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ABSTRACT

In this case, students assume the role of an accounting professional asked by a client to investigate why net income is not as strong as expected. The students must first analyze a set of financial statements to identify areas of possible concern. After determining the areas to investigate, the students use a database query tool to see if they can determine causes by examining transaction level data. Finally, the students are asked to professionally communicate their findings and recommendations to their client. The case provides students with experience in using query-based approaches to answering business questions. It is appropriate for students with basic query and financial analysis skills and knowledge of internal controls. A Microsoft Access database with transaction details for the final seven months of the current year as well as financial statements for the current and prior year are provided.

Keywords: financial statement analysis, query strategy, database querying, internal controls

Editors Note: Awarded Best Paper at the 2012 AIS Educator Conference.

The case and a teaching note and grading rubric rubric are available for use with this case. If you are a dues paying member of the AIS Educator Association, go to http://www.aiseducators.com and follow the links for the AIS Educator Journal.

INTRODUCTION

This case presents students with a classic example of what too often happens in the real world, where owners do not perform the oversight function that is crucial in a small business and let trusted employees have the keys to the kingdom. The case addresses four objectives that can be used in their entirety or individually assigned and assessed. Through performance of financial statement analysis, students are asked to first identify areas of concern for further investigation and then to hypothesize possible causes that could be investigated. Alternatively, those steps could be provided, and the students would then be required to complete the other two objectives. The first of those is to have students practice using query skills to identify questionable transactions. The second is to provide the "client" with a written communication including an analysis of internal controls and recommendations for strengthening controls in the company.

Both educators and professionals have long recognized the advantages of accountants having knowledge of database concepts (Borthick, 1996; Fang, 2007). Anecdotal evidence indicates that accounting students with systems knowledge are in high demand. Fordham (2005) reports that several recruiters at his school have expressed a preference for accounting majors with a strong systems background and are willing to pay a premium for graduates having that education. In a survey of alumni with AIS minors, Fordham found that knowledge of databases concepts was considered an essential part of the program.

In spite of these advantages, many accounting students do not understand the value of learning database concepts. Prior research has shown that actual use of databases enhances students' acquisition of database concepts and increases their interest in acquiring additional systems knowledge (Norman, Rose, & Rose, 2006; Zhou, Djatej, Chen, & Senteney, 2011). This case requires students to practice querying skills in a situation that is more realistic than textbook examples. It links the knowledge students acquire in the AIS course to a problem they can understand and that could be encountered in practice. Based on their analysis of financial statements, students are required to query a database containing transaction-level data to detect the reasons behind changes in profitability. It addresses the growing need for accounting graduates to be able to analyze large volumes of transaction data.

CONTRIBUTION TO CASE LITERATURE

In the past decade, several cases have been published to develop student query skills. The *Web Referral Case* (Borthick, Jones, & Kim, 2001) is the most basic. It does not require any proficiency in writing queries prior to completing the case. Two other cases by Borthick and Jones (2005; 2007) were designed to increase competence in developing queries. Their *Wireless Billing* case also requires students to specify potential errors in billing. Loraas & Searcy (2010) published a case using an Access database that contains a complete year of general ledger transactions. Students are asked to develop queries that would identify potential problematic journal entries. These cases all provide a database to the students. Three other cases (Bradford, Samuels, & Wood, 2008; Borthick, Bowen, & Gerard, 2008; Cosgrove & Garnsey, 2006) require students to model the business in addition to developing queries. In those cases, students draw a conceptual data model. The Bradford et al. and Borthick et al. cases also require students to draw a process map. The 2008 Borthick case, like those mentioned previously, provides an Access database for students, while in the Bradford et al. and Cosgrove et al. cases, students implement the conceptual model in Access and import data from Excel.

This case is similar to the Loraas et al. and Bradford et al. cases in that it contains a realistic amount of data and requires a professional communication. Unlike Loraas, rather than identifying questionable items through querying, this case requires students to first examine the company's financial statements. This initial step develops critical thinking skills by asking students not only what items should be examined further but also what are the possible causes of changes in financial statement items that appear out of line with expectations.

DESCRIPTION OF MATERIALS

Students are required to perform financial statement analysis, to identify areas of concern, to postulate reasons for any noted financial weaknesses, and then to develop queries or other investigative procedures to test their hypotheses. The following case materials are posted at the AIS Educator website to be used by the students in their analysis and the instructor for teaching notes and solutions:

I. Student Materials

- Case narrative: The narrative provides the history of Cazenovia Creations, the largest independent seller of hand-crafted items in western New York, Ohio, and Pennsylvania. Cazenovia Creations was started by Meghan McGuire, a jewelry craftsperson, who expanded the business to sell not only her own creations but those of other crafters throughout the region. As the administrative and financial duties grew, Meghan hired Sylvia Somerset as her bookkeeper/office manager and gradually increased her reliance on Sylvia to perform all financial functions. The narrative includes a detailed description of the revenue, vendor, expense payment, payroll, and financial functions indicating the processing, documentation, database files, and financial reporting system currently utilized by Cazenovia Creations. Sylvia's responsibilities in each area are clearly delineated.

- Financial Statements: The necessary financial statements include comparative Income Statements and Balance Sheets for 2011 and 2012 and a 2012 Statement of Retained Earnings (provided in narrative and as an Excel file to facilitate analysis).

- Assignment Requirements: The case assignments are divided into two sections. The first requires the financial statement analysis, the identification of areas of concern, and suggestions for investigative procedures, both through querying and non-database analyses. The second assignment requires the students to create and perform the queries that assist them in uncovering any irregularities that have occurred. Students are asked to document their investigative processes and results. Finally, each student must prepare a client letter discussing any internal control weaknesses, irregularities discovered, and recommendations for improvements to the systems that would be appropriate for a business of this size.

- Access Database Files: The database provides the final seven months of transaction data for 2012.

II. Instructor Materials

- Teaching Notes: A detailed case assignment utilization and possible grading rubric is provided. A complete suggested solution includes the financial statement analysis, tables indicating the areas to be investigated, references to possible queries, and a sample client letter.

- Solution Database: The second copy of the database includes possible queries that could be performed by students to determine the cause(s) of the decline in net income.

LEARNING OBJECTIVES

This case was originally developed to increase students' query skills in solving business problems. Additional objectives include increasing student analysis and critical thinking skills.
Specific learning objectives are for students to:

1. Identify areas that require further investigation through financial statement analysis.
2. Critically evaluate and list the possible causes for changes in areas that were identified as requiring investigation.

3. Develop queries for those items that can be investigated using the transaction data provided to determine if any of the possible causes exist.
4. Communicate findings to a client in a professional manner, which would include a discussion of the importance of specific internal controls to mitigate the risk of errors or irregularities.

ASSIGNMENT USE

This project in its entirety is suitable for undergraduate or graduate courses where students have been exposed to financial statement analysis, internal control concepts, and basic querying skills. Initially, basic financial statement analysis is required. Students are often exposed to this type of analysis in their first financial accounting course. The project reinforces this basic analysis and illustrates the practical application of such an examination. The required client letter reinforces written communication skills.

The project can work well even with students who have had little exposure to Access prior to the course. In our course, after spending approximately a week on the text database chapter, two or three classes are spent introducing Access in a computer lab. Students must be able to perform the following query operations: join tables (including outer joins), build expressions, apply the *Group By* operator, and use built-in functions. Students should complete a short assignment, such as Borthick et al. (2001), or be tested on query skills prior to this assignment.

Depending upon the time allocated to the assignment and the specific objectives desired by the instructor, the project can be used in its entirety or as an abbreviated assignment as follows:

1. The project could focus primarily on the financial statement analysis and the identification of internal control deficiencies without requiring the Access database component. In that option, students would perform Assignment 1 and then prepare the required business letter identifying areas of concern regarding internal control deficiencies and providing recommendations for improving internal controls.
2. If an instructor's primary objective is to concentrate on the development of query skills, the financial statement analysis of assignment 1 could be provided to students. Students would then work in small teams to identify potential causes of discrepancies. Through class discussion, students would review the items identified by the groups and determine which would warrant further investigation. Then students (individually or in small teams) would determine which of those causes could be investigated by querying the database and develop the queries to address those issues.

STUDENT LEARNING AND FEEDBACK

Although students find the case challenging, in general, they feel that it enhances their learning. The following comment is typical when students are asked if there was anything they would change to help future students get more out of the project: "I wouldn't change much, to be honest. I know that certain things were just hard to find, and that's a good thing because that's how it will be in real life."

Students were tested on query skills prior to completing the case and after completing the case on the final exam. The tests used different databases and questions. The database used in the pretest was slightly smaller (four tables with five to six rows each) than the one used in the final (five tables with between eight and twenty-two rows each). Although for the most part the questions were different, they required the same type of query skills (see Table 1).

No additional instruction on querying was provided between the two tests. However, the instructor answered individual student questions while they were working on the case. The null hypothesis, that there was no difference in query skills between the two exams, was examined against the alternative that the query skills had improved, using a paired t-test. The null hypothesis was rejected ($p = 0.00062$, see Table 2). The application of skills learned in class to the case situation appears to improve query skills. In the semester end course evaluation, when students were asked about their level of accomplishment for understanding how to get information from a database, over 81% replied excellent or good.

Table 1: Types of Query Skills Tested	
Test prior to case	Final
Outer join required to show invoices without related invoice lines.	Outer join required to show inventory items with no orders.
GROUP BY/COUNT needed to show number of invoices for each product and, in another query, how many different products were ordered on each invoice.	GROUP BY/COUNT needed to show number of invoices for each employee is associated with and in another query how many inventory items are in each category.
Use an expression with GROUP BY/SUM to calculate the total dollar amount for each invoice.	Use an expression with GROUP BY/SUM to calculate the total amount for each order.
Various queries that restrict results based on comparison to given values of one or more attributes. For example: List the product number, description, and price for all products that cost at least $5.00.	Various queries that restrict results based on comparison to given values of one or more attributes. For example: Display all information about customers who made a purchase in March 2012.

Table 2: Comparison of Query Pre/Post Test Results			
	Pre-Test	Post-Test	Difference
Mean	80.9%	86.8%	5.8%
Standard Deviation	0.1154	0.0826	0.1143
Variance	0.0133	0.0068	0.0131
t- value			3.4497
Actual Significance Level			0.0006

Students were also tested on internal controls prior to completing the case and after completing both this case and the "Rogue Trader" case (Savage, Norman, & Lancaster, 2008) on the final exam. The null hypothesis, that there was no difference in internal control knowledge between the two exams, was examined against the alternative that students' internal control knowledge had improved, using a paired t-test. The null hypothesis was rejected ($p = 0.02219$, see Table 3). The increased knowledge of internal control principles cannot be solely attributed to this case. Rather, a combination of this case and the Rogue Trader case must be credited. In the semester end course evaluation, when students were asked about their level of accomplishment for understanding Internal Controls and their role in accounting, over 83% replied excellent or good.

Table 3: Comparison of Internal Control Knowledge Pre/Post Test Results			
	Pre-Test	Post-Test	Difference
Mean	62.2%	68.2%	6.0%
Standard Deviation	0.1452	0.1857	0.1925
Variance	0.0211	0.0345	0.0370
t- value		2.0712	
Actual Significance Level		0.0222	

SUMMARY

This case, based on a small business, responds to the desire of potential employers to have employees with database skills. It gives students the opportunity to improve their critical thinking by analyzing financial statements and enhances their ability to formulate queries to answer business questions. For many students, it isn't until they are in a work environment that they grow to appreciate the skills acquired through their AIS course and specifically this case, as indicated in the student e-mail reproduced here:

"I just wanted to let you know how much I have been using Access this summer. I have been doing an internship in Advisory at KPMG before I start full time on the 15th and I have been the go to for Access help for the entire engagement team (including managers). You would be surprised how many people don't know how to make a simple query, or even import data from a text document into Access. Many of the team members would not have been able to complete their work without using Access. It was great to be an asset to the team so early on.

Just wanted to say thank you and let you know that I'm already using what we learned!"

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