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MICROCOMPUTERS--A NEW TECHNOLOGY FOR INNOVATIONS IN BUSINESS SIMULATION

Kenneth R. Goosen, University of Arkansas at Little Rock

ABSTRACT

Microcomputers are small compared to large mainframe computers, nevertheless, they are powerful computers within their limitations. The computing power of microcomputers are more than sufficient to allow the full processing of computerized business games. The characteristics of portability, simplicity, and flexibility make many innovations possible in the future development of business games.

INTRODUCTION

In the last few years, several companies have manufactured and marketed microcomputers--such as the Radio Shack IRS 80, the Apple II, and the Commodore PET. These computers outwardly are small-scale versions of the large Computers, but internally are based on new central processing technology. As compared to large conventional computers, these computers are slow and limited in memory; consequently, except for very small businesses, they have limited commercial practicality. Nevertheless, despite their limited computing ability, for many personal uses and educational tasks they represent powerful computing machines.

This discussion is based on the Radio Shack TRS 80 computer since this is the machine that I personally own and on which I have done all of my simulation research and game development. The TRS 80 minimum configuration consists of:
* a Z-80 microprocessor housed in a 53-character ASCII keyboard
* a 12" video monitor
* a cassette recorder.

Radio Shack has recently marketed an improved version of the Model I, which they call the Model III. It is my belief that the minimum configuration updated to 16 K of memory is more than adequate of most small educational business simulations. I have upgraded my TRS 80 to 16 K of memory.

The major question to which this discussion addresses itself is: What can the minimum configuration computer such as the Radio Shack Level I microcomputer do for the development and enhancement of collegiate educational simulations and games? The answer is, a great deal. Specifically, the above question can be answered in terms of the following key words:

Low Cost	Flexibility & Convenience
Personal	Simplicity

Low Cost

The minimum configuration which I have successfully used for three years cost less than $1,000. I eventually plan to purchase a printer. A printer adequate for my needs cam be purchased for around $800.

Personal

For me personally, my Radio Shark TRS 80 has increased my efficiency in the development of new material by eliminating downtime, turnaround time, and inconvenience of long walks from the business administration building to the computer center. Furthermore, I am able to make internal classroom use of a computer that otherwise would be impossible at our campus. We do not have distributed processing at the current time; and given that we did, only a few selected classrooms would have on-line terminals,

Flexibility & Convenience

Microcomputers are compact and light weight, giving them tremendous flexibility regarding location of use.

Simplicity

A beautiful fact about microcomputers is that, like automobiles, they are extremely technical yet simple to operate.

My use of microcomputers has led me to conclude that microcomputers have a great future in collegiate business education, particularly those aspects having to do with the development and use of simulations.

To give a case example. I have written a relatively simple inventory simulation which I have used to date eight or ten times in class with my students. Each time the game has been played on my personally-owned TRS 80 microcomputer. The simulation requires that each team make two decisions, order size and number of orders. These two decisions are made each period for one month in advance. The objectives Is to minimize the cost of managing inventory: stockout Costs, purchasing costs, and carrying costs. Before distributing copies of the simulation to students, a one hour lecture is given on the theory of inventory management. In the class just prior to game play a brief explanation of the simulation Is given.

On the scheduled date, when students are assembled as a class, five minutes is given to allow their first set of decisions to be finalized. Although the game is not complex, winning or doing well requires good analysis of data. At the end of approximately five minutes, the first set of decisions is obtained and entered directly by keyboard. Since the computer is actually in the classroom, all students witness the full processing of data. When the decisions for the last student team are entered, the computer automatically executes the program and gives the game results. The team with the lowest cost is always shown first, and other teams are ranked accordingly. Because the game has a random number generator which introduces an element of chance, teams which do not have good strategies rapidly fluctuate in standings. In a 50-minute period, from 10 to 12 periods of play can be made.

The ability of the microcomputer to compute results, keep score, and display standings within a fey seconds makes the microcomputer art outstanding piece of techno- logy to make innovative advances in the art of business simulation usage.