

# Developments in Business Simulation & Experiential Exercises, Volume 16, 1989

## A GAME TO INTRODUCE ACCOUNTING INFORMATION SYSTEMS STUDENTS TO CERTAIN INTERNAL CONTROL CONCEPTS

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### ABSTRACT

Lack of experience with real accounting systems can hinder the understanding of internal control concepts in accounting information systems (AIS) courses. Experiential learning, in which game playing or simulations are used, is one way of overcoming this deficiency. This paper presents a simple, inexpensive and effective game which can be used to introduce AIS students to the concepts of documentation and segregation of duties. Using the game stimulates class participation and an understanding of these fundamental internal control concepts.

### INTRODUCTION

Increasingly, accounting information systems (AIS) is a course that is being required in the undergraduate accounting curriculum. For many students this course is difficult conceptually because many of the basic elements are foreign to their prior accounting education and more importantly to their realm of experience. Two of the most important concepts presented in an AIS course are the role of document flows and separation of duties. To understand even the most basic accounting system, students must comprehend how documents convey data throughout an organization and act as instruments of control. Proper separation of duties is one of the foundations of a system of internal controls. Yet neither of these concepts is intuitive to students and for many they are beyond their experience. This paper describes a simple game which can be used in an AIS course to illustrate at a very basic level both of these ideas. It can be done within the context of a single class period, requires very rudimentary supplies, and can actively involve all of the students in the class. When it is used early in the semester it has the added value of helping develop rapport a class which seems to carry through the semester.

### BACKGROUND

A large part of a typical AIS course is devoted to how an information system functions and how that information system can be designed to promote strong internal control. A general approach is to take the students through flowcharts, often document flowcharts, of a manual accounting system and explain to the flow of information through each segment or accounting cycle. This approach presumes students recognize the function of documents as

data carriers within the system and as vehicles of authorization. Because of the importance of documents to an accounting information system, document design may be discussed and the students frequently are shown examples of actual documents. At this point the students may have an intellectual understanding of the role of documents within an organization. However, unless they are able to relate that understanding to their own experiences they frequently find it difficult to apply these concepts.

One particular area in which it may be difficult to apply these concepts is in the use of documents for authorization and responsibility purposes. These are the major functions of documents in an internal control system. Accountants define internal control as "the plan of organization and all the coordinated methods and measures adopted within a business to safeguard its assets, check the accuracy and reliability of its accounting data, promote operational efficiency, and encourage adherence to prescribed managerial policies" American Institute of Certified Public Accountants [1949, p.6]. Understanding how documents are used for authorization of actions and the purpose of requiring users to "sign-off" on those documents is vital to understanding of an internal control system.

Another important part of the internal control system is the proper separation of duties among employees. Separation of duties is defined as "the separation of assigned tasks and responsibilities in such a way that no single employee can both perpetrate and conceal errors or irregularities" Cushing and Romney [1987, p.880] In order to achieve separation of duties three functions are assigned in such a way that no one person can accomplish any two of them for a single transaction where there is the potential for loss. These functions are authorization, physical custody and accounting or record keeping. As with document flows, separation of duties is usually explained to AIS students with examples or diagrams. The in-class game described below was developed in an attempt to present the students with a more experiential understanding of both of these concepts.

### DESCRIPTION OF THE GAME

The game involves four players (roles); a primary player (the manager), two secondary players (employee #1 and employee #2) and a supplier). The only materials required for the game are sets of sales orders (Figure 1)

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a supply of control documents (Figure 2) and a quantity of some item to act as inventory (e.g. poker chips).

### The Players

While the game can be used with randomly chosen members of the class in the roles it is more efficient to choose at least the manager before hand and brief her/him on how to play the role. Most randomly chosen students put in the position of manager in this game will not attempt to take advantage of the system weaknesses even when given an opportunity to do so. Unfortunately, this is a game in which honesty is no virtue. Others will attempt strategies which are inappropriate (such as lying about the price at which items are sold) or will attempt strategies which are inherently flawed. With randomly chosen players it usually takes several attempts before the true weakness of the system as it is set up is identified and exploited. While these attempts can be used to illustrate interesting points, they prolong the game substantially. By briefing the person in the manager's role prior to the start of the game the pace can be increased significantly.

### The Order of the Game

The game is played in a series of independent rounds. At the beginning of each round the players are organized to reflect the type of controls desired for that round. All inventory is controlled by the supplier except an initial endowment which should be enough to meet the demands of the first two sales transactions. This is sufficient inventory to set the pattern for transactions but also forces some inventory purchases soon after a round begins. The manager and any employee players used in a round are seated at the front of the class in clear view of the other students. The supplier player is seated physically away from the other players with a chalkboard or some other form of tally sheet positioned so that it can be seen by the class but not the role players. He/she is given a sufficiently ample supply of inventory and a sheet listing the unit price of inventory for each round. Some member of the class is designated the reporting official. The game then proceeds with Round 1.

Round 1: In Round 1 only the manager plays. No control documents are used and no separation of duties can be accomplished. To begin the round the instructor hands out pre-numbered sales orders to randomly selected class members (see Figure 1). The instructor explains; 1) that the manager is the sole employee of this firm who orders inventory, makes sales, records all transaction amounts and maintains physical custody of the inventory, 2) the supplier will supply what ever inventory the manager requests at the posted price during the round, 3) all inventory is readily convertible to cash at the posted price (consequently there is

an incentive to steal inventory), 4) at the end of the round the manager will compute profits and give that number to the reporting official, and 5) each student is to maintain a separate tally of profits. The instructor then shows the class the initial inventory, announces the quantity and hands it to the manager. The student with the first sales order is instructed to come forward, announce the quantity and price to be paid for items from firm inventory as it is listed on the sales order, collect the items from the manager and return to his/her seat. At any time the manager may go to the supplier to obtain additional inventory. After any inventory purchase the supplier posts the quantity taken on the tally sheet for the class to see. After the last sales order has been executed the instructor announces that Round 1 is over and asks the class and the manager to compute profit totals and inventory balances. The manager writes these figures on a piece of paper, folds it and hands it to the reporting official. The class is then solicited for the amount of profit and balance in the firm inventory account. After these have been written on the chalkboard the reporting official is asked to reveal the manager's reported totals. If the manager has played the role successfully, she/he will purchase more inventory than is recorded and charge the lost inventory to cost of sales. Consequently, the reported profits and inventory balances will be lower than the values computed by the class.

Round 2: In Round 2 a second employee (Employee #2) is brought forward and seated next to the manager. Employee #2 is assigned one of the primary functions (record keeping) and control documents are used. The instructor explains the new arrangement and informs the players that any communication between them during the round must be by control document. They will be required to use what information they have (and only that information) to arrive at a profit total at the end of the round. They must agree on that total before giving a value to the reporting official. The initial inventory is reestablished, a new set of sales orders is distributed and the new price of inventory is posted by the supplier (but can not be seen by Employee #2). The game then proceeds as before. Each buyer approaches the manager and makes his/her purchase while announcing the amount and cost. The manager then takes the sales order from the buyer after filling the order, initials it and passes it on to Employee #2. As before the manager can obtain inventory from the supplier at any time but after each purchase she/he must fill out a control document specifying the quantity purchased and price paid (of course these will not be the actual amounts), initial it and pass it on to Employee #2.

At the end of the round the same procedure as at the end of Round 1 is followed except that the manager and Employee #2 must agree on the reported inventory quantity and profit. Since

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the manager still had both authorizing and custody functions she/he should have been able to manipulate inventory in the same fashion as in Round 1. Therefore, the same effects should be evident. This round demonstrates that partial implementation of separation of duties even with the use of control documents can still yield a system with significant weaknesses. In fact, the resulting system can be no better than a system with no separation of duties or documents at all.

Round 3: In Round 3 a third employee (Employee #3) is introduced. All three of functions are separated. The manager has responsibility for inventory custody. Employee #2 has record keeping responsibility and inventory purchases must be authorized by Employee #3. As in Round 2 communications during the round must be by control document. In this round buyers present their orders to the manager who fills the order, initials the sales order document and passes it to Employee #2. When the inventory needs replenishing the manager fills out a control document specifying the amount of inventory to be purchased and passes it to Employee #3 who initials the document and returns it to the manager. The manager then presents the document to the supplier who provides the specified quantity, writes the cost per unit on the control document and initials it in the appropriate place. The manager then returns the control document to Employee #2 for recording. At the end of this round all three confer to determine a profit total which is passed to the reporting official as in previous rounds. Because of the increased level of controls introduced in this round there should be no difference in the reported and actual amounts of profit.

At this point the game may be terminated or if time permits various other combinations of controls and documents flows can be tested. Students generally find it a challenge to devise a scheme which can either circumvent the controls or correct existing system failures. This can lead into a discussion of the use of these types of controls in more sophisticated and realistic environments.

## CONCLUSIONS AND DISCUSSION

Through the use of a simple game, students in an AIS class can be give a graphic lesson in the role of documents and separation of duties in a system of internal controls. The game requires a minimal amount of resources and involves the entire class at some level. It offers ample opportunity to illustrate the internal control concepts involved. Students frequently become quite committed to the game and actively seek to devise schemes to defeat the controls that are put in place. This involvement seems to have a positive effect which carries over into later discussion.

FIGURE 1

A Sales Order Document

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SALES ORDER

Round \_\_\_\_\_ Order # \_\_\_\_\_

Instructions: When your round and order number are called, proceed to the order desk and purchase the quantity specified below. Call out the quantity and price clearly to the class. Leave this Sale Order with the manager at the order desk.

QUANTITY \_\_\_\_\_

PRICE \_\_\_\_\_

Initial Below as Appropriate

Manager \_\_\_\_\_

Book keeping \_\_\_\_\_

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FIGURE 2

A Sample Control Document

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CONTROL DOCUMENT

Instructions: Fill out the parts of the document below which are appropriate for the current round.

EXPLANATION:

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INITIAL BELOW IF APPROPRIATE:

Manager \_\_\_\_\_

Authorization \_\_\_\_\_

Accounting \_\_\_\_\_

(For Purchase Orders Only)

Quantity Purchased \_\_\_\_\_

Purchase Price \_\_\_\_\_

Supplier's Initials \_\_\_\_\_

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1. The system described here is generic. If the instructor prefers to make the example conform more to the sales cycle he/she might want to change references to supplier and purchase order to warehouse and inventory requisition, respectively.

## REFERENCES

American Institute of Certified Public Accountants, American Institute of Accountants, Committee on Accounting Procedure, Internal Control (New York, 1949).

Cushing, B. E. and M. B. Romney, Accounting Information Systems and Business Organizations, 4th Edition (Addison Wesley Publishing Co., Reading, MA, 1987)