profitable. However, projections show that Segments 3 & 4 (students and the general public) will grow rapidly in the future. Accordingly, our long-term objective is to capture a greater share of these market segments.

Product

Our product line presently consists of two models: Fastype (low power, high style) which is aimed at professionals, and Widget (high power, low style) which is aimed at secretaries. Research and development is being conducted in order to determine the feasibility of launching a third model targeted towards Segment 4, the general public. This new model which will be characterized by medium power and style, is designed to fill this existing market gap.

Price

The market is in the growth stage and as a result, price is not an important attribute to the consumer. Instead, the consumer is more concerned with power and style. Our prices are competitive, yet they are above the perceived ideal. The rationale is that although our lowered production costs would enable us to charge lower prices, consumers may grow suspicious of such prices (i.e. lower prices imply poor quality machines). Hence, we will maintain our present policy of pricing our products competitively, and above the perceived ideal. (It should also be noted that annual adjustments for inflation will also be incorporated into our prices).

Promotion

Our advertising strategy will focus on increasing brand awareness through higher advertising expenditures. We will continue to advertise in all five media, although we will select the most effective medium for each particular market segment (i.e. the medium with the highest reach per segment). The sales force will be used to its maximum efficiency through allocating a proportional number of salespeople to the channels where they are most needed. As sales increase, more salespeople will be hired.

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Place

All three channels of distribution will be employed. Through market research it was determined that different segments have different channel patronage. Thus, our products will be allocated according to the sales and demand in each channel.

Notes:

1. We will continue to strive for maximum efficiency in our product operations by investing in equipment improvements. As a result, our contribution margins will increase, and as sales increase, our break-even volume will decrease.
2. Market research will continue to play an integral role in making decisions and modifications in our marketing strategy so as to accomplish our goals.