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USING A SIMULATION PACKAGE TO DEVELOP A SIMULATION EXERCISE IN COST ACCOUNTING

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ABSTRACT

A cost accounting exercise is developed using a simulation package called SIMFACTORY. Students develop cost accounting reports using an animated simulation. This exercise is used to give students a more realistic understanding of cost flows in a factory.

INTRODUCTION

In this project we develop a simulation exercise in cost accounting using SIMFACTORY. Our objective is to show how animated simulations can be used as supplements to a cost accounting course which incorporates both traditional cost accounting approaches like job order and process costing and more advanced topics such as operations costing and costing in continuous flow manufacturing environments such as Just-In-Time (JIT). The experience itself is a microcomputer based simulation exercise. It is designed to provide cost accounting students with a more realistic sense of the flow of events in a manufacturing environment and how cost accounting techniques interface with and capture data about those events. In addition, the experience allows students to gain experience with several different microcomputer tools including a highly sophisticated simulation program, a small stand-alone data entry package and a spreadsheet program.

GENERAL APPROACH

In this project "factories" are developed using a sophisticated animated simulation package called SIMFACTORY. Each "factory" is a animated schematic picture of a plant floor which incorporates a particular approach to manufacturing. Students do not create the "factories" but use ones previously developed by the instructor.

A student begins an exercise by running a "factory." Because the simulation is animated, the student watches as products move into and out of inventories and through processes and operations. Periodically students must capture data from the "factory" by generating inventory and machine utilization reports. Since the "factory" can operate indefinitely the experience specifies only the minimum amount of data, which must be captured from a "factory."

A SIMFACTORY simulation run only develops data about quantities. To obtain cost data students must use COSTSUM, a program which generates summary cost data based on the simulated quantity results obtained from the

"factory" run. COSTSUM provides reports which list direct labor, direct materials and overhead costs for each cost objective in the "factory." These results are saved to a file for further analysis. Finally, the student calls the file of costs developed by COSTSUM into a spreadsheet program and develops cost and variance summary reports. These reports are unique to each student since the quantity, utilization and cost data are uniquely generated by SIMFACTORY and COSTSUM.

SYSTEM REQUIREMENTS

Hardware

Because of the specialized hardware needed for SIMFACTORY, the most effective approach to using SIMFACTORY with a class is to establish a simulation workstation on which the students can run the "factories". This workstation is used only to generate the production quantity data for first step of the exercise. The balance of the exercise can be performed on virtually any microcomputer.

Several computer configurations can provide the minimum hardware required to run SIMFACTORY. Optionally you may add a plotter or printer for making prints of the graphics screens and copies of the snap shots. To be most effective the system should have color graphics capability.

Software

The SIMFACTORY simulation package is available from CACI Products Inc. While the commercial cost of the package is likely to be prohibitive for most academic institutions, CACI has made special arrangements in the past to provide this product to academic institutions at a greatly reduced price. COSTSUM is a program written by the authors in BASIC. It is available from the authors upon request. Any spreadsheet software such as LOTUS 1-2-3, Quatro or VPP Planner can be used for the third step in the exercise.

SUMMARY

The use of computer simulations as pedagogical tools has a long history. However, powerful animated simulation packages such as SIMFACTORY have not been brought into the classroom. In this paper we describe a way in which an animated simulation exercise can be used to enhance the realism of cost accounting. This project is continuing and the authors hope to develop applications for a variety of different cost accounting problems.