WORKSHOP: HARDWARE, SOFTWARE, AND PEOPLE PROBLEMS IN INSTALLING
BUSINESS GAMES OPERATIONAL PROBLEMS AND SOLUTIONS
OF BUSINESS GAMING: A PRIMER

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Prior to the installation of a business game for classroom use, it is always interesting to speculate on the problems one is about to encounter. Even the veteran gamester from time to time encounters problems which are new to him. When one moves from one computer system to another, whether the move is an upgrading of an institution's facilities or a change of institutions, system specific difficulties are often encountered which must be overcome.

The objective of this paper is to acquaint the reader with the various types of problems one can encounter and to offer solutions which have been used by other game players. The paper is based upon the results of a survey of ABSEL members regarding problems experienced when utilizing computerized games. All 121 members listed on the October 28, 1974, ABSEL roster were sent a questionnaire. Fifty-two responses were received in time to be included in this report. The survey was based upon a conceptual paper presented by the author at the National Gaming Council Symposium in Pittsburgh [11 . The present paper is intended to serve as a means of communicating useful techniques among ABSEL members and as a useful reference for potential users of business games.

For purposes of discussion, business gaming problems are divided into four mutually exclusive categories: computer problems; game problems; student problems; and colleagueal problems. Each of these categories will be further subdivided in the discussion below.

COMPUTER PROBLEMS

Computer problems can logically be subdivided into problems involving computer personnel, computer hardware, and computer software. Of the three areas, it probably will come as no surprise that computer software topped the problem list in the computer category.

Computer Personnel

ABSEL members were queried concerning the availability of personnel, the cooperation of

personnel, and the competency of computer personnel.

Availability of Personnel

Ten respondents stated that computer personnel were not available when they were needed to help install a game. This lack of assistance was experienced from one to three times per respondent. The problem was resolved by getting aid from a colleague in the same institution, by enlisting aid from a colleague at another institution, by finding graduate and/or undergraduate students to help, by hiring the work done, or by the respondent's doing the work himself. It is interesting to note that this problem occurred at both large and small institutions.

Cooperation of Personnel

Only two respondents encountered personnel who refused to install a game. The problems were resolved by working through the department head or by installing the game with the assistance of colleagues.

Competency of Personnel

Ten respondents indicated that they had dealt with computer personnel who were incompetent. The problems ranged from making a simple game look complicated to generating new problems in a game. The situation was resolved by getting help from colleagues, by getting another school computer service to assist the computer personnel, by learning how to install the game, by using computer personnel as assistants or by simply installing the game. The responses indicate that incompetence was not particularly correlated with size of institution.

Computer Hardware

Computer hardware problems normally revolve around access to equipment required to run a game. The access limitation may result from the available equipment not being sufficient to run the game or from administrative limitations placed upon use of the available equipment.

Insufficient Equipment

Eighteen respondents experienced equipment insufficiencies at one time or another. The most common problem appeared to be insufficient core to hold the program. This problem was resolved by writing overlays, by modularizing the program and loading the modules, and

by changing to a game requiring less core. Other responses indicated computer personnel assisted in working around the problem. Unfortunately, the specific problems were not delineated in other than a general way.

Administrative Limitations

Administrative limitations were mentioned by ten respondents as a problem confronted when gaming. These took many forms. Some respondents were faced with financial limitations. These were met by carefully controlling computer requirements. Another problem mentioned involved terminal or computer access time limitations. In this case one may have to work around the restrictions by careful scheduling. Some installations place printout limitations on users. These take the form of restricting the number of printouts per run, the number of pages per printout, or the amount of time allotted for a printout. Where duplicate printouts are limited, a copy machine has been used. In cases where the number of pages or the time for a printout is restricted, satisfaction has been obtained by going to the academic administration to obtain an exemption. Another route is to attempt to compress the output onto fewer pages. If one is processing several industries in a series on the same run, output can be shortened by running each industry separately. This latter technique may also be used to get around a low priority assignment sometimes given to game runs requiring an extensive printout, the printout in this case necessitated by running the industries in series. If low priority assignments result in delays which cannot be resolved, some respondents have resorted to spacing decisions to allow for the extra time which may be required. This does resolve the problem; however, the number of iterations which can be played during the academic period is reduced. Several responses indicated access problems due to the administration's having priority use and/or the administration's being more interested in selling time than processing academic work. The only solution offered in the latter case was to hang on until the administration changes.

Computer Software

Problems involving computer software normally result from a game developed on one computer system being incompatible with another computer system, a game written in one version of a language not being compatible with another version of the language, or a bug in the software of a system.

System Incompatibility

Eighteen respondents cited system incompatibility as a problem they had encountered at least once. In one case the game requirements were not compatible with the library routines associated with the computer system. Several of the others appear to be language incompatibility and others were not definitive enough to determine if they were correctly classified. Thus, one suspects that eighteen is somewhat high of the mark. Three methods were listed to resolve the problem. Some respondents stated that either computer personnel or the user himself modified the game to make it compatible. Others obtained an adaptation of the game which was compatible. A third group abandoned the game.

Language Incompatibility

Language incompatibility was mentioned as being a problem for ten of the respondents. The problems ranged from missing periods required for an IBM system to incompatibilities of sufficient magnitude to require Basic or Algol conversions. The common solutions were to obtain a compatible adaptation of the game, to perform a computerized conversion, or to modify the existing program to either detune or upgrade the game language.

Software Bug

Twenty-six respondents listed software bugs as a problem encountered at least once. A number of these, however, appear to be bugs in the game and not system software bugs. Five of the responses appear to be definitely system bugs. The rest were either not complete enough to tell or were game bugs. System bugs were handled in one or more of three ways. At times computer personnel were able to eliminate the bugs. Other respondents reprogrammed around the bug. In cases where the bug appeared to be random, a run was resubmitted and the game continued. In one case, the bugs were so successful that the game had to be discontinued for the remainder of an academic period.

GAME PROBLEMS

Problems involving the game itself consist of insufficient documentation and game residing bugs. A game that is well documented can be installed on a system in a minimal amount of time. If a problem in game operation does occur, adequate documentation greatly reduces the time required to rectify it.

Insufficient Documentation

Twenty-three respondents cited inadequate documentation as a problem they have encountered. Documentation problems included insufficient or no variable dictionary, inadequate comment cards, and parameters not adequately described. In addition, input-output devices are occasionally not specified or their purpose is not described. Several respondents went so far as to state that games are never adequately documented. The problems were resolved by calling the authors for additional information, by giving the game to computer personnel to work out, and by studying the program until it was sufficiently understood to enable the user to resolve the problem. Several respondents developed their own documentation after a great deal of time and effort.

Game Bugs

Internal bugs in a game can take on so many forms that it is impossible to describe an average bug. Twenty-nine respondents claimed to have experienced problems with game bugs. Several of the responses, however, made it clear that the bugs were encountered while a game was being written. The responses indicate that games are generally debugged by computer personnel or by game users. The method, of course, would depend upon the user's time commitments and his knowledge of programming as well as the support provided by computer personnel. One respondent stated he used a FORTRAN compiler and debug routine for assistance. Of course adequate documentation is of great assistance in any debugging operation.

STUDENT PROBLEMS

Problems involving students generally involve either students ceasing to play a game due to lack of interest and/or poor performance or errors in student decision forms.

Stop Play

Only three respondents encountered students who actually stopped playing. Beyond personal appeal, no suggestions were offered to resolve this problem. Several respondents indicated they had students who lost interest in a game, particularly when they began to lose ground. One respondent used prizes to stimulate interest.

Decision Errors

Student decision errors were treated in a variety of ways. Some users simply rerun a decision after correcting the values which are in error. Several respondents have error checking routines some of which plug in a reasonable value for the incorrect value and continue the run. A significant number of instructors correct the errors and charge the team a penalty or a consulting fee. Others let the team live with the error unless it is so great as to severely affect the total performance of the team or other teams. In that case, the decision may be rerun after corrections, or some direct compensation may be made for the loss.

COLLEAGUEAL PROBLEMS

Colleagueal problems will generally take one of two opposing forms. Some faculty members tend to view gaming with academic disdain. On the other side of the coin, some colleagues may become extremely enthusiastic about gaming and request assistance in getting started.

Academic Disdain

To some faculty members, gaming is not an academic activity. It isa form of entertainment. Thus anyone using a game in a classroom is not really teaching. Thirty-one respondents mentioned colleagueal disdain as a problem they faced. One suggestion for solving the problem was to get the critics to play a game. Others suggested educating colleagues via explanation and observation of an ongoing gaming activity. Based upon the nature of the responses received, it appears as though there is significant tension existing between gaming and nongaming faculty members in many academic institutions around the country.

Enthused Colleague

This reaction is in the desired direction and is not really a problem unless an inordinate amount of time is required to assist the colleague. Certainly one would much rather spend time helping an enthused faculty member than disarming a skeptical colleague. Twenty-four respondents indicated demands upon their time were somewhat of a problem. In most cases respondents supplied the time. Some believed it to be an opportunity and not a problem. In some cases such assistance is provided by the computer center. In several cases respondents specifically stated that help was given with the understanding that the new

users would later be on their own.

COMMENT

Two areas appear to dominate the problems experienced by computer users. Game problems pose many difficulties for the experienced as well as the new game user. 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 other area, colleagueal problems, is a mixed bag. On the one hand the game user is criticized for his endeavors. On the other he is overwhelmed by requests for assistance by colleagues. Hopefully, the criticism will decline either through faculty education or through faculty attrition. The time demands should decrease as more colleagues become adept at running games in the educational setting.

While the above two areas are dominant, there appear to be computer problems at some installations which are much more crucial to the utilization of a game. In some cases, the problems can be circumvented; however, in others it may not be possible to install a specific game or, possibly, any game.