

Insights into Experiential Pedagogy, Volume 6, 1979

THE DYNAMIC ASPECTS OF INTERACTIVE GAMING PUTS THE REALISM INTO GAMING

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INTRODUCTION

Instructors in the academic disciplines of Commerce, Economics and Business Administration have attempted for many years to bring realistic business episodes into the University classroom. One of the first successful attempts was at The Harvard Business School in 1909, by Doc" Copeland with the most widely used methods to teach business courses, The Case Method. (4). Computer simulation and gaming is considered the next major advance of bringing realism into the classroom. This method has many known advantages, but business games have often frustrated the game administrator with their specific amount of required decisions needed to be punched without errors each fixed time period. (3).

The next advance at bringing realism into the classroom to business students follows a technological advance in computer ability. The advent of the interactive terminal enables the instructor to offer students a dynamic simulation without a fixed time period or a specific amount of required decisions. An interactive gaining technique which satisfies this freer format is the Interactive Case. (2)

The Interactive Case (I.C.) offers a more realistic environment than business games because students are able at any time in the simulation to change their input variables without waiting until the next fixed time period. This is possible for the student because of the time sharing capabilities of the interactive terminal. To students it appears that their requests are instantaneously answered; in reality, however, the main computer has probably answered a dozen or more requests to other interactive terminal users. The time frame for the interactive case is therefore very flexible allowing students to change variables whenever they wish, for example, at 1.7 weeks, 3.2 weeks or even .2 week intervals in simulation time. This simulation time could correlate directly to the wall clock time of 1.7 minutes, 3.2 minutes and .2 minutes. Unlike business games, the Interactive Case, does not require a specific amount of input variables due each time period. Thus, students can change one variable, some, all or none (the let it ride strategy) whenever they choose. Some of the headaches and frustrations for the game administrator of incorrectly punched student inputs are also eliminated since students are able to instantly correct any input data incorrectly punched.

THE INTERACTIVE CASE (1).

The Interactive Case method is the computerizing of a case on a computer terminal. Participants of the Interactive Case receive the written portion of the case one week in advance of the computer interaction. This will enable participants to conduct research and gather information pertaining to the main problem and various subproblems as presented in the case. After a two hour session on a computer terminal, a

classroom discussion is scheduled. Students and the Professor then discuss during the next regular class meeting the learning objectives of a particular Interactive Case.

A simplistic flowchart of an Interactive Case developed by the author is presented in Figure 1. Attention should be focused on the free-flowing nature of the program. Game participants are freely able to seek out short and/or long-run information as well as modify decision input variables as needed. Some of the readers of this paper will undoubtedly notice the programming similarities in the Interactive Case and a game which many interactive terminal users have enjoyed, Star Trek.

THE SIMULATION

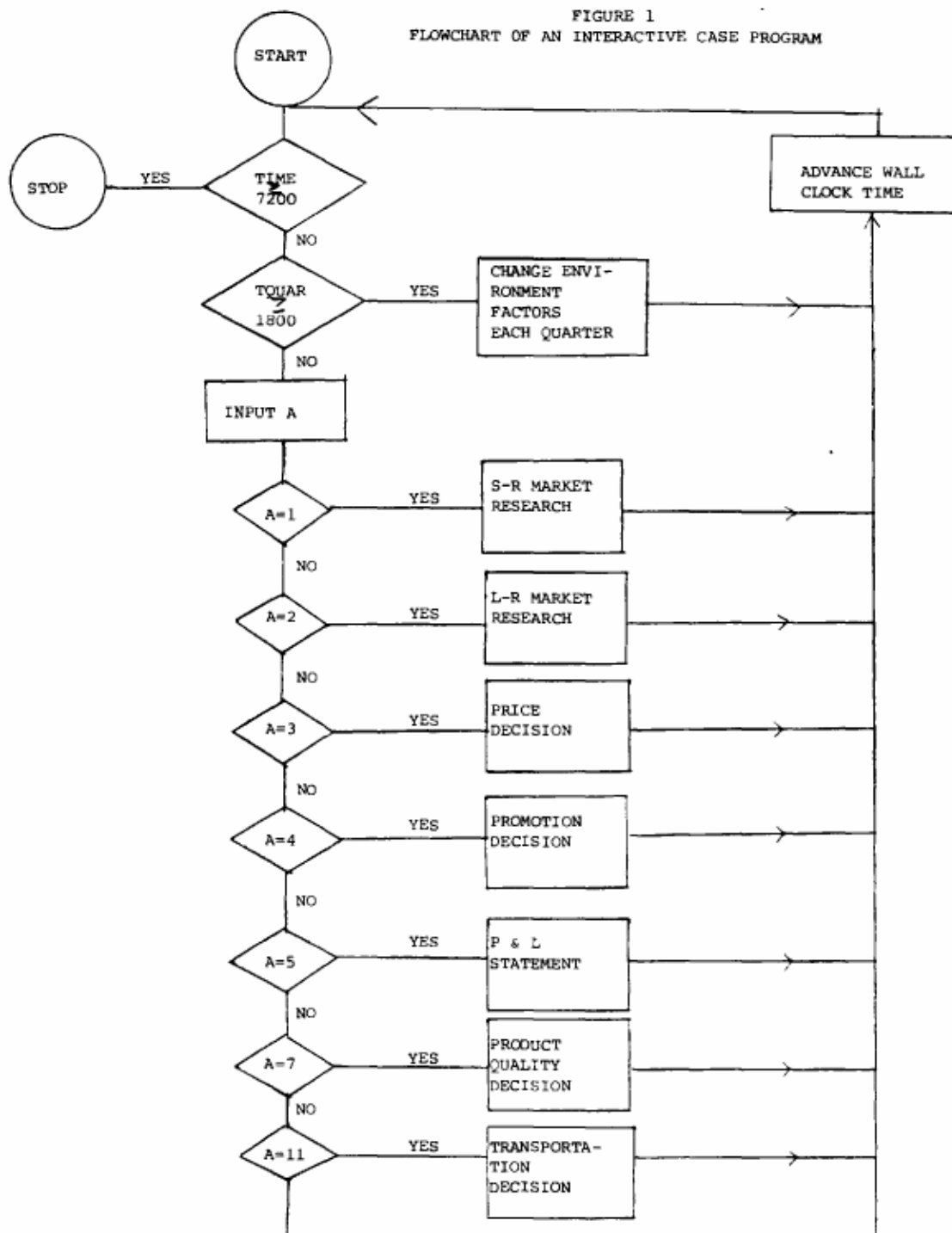
The I.C. is played on computer terminals by ten teams in direct competition with each other. Each team simulates the object system (a micro business environment) using basically the same computer program. The only differences in the ten separate programs are the file names where each individual team modifies and stores its own unique decision variables. Each team program also automatically calls a file which stores the sales figures, the profit amounts and the cumulative statistics. Each of these files has a secret password which calls the data files from the master storage discs. The players do not know and cannot obtain the scrambled nonsense names and passwords of their own data files or their competitors data files. In other words, the players of the simulation are only allowed to execute a system file which has in it the compiled program.

THE DYNAMIC ASPECTS

Ideally, all gaining techniques strive to Obtain a 100% realistic copy of the object system being simulated. One way to achieve this verisimilitude is to periodically change environmental factors affecting the simulation. Three actions capable of producing environmental changes in the Interactive Case are: (1) The long-run market research predictions and their resultant occurrences, (2) The short-run actions taken by competitors, and (3) The actions taken by the game administrator.

New long-run market research is typically available to participants on a quarterly basis. The long-run market research data is preprogrammed in advance and scheduled to be made available to players at the appropriate times by means of an elapsed wall-clock timing subroutine. Players obtain information and future predictions on events which will influence their profit performance on such uncontrollable factors as the product life cycle, future business cycles and proposed government legislation. Some of these environmental factors will occur deterministically in the simulation. The remaining environmental factors occur stochastically through the use of a Monte-Carlo

FIGURE 1
FLOWCHART OF AN INTERACTIVE CASE PROGRAM



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technique and pseudo random number generation.

The second dynamic environmental regeneration is caused by the short-run actions taken by the entire group acting collectively. The collective amounts selected for the advertising budgets, the pricing of the products and the various team levels of the product quality index influence the absolute amount of profit potential which can be realized. The short-run environmental change is implemented by the program and follows this sequence of (1) constantly monitoring all of the teams latest input files for the above mentioned variables, (2) substituting the new amounts in equations and subroutines, and then (3) reporting this new information to individual teams when so requested. The short-run actions taken by competitors is the most dynamic element in the Interactive Case. It allows the I.C. to be truly realistic since the players are really interacting with other competitors through the use of the terminals, the storage disc files and the main computer. The realism is analogous to playing the Star Trek game not just against the heuristically thinking computer but against persons using the terminals and interacting with you playing the roles of the Klingons and Romulins.

The dynamic nature of the first two environmental factors is illustrated in Report 1 which is a sample output of the program being run.

REPORT 1 SAMPLE COMPUTER OUTPUT OF AN INTERACTIVE CASE PROGRAM

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READY
-IC
HELLO-IT IS STARDATE      1.

YOU WILL HAVE UNTIL STARDATE 7200
TO RID THE GALAXY OF YOUR COMPETITORS
OR TO HAVE MORE MONEY THAN THEY
THE TEN COMPETITORS ARE:
1. ENTERPRISE
2. ROMULINS
3. STARFLEET
4. KLINGONS
5. QUARK
6. R2D2
7. VULCAN
8. BLACK HOLE
9. QUASAR NOVA
10. C3PO
YOUR TEAM NAME IS "THE KLINGONS"
MAY THE FORCE BE WITH YOU
THESE ARE THE COMMANDS
MARKET RESEARCH SHORT-RANGE=1
MARKET RESEARCH LONG-RANGE=2
PRICE=3
PROMOTION=4
PROFIT & LOSS STATEMENT=5
PRODUCT QUALITY=7
TRANSPORTATION=11
MAINTAIN POSITION=13
COMMAND
? 1
SHORT-RANGE MARKET RESEARCH
INFORMATION AVAILABLE IN THE FORM OF AVERAGE
MONEY AMOUNTS BY COMPETITORS
WHICH AREA DO YOU REQUIRE INFORMATION
PRICE=1, ADV=2, SALES=3, PROFIT=4, NONE=5
? 1
AVERAGE COMPETITORS' PRODUCT PRICE
      ALPHA      BETA      GAMMA      SIGMA      OMEGA
NE      24.      84.      34.      40.      8.
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SE      25.      86.      35.      10.      10.
MW      26.      86.      36.      20.      12.
SW      27.      86.      37.      50.      14.
W       28.      84.      38.      30.      16.
DO YOU NEED MORE INFO? YES=1, NO=2
? 1
WHICH AREA DO YOU REQUIRE INFORMATION
PRICE=1, ADV=2, SALES=3, PROFIT=4, NONE=5
? 2
AVERAGE COMPETITORS' PRODUCT ADVERTISING
      ALPHA      BETA      GAMMA      SIGMA      OMEGA
NE      200.      200.      200.      200.      200.
SE      200.      200.      200.      200.      200.
MW      200.      200.      200.      200.      200.
SW      200.      200.      200.      200.      200.
W       200.      200.      200.      200.      200.
DO YOU NEED MORE INFO? YES=1, NO=2
? 2
COMMAND
? 3
PRICE DECISION      PRICE CHANGE=1, PRICE INFORMATION=2
? 1
FOR WHAT REGION
NE=1, SE=2, MW=3, SW=4, W=5, ALL=6, NONE=7
? 1
FOR WHAT PRODUCT
ALPHA=1, BETA=2, GAMMA=3, SIGMA=4, OMEGA=5, NONE=7
? 1
NEW PRICE=
? 20
COMMAND
? 4
ADVERTISING DECISION      ADV,CHANGE=1, ADV,INFO=2
? 2
RATE OF ADV. EXPENDITURES PER 2 WEEKS FOR THE KLINGONS
      ALPHA      BETA      GAMMA      SIGMA      OMEGA
NE      200.      200.      200.      200.      200.
SE      200.      200.      200.      200.      200.
MW      200.      200.      200.      200.      200.
SW      200.      200.      200.      200.      200.
W       200.      200.      200.      200.      200.
COMMAND
? 5
STARDATE 153.      P&L STATEMENT
IT HAS BEEN 1.821 WEEKS SINCE THE LAST P&L
WHICH WAS AT STARDATE 0.
NE REGION ALPHA      BETA      GAMMA      SIGMA      OMEGA      TOTAL
PRICE      20.      84.      34.      40.      8.      282.
DEMAND      0.      227.      0.      0.      55.      19508.
SALES      0.      19068.      0.      0.      440.      8258.
CGS      0.      7931.      0.      0.      327.      1000.
FROM      200.      200.      200.      200.      200.      1146.
RETINV      101.      677.      102.      180.      86.      9104.
PROFIT     -301.      10260.      -302.      -380.      -173.
SE REGION ALPHA      BETA      GAMMA      SIGMA      OMEGA      TOTAL
PRICE      25.      86.      35.      10.      10.      242.
DEMAND      0.      175.      0.      27.      40.      15720.
SALES      0.      15050.      0.      270.      400.      6522.
CGS      0.      6118.      0.      161.      243.      1000.
FROM      200.      200.      200.      200.      200.      1188.
RETINV      104.      729.      102.      153.      100.      7010.
PROFIT     -304.      8003.      -302.      -244.      -143.
MW REGION ALPHA      BETA      GAMMA      SIGMA      OMEGA      TOTAL
PRICE      26.      86.      36.      20.      12.      337.
DEMAND      0.      262.      0.      19.      56.      23606.
SALES      0.      22532.      0.      380.      672.      9628.
CGS      0.      9177.      0.      116.      335.      1000.
FROM      200.      200.      200.      200.      200.      1096.
RETINV      108.      641.      102.      161.      84.      11860.
PROFIT     -308.      12514.      -302.      -97.      53.
ARE YOU READY FOR MORE INFO? YES=1, NO=2
? 1
SW REGION ALPHA      BETA      GAMMA      SIGMA      OMEGA      TOTAL
PRICE      27.      86.      37.      50.      14.      104.
DEMAND      0.      87.      0.      0.      17.      7720.
SALES      0.      7482.      0.      0.      238.      3161.
CGS      0.      3059.      0.      0.      102.

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FROM      200.      200.      200.      200.      200.      1000.
RETINV    112.      816.      102.      180.      123.      1333.
PROFIT    -312.     3407.     -302.     -380.     -187.     2260.
W REGION  ALPHA      BETA      GAMMA      SIGMA      OMEGA      TOTAL
PRICE     28.       84.       38.       30.       16.
DEMAND    0.       136.      0.       0.       23.       159.
SALES     0.      11424.      0.       0.       368.     11792.
CGS       0.      4759.      0.       0.       139.     4898.
FROM      200.      200.      200.      200.      200.      1000.
RETINV    116.      768.      102.      180.      479.     1645.
PROFIT    -316.     5697.     -302.     -380.     -450.     4249.
KLINGON TOTAL CASH=$      34483.
COMMAND
? 2
LONG-RANGE MARKET RESEARCH
IT IS STARDATE 310.
ALPHA IS STILL NOT READY FOR THE MARKET

ANOTHER COMPETITOR IS MARKETING A PRODUCT SIMILAR TO BETA.
THEIR PRODUCT, HOWEVER, IS FAR SUPERIOR THAN BETA.
BETA WILL BE ENTERING INTO THE DECLINE STAGE
OF ITS PRODUCT LIFE CYCLE MUCH EARLIER THAN
EXPECTED. SALES WILL DECREASE VERY RAPIDLY

GAMMA IS STILL BEING TESTED BY THE GOVERNMENT

SIGMA AND OMEGA ARE IN THE MATURITY STAGE OF THEIR PRODUCT
LIFE CYCLES, IT APPEARS THAT BOTH SIGMA AND OMEGA WILL HAVE
STABLE DEMANDS WELL INTO THE FUTURE
COMMAND
? 11
TRANSPORTATION DECISION      RATE CHANGE=1, INFO=2
? 2
CURRENT RATES OF TRANSPORTATION PER 2 WEEKS FOR THE KLINGONS
      ALPHA      BETA      GAMMA      SIGMA      OMEGA
NE         1.     1000.         2.       100.       50.
SE         5.     1000.         2.       100.       50.
MW        10.     1000.         2.       100.       50.
SW        15.     1000.         2.       100.       50.
W         20.     1000.         2.       100.      500.
COMMAND
? STOP
*TERMINATED*
READY.

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The third method to achieve realism is accomplished by the administrators direct manipulation of the sales and profit variables. For example, a situation could occur when the teams were not generating enough market potential to operate on a continuing basis. If a situation like this would occur the administrator could intervene and inject into the economy an environmental factor which would augment the available market potential.

SUMMARY

University instructors have continually attempted to bring the newest and most realistic teaching techniques into the classroom. A recent advance is interactive gaming which offers students a greater amount of realism than the prior business games. The dynamic aspects of interactive gaming which make for a realistic environment are: (1) The long-run changing market conditions, (2) The short-run interactions with competitors and (3) The manipulation of the economy by the game administrator. The Interactive Gaming Technique also referred to as the Interactive Case Method has been successfully used at Western Illinois University in the teaching of Marketing Management. This technique could also be used by other schools to update the computer realism in various Business Administration courses.

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