

Developments in Business Simulation & Experiential Exercises, Volume 17, 1990

SUGGESTIONS FOR COMPUTERIZED BUSINESS SIMULATION AUTHORS

William D. Biggs, Beaver College
Annette L. Halpin, Beaver college

ABSTRACT

The purpose of this article is to make Operationalizing computerized business simulations easier for the end user. To achieve this purpose suggestions are made for game designers and publishers to improve information provided to end users. The suggestions are primarily based upon the authors' experiences as they attempted to operationalized II computerized business simulations which are purportedly designed for courses such as Introduction to business, Business for Non-Business Majors, or Entrepreneurship.

INTRODUCTION ION

Almost from the time the first practical computerized business simulation was introduced by the American Management Association in 1956 (Meier, 1969) and the first such game was used in a college setting in 1957 (Watson, 1981 as cited by Whiteley and Faria, 1989), various writers have expressed concern about aspects of game design and game use problems. Fritzsche (1975), for example, identified four categories of problems associates with business games: (1) computer problems; (2) game problems; (3) student problems; and (4) collegial problems. Of these four categories this article primarily addresses the game problems which includes insufficient documentation and game tugs. Fritzsche (1975) used a questionnaire to elicit responses concerning problems individual instructors encountered as they attempted to use particular business simulations. In response to the questionnaire 23 of 52 respondents cited inadequate documentation as a problem they had encountered. In additional 29 of the 52 respondents indicated that they had experienced game bugs as they tried to use various games. Fritzsche (1975: 47) concludes:

Publishers and game authors could substantially reduce these difficulties by (1) improving the documentation supplied with games and (2) thoroughly testing a game before it is released to the market.

The authors are convinced that nearly 30 years after the introduction of business games and 14 years after Fritzsche (1975) made his observations, game designers are still negligent and sloppy in the information they provide to game users. Much of the problem still lies in inadequate testing of games prior to release and in inadequate documentation.

THE GAMES REVIEWED

The observation that adequate documentation and testing is not being done is based upon attempts to operationalized 11 computerized business games released between 1985 and 1988. The authors of these games claim they are designed for courses such as

Introduction to Business, business for Non-Business Majors, and Entrepreneurship. These games constitute a "new wave" of computerized business games in that they are designed for lower-level courses than other general management games and functional games as well as for audiences which have little formal business knowledge (Biggs and Halpin, 1989; Halpin and Biggs, 1989).

To be included for review a game had to be available from a commercial publisher. The authors contacted all major publishers by visiting booths at professional meetings and/or by letter and requested copies of any general management games which might be appropriate for courses such as Introduction to Business, Business for Non-Business Majors, and Entrepreneurship. In some instances were told that no such publications were available when in fact the authors were aware of their existence. In other instances follow-up letters were necessary since requested materials were not sent or only part of the necessary materials were received (eg., a student manual without disks and/or an instructor's manual). The 11 games which meet the criteria for course type and level of student and for which all materials were finally received are listed in Table 1. i

TABLE 1

Cotter, R.V. & Fritzsche, D.J. (1985) Modern Business Decisions. Englewood Cliffs, NJ: Prentice Hall, Inc.

Funk, J.A. E. Smith, W.A. (1985) Chairman of the Board. Chicago, IL: The Dryden Press.

Keys, J.B. & Wells, R. (1987) Microtronics, Inc. New York, NY: John Wiley & Sons.

Mills, L.W. E. McDowell, D.B. (1985) The Business Game. Boston, MA: Little, Brown and Company.

Ness, T.E. (1987) QSC Pizza Shoppe. Chicago, IL: The Dryden Press.

Penderghast, T.F. (1988) Entrepreneurial Simulation Program. San Diego, CA: Harcourt Brace Jovanovich.

Smith, J.R. (1985) Enterprise II. Boston, MA: Houghton Mifflin Company.

Smith, J.R. (1987) Manager: A Simulation. Boston, MA: Houghton Mifflin Company.

Smith, J. R. J.R. & Golden, P.A. (1987) Entrepreneur: A Simulation. Boston, MA: Houghton Mifflin Company.

Spero, L.L. (1988) Business Simulator. Cincinnati, OH: South-Western Publishing Company.

Whitney, Gary (1986) Boardroom. Dubuque, IA: William C. Brown Publishers.

Developments in Business Simulation & Experiential Exercises, Volume 17, 1990

The authors planned to run the games and review them using a learning model set forth by Keys (1976, 1980) and used by Keys (1987) to review computerized general management games by Biggs (1987) to review computerized functional games. It was anticipated that running the games would be relatively simple since both of the authors are somewhat computer literate and one of the authors has used, written, written about, and reviewed such games over the past 20 years. Unfortunately these expectations were not met. At the time of this writing only 7 of the 11 simulations have been operationalized and it has taken months to get to this point with major portions of weeks being spent on a single simulation.

THE MAJOR PROBLEMS ENCOUNTERED

Three major problems were encountered as the authors attempted to run the simulations: (1) inadequate testing of the game by the game authors and publishers before the game was made available; (2) inadequate and unclear instructions on the steps necessary to operationalized the games; and, (3) inadequate student manuals in terms of readability and clarity of rules. The sections which follow present examples of problems which were encountered although the specific simulation for a given problem is not identified.¹

Inadequate Testing of the Game

Two examples illustrate that there is inadequate testing before games are released to the marketplace. In one simulation it was relatively easy to get through the first few steps of the initialization process but then the program would not run. It was assumed that the simulation was okay and therefore continued attempts to run the simulation were made using different interpretations of the instructions. After three hours of trying different combinations unsuccessfully the game authors were called. One of the game authors asked which version was being used and when told said, "Oh, there were some problems with that version so went back to an earlier version." He sent the earlier version and the simulation was successfully run. With another simulation after the first few initialization steps the system would become catatonic and no further processing of the simulation was possible. Again a great number of hours were spent trying to find "the user error" before the publisher of the game was contacted. A conversation with a programmer from the company revealed the source of the problem. The game, as designed, could accommodate from 2 to 15 teams. However, the first release would not work if there were fewer than 8 teams. Since the authors only wanted to operationalize the simulation a maximum of 2 or 3 teams were all that were typically run in order to reduce the number of decisions which had to be made. The authors ended up highly frustrated and wasted a great deal of time because the game author did not test the limits which were supposedly set for the simulation.

Inadequate and Unclear Instructions

A variety of problems were encountered with the

instructions as attempts were made to initialize the simulations. One type of problem had to do with the required computer commands. For example, in one simulation the instructions were detailed but never indicated that the "LOAD" command was needed. In another simulation the user was told to use the "ASSIGN" command but no specifics were given. In some cases erroneous instructions were given. For example, in one simulation the user was told to be certain to put the quote mark around the "CC" in the run command when, in fact, the necessary letters to run the simulation were not CC. In addition, it was discovered that the quotes were not even necessary. In some instances, there was insufficient detail provided on the steps necessary to run the simulation. For example, not everyone will know that it is necessary to put a disk in the B drive. In one simulation the user is asked to compute a number of pieces of information and after the information is provided the simulation continues. At one point, however, the user is asked about the type of display for the computer being used but when the information is provided the simulation does not continue automatically as had previously been the case. It was discovered that the user must press the return key in order for the simulation to continue.

Inadequate Student Manuals

Many of the student manuals reviewed were difficult to comprehend and the authors are concerned that the audiences for whom these games are presumably designed (i.e., individuals with little formal business training) will become confused and frustrated. In some cases the rules of the game and the relationships in the game are not sufficiently clear. In one simulation there was no indication of the impact that advertising had on sales; in another no guidelines for demand were provided so in a trial run all firms lost significant amounts of money. For such an introductory audience it would seem to be desirable to at least give some information about such critical relationships. Part of the problem here may be that it is not always clear that the author has defined in his/her own mind the audience for whom the simulation is designed. To some extent this appears to result because the authors and publishers are trying to have the simulation appeal to as wide an audience as possible.

SUGGESTIONS TO GAME AUTHORS AND PUBLISHERS

Four suggestions are offered to game authors and publishers in order to alleviate the problems described above. While most of the suggestions are generalizable to any computerized business simulation, some are dependent on the audience level for which the simulations reviewed are designed (i.e., freshmen and students with very little business background).

First, it is obvious that game authors need to do multiple tests of any simulation before it is released. A useful approach would be to ask colleagues at other institutions to test the

¹ Even though one of the reviewers of the paper felt "naming names may not be a disservice at all," the authors do not agree and have elected not to relate a specific problem to a specific simulation.

Developments in Business Simulation & Experiential Exercises, Volume 17, 1990

simulation. They could be asked to do multiple periods, use different numbers of teams, make extreme decisions, etc. so a variety of conditions could be tested. It would also be desirable to pay students to find bugs. Computer science majors could be given the program and asked to follow the logic. Business and non-business majors could be asked to make extreme decisions to try to "blow up" the simulation. Game authors are also encouraged to use accepted test methodology for software design.²

A second suggestion to game authors is that they include complete instructions on how to operationalize the simulation. Such instructions need to cover one and two disk drive and hard disk drive configurations. It is increasingly important that local area network (LAN) configurations also be discussed. It appears that a relatively easy way to cover these different set ups would be to do a print screen of a successful run and write in returns and other control keys which do not get printed out. These pages would then be included as part of the instructor's manual. A potential user would then be able to follow in a step by step fashion the initialization instructions necessary to operationalize the game.

The third suggestion to game authors and publishers is that they pilot test the student manuals with students at the target level to be certain that it is useable by the intended audience. Again students could be paid to do such tests but here the emphasis would be on making reasoned decisions based upon their understanding of how the simulation supposedly operates. This testing would help insure that the student instructions are adequate before the simulation is released. These tests should also help to identify errors such as references to incorrect pages in the manuals.

Finally it is essential that game authors and publishers find a way to disseminate information regarding game software, student and instructor manuals and instruction changes after the game has been released. Publishers should keep a record of the names of those receiving simulation materials, the versions which were sent, and the dates of the mailings. Having this information available, publishers could make certain that users and potential users are notified of any updates.³ An alternative is to provide a phone number for the authors so that they can be contacted directly. There may be a considerable lag between when a potential user receives the software and when he/she attempts to use it so publishers cannot assume that the lack of recent inquiry indicates a lack of interest.

² The authors are indebted to an anonymous reviewer for suggesting the use of students to find bugs and the idea of using accepted test methodology for software design.

³ One of the reviewers asked if it is wrong for the publisher to place the burden on the consumer in terms of cost/benefit considerations. The authors believe the publishers do need to take on more responsibility in this regard and as latter comments will show it may even be in the publishers best interests from a cost/benefit standpoint.

CONCLUSIONS

It is clear from the previous comments that game authors and publishers are not doing an adequate job of testing, documenting, and insuring readability of their products before releasing them to the market. The sudden availability of the personal computer has probably contributed to the problem as authors and publishers attempt to get to the market quickly with a particular product. In the long run this approach will be self defeating because of the frustration which may develop on the part of potential users. Both authors of this paper are computer literate and favorably disposed toward computerized business games and both were enormously frustrated as they worked with many of the 11 simulations presented in Table 1. Clearly, potential users who do not have computer skills and who must be convinced that simulations are a useful form of pedagogy will quickly discard computerized business games of all types if they encounter the problems experienced by the authors. It may be that even "seasoned" users of simulations will become frustrated and reduce the extent to which they use simulations. Thus, game authors and publishers are acting against their own interests by inadequately testing, documenting, and insuring readability of their products. It is imperative therefore that game designers and publishers invest the necessary time and resources to insure a quality product reaches and continues to be available in the market place. The suggestions made in this paper will not resolve all the problems but they are important if we are to continue to attract new users to simulations as well as to retain current users.

REFERENCES

- Biggs, W.D. (1987) "Functional Business Games," Simulation & Games 18: 242-267.
- Biggs, W.D. and A.L. Halpin (1989) "A New Wave of General Management Games," Academy of Management, Management Education and Development Division Newsletter, November 1989.
- Fritzsche, D.J. (1975) "Operational Problems and Solutions of Business Gaming: Primer," pp. 41-47 in R.H. Buskirk (ed.) Proceedings of the Second National Conference of the Association For Business Simulation and Experiential Learning.
- Halpin, A. and W.D. Biggs (1989) "A New Wave of General Management Games: A Preliminary Review," Paper presented at the Association for Business Simulation and Experiential Learning Conference, Orlando, FL.
- Keys, B. (1976) "A Review of Learning Research in Business Gaming," pp. 173-184 in B.H. Sord (ed.) proceedings of the Third Annual Conference of the Association for Business Simulation and Experiential Learning.

Developments in Business Simulation & Experiential Exercises, Volume 17, 1990

- Keys, B. (1980) "Total Enterprise Business (Games: M Evaluation," pp. 277-285 in R.E. Horn and A. Cleaves (eds.) The Guide to Simulations/Games for Education and Training. Newbury Park, CA: Sage.
- Keys, B. (1987) "Total Enterprise Business Games," Simulation & Games, 18:225-241.
- Meier, R.C., W.T. Newell, and H.L. Pazer (1969). Simulation in Business and Economics Englewood Cliffs, NJ: Prentice Hall, Ire.
- Watson, H.J. (1981) Computer Simulation in Business. New York: John Wiley.
- Whiteley, T.R. and A.J. Faria (1989). A Study of the Relationship Between Student Final Exam Performance and Simulation Game Participation," Simulation & Games, 20: 44-64.