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Purchasing Process Internal Control Assessment: A Comprenhensive Case Study Using Data Analytic Software

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ABSTRACT

This case presents a situation in a purchasing department where potential control weaknesses need to be identified and tested. This short case is ideal for AIS or auditing classes. The students are required to perform a risk assessment, identify control objectives, design tests that would be covered in an audit and perform analysis on client-provided data. This case uses the IDEA data analytic software, but could be adjusted for use with ACL or other data analytic software. The case has been used in AIS and auditing classes and the feedback from students as to their enjoyment and learning from the case is overwhelmingly positive.

Keywords:
purchasing process, case study, risk assessment, control objective analysis, data analytics, software

A teaching note and electronic files are available for use with this case. If you are member of the AIS Educator Association, please go to http://www.aiseducators.com and follow the links for the AIS Educator Journal. If you are not a member of the Association, please contact the author directly at the address provided above to obtain these materials. Please provide a means for verifying your credentials as a faculty member so that we may protect the integrity of the solutions materials.

INTRODUCTION

Educators in accounting information systems are challenged to provide assignments that are realistic and interesting to students. The IDEA data analysis package can be used to help students gain skill sets desired by employers. At least one state board requires that two hours of the accounting curriculum be dedicated to writing for eligibility to sit for the CPA exam. Consequently, this purchasing case was developed to help fulfill the requirements for both data analysis using IDEA and writing up the data analysis findings. As systems educators, it is important to provide opportunities for students to work with "realistic business" situations that can be addressed using data analytics. A former student who has many years of industry experience (now working for Audimation, the US distributor of IDEA software) and an academic researcher wrote this case. The case was based on the former student's experience in industry. The analytical procedures and writing assignments were developed to provide a means for students to gain exposure to the use of analytics in industry and in auditing.

Background

Wang and Cuthbertson (2015) suggest that despite the results of surveys (Protiviti 2014), publications from the Big Four (Deloitte 2013, KPMG 2012) and auditing standards suggesting the importance of data analytics (PCAOB Statement No. 5 2007, SAS No. 94), auditors still have difficulty using computer-assisted audit techniques (CAATs) and data analytics in their work. The 2014 Protiviti survey administered to over 600 Chief Audit Executives (CAEs) found that internal auditors should enhance their "big-data knowledge" utilizing guidance in publications such as the Institute of Internal Auditors' (IIA) GTAG 16 (Data Analysis Technologies). The survey also suggests that CAATs are a top priority for internal auditors. Data analysis and manipulation tools are also high-priority items for CAEs. Deloitte (2013) suggests that analytics are essential to good planning (efficient use of resources) and better risk assessment. Analytics allow the auditor to capture all relevant information and harness the power of all of the data available in an organization to evaluate both what happened in the past, what is happening in the present, and what will happen in the future—or as they phrase it "provides hindsight, insight, and foresight". KPMG (2012) suggests analytics can transform the audit function and improve the ability of the auditors to use a risk-based approach to fraud detection and regulatory compliance.

Liddy (KPMG 2014) suggests that data analytics will allow auditors to do more than the simple "pass/fail" audits of the past, as they make use of "smart" data that work like neural networks and provide ways to expose possible risks based on information learned from previous periods. Rachtman (2012) submits that data mining allows the identification of relationships and trends that might not have been evident using a traditional approach. Wang and Cuthbertson (2015) state that the part of the reason why auditors might not be using analytics effectively stems from problems with the data (e.g., acquisition, quality) and "not knowing where to start". Providing training in the use of analytics in a case will help students become more comfortable with using data analytic software and interpreting results. Wang and Cuthbertson (2015) challenge the profession (and educators) to develop methods to train auditors in the evaluation of results to focus their attention on the most critical items. As accounting firms, internal audit departments and consulting firms try to use data analytics effectively, educators should develop the skill sets that students need to be able to transfer that knowledge to advance the students' careers in this data-rich environment.

Benefits of Using this Case

This case provides benefits to both the instructor and to the students by providing a real-life case for the students to analyze. It ties together the risk assessment and control identification steps in a process review, with an analysis of the client's data to identify exceptions and issues that would need to be addressed in an actual situation. With the three questions currently included, AIS students benefit from focusing on the risks inherent in the purchasing process to developing the testing they would do to see if the controls are working properly. Analyzing client-provided data allows the students to have a hands-on exercise to apply what they are learning about risks and controls. Adding a requirement to write an audit memo requires the students to really think about their findings and how that affects their risk assessment and recommendations to management.

LEARNING OBJECTIVES

This case is a comprehensive assignment that requires both data analysis and writing to understand and evaluate issues in a purchasing department. The data analytic portion can be completed in a lab in approximately 2 hours, assuming the students have had no exposure to the IDEA software prior to the lab session. The write-up of responses to the case questions can be used as a take-home assignment to be turned in either individually or in teams.

The learning objectives for this unstructured, open-ended purchasing department case include requiring the students to:

1. Identify inherent risks in the case company's purchasing department; that is, what can go wrong, assuming there are no controls in place?

2. Based on the identified risks, identify control objectives and testing required to determine if the controls are functioning properly.

3. Perform an analysis of client-provided data to test the controls

4. Write a memo to report the findings from the analysis and to provide recommendations to management for improvement

This exercise encourages critical thinking by the students as they analyze their findings and determine how these findings would be presented to management.

THE CASE

ICC Corporation has manufacturing plants all over the world. In the years from 2014 to 2017, the business at its **ABC plant** has grown at 40% per year thanks to the strong demand of the domestic market and new export business opportunities. The company is in a very good cash position. It implemented SAP in 2015.

The Purchasing department at the ABC plant is responsible for buying materials and plant expense items, such as spare parts, maintenance service, and any other items that are needed to keep the plant running. Some of the materials were actually negotiated by a buyer in another country's office to leverage the regional or global quantity, and the deals were forwarded to apply at the ABC plant. The buyers are delegated a certain spending limit but they are too busy to track the actual spending.

There are three buyers on the team at ABC plant. Two of them are new hires within the last six months. Their team leader, who used to be a Purchasing leader, is now taking on a shared role of Purchasing, Planning and Distribution leader. Due to the business growth and the

new responsibilities, he spends most of his time handling Planning and Distribution and less time purchasing.

The buyers usually sign a one-year contract with the material suppliers. The SAP system design allows the buyers to enter a contract price in the system, with an estimate of annual quantity needed. The planners then "release" purchase orders (POs) from the SAP system based on the actual production demand. After the materials for a PO have been delivered and paid for, the planners "close" the PO. After the PO is closed, no more items or payments can be made to the PO. To enable this system design, both the buyer and the planner have the ability to create and edit a Purchase Requisition (PR) and Purchase Order (PO) in SAP. Sometimes the planners make special requests to the suppliers, for example an expedited shipment, which causes the actual price to be a little higher than the contract price. The planners are told to never edit the PO price, only the purchasers should edit the PO. Other times the buyers are not made aware of the changes in the regional price deals to update the contract price in a timely manner. Material prices are trending up due to increasing oil prices.

Most of the plant expense items are bought on a "spot" basis. When there is an urgent need for spare parts, the machine operator quickly calls the supplier to deliver the spare parts, then forwards the invoice to the buyer or A/P for payment processing.

The corporate policy is to set up payment term agreements of at least 30 days with suppliers. Since 2015, there have been an abnormally high number of complaints from suppliers about late payments. The large numbers of purchase transactions make it difficult for the busy buyers to keep track of everything. The plant was shut down several times because the suppliers, who did not receive payment for their previous deliveries, would not deliver more materials until they were paid. Consequently, the plant could not operate without materials. The buyers have to spend so much time researching and solving payment issues that they do not have enough time to do the normal activities of a buyer (e.g., finding the best source/vendor for materials and services).

Required: You are a purchasing process consultant assigned to ABC's manufacturing plant.

Deliverable 1 (in-class discussion items, to be turned in before you leave class):

1. Discuss the risks inherent with the purchasing process at ABC's manufacturing plant.

2. Identify the control activities / objectives and recommended testing.

Deliverable 2 (completed after the above items are discussed in class):

3. The buyers have provided you with the data to test your control objectives. Perform data analysis using a data analytic software and report your findings to the buyers and management. In the report, provide the scope of the review, the tests performed, the findings and recommendations to improve the controls in the areas tested.

EMPIRICAL EVIDENCE OF EFFECTIVENESS

Evidence of Learning

A pre- / post-test was utilized to provide evidence of learning and case efficacy. The test consisted of several knowledge questions. Two questions related to the learning objectives of the case. The first question asked the student to identify risks that are typical for the purchasing function of a manufacturing company, this maps to learning objective 1: identification of inherent risks. The second question asked the students to identify control activities to help mitigate the identified risks, this maps to learning objective 2: evaluate/identify control objectives. We also evaluated the total score on the two questions.

The pre-test was administered prior to the administration of the ABC Plant case. The course materials up to that time included some discussion about risks and controls in general (e.g., as part of the COSO 2013 framework), but the class had not yet covered risks and controls specific to the purchasing process. Post-test data was collected after the ABC Plant case assignment was handed in.

Although our sample was small (9 graduate IT auditing students and 7 graduate AIS students), improvements were found on the post-test score total over the pre-test scores. Descriptive statistics for the individual test questions, which were administered both before and after the students completed this case, can be found in Table 1.

The paired-samples tests (Table 1) shows the total pre- vs. post-test scores differed significantly, ($\alpha < 0.005$, one-tailed test). In addition, the 16.8% increase in the post-test score on the question identifying risks represented a significant increase over the pre-test score ($\alpha < 0.018$, one-tailed test). The 12.4% increase (Table 1, Panel B) in the post-test score on the question identifying controls was marginally significant ($\alpha < 0.066$, one-tailed test). The 14.5% increase in the total score was also significant ($\alpha < 0.005$, one-tailed test).

The feedback questions were asked after the students completed the case. The mean agreement levels are shown in Table 2. The student agreement levels with regard to whether the case helped them understand the risks in the purchasing process, whether the case added to their textbook knowledge and the participants' enjoyment of the case had average agreement levels of 84.7%, 87.2%, and 82.8% respectively (where 100= strongly agree, 75 = agree). Graduate accounting majors made up 81.3% of the sample, and 75% of the sample had taken auditing previously.

Table 1: Results of Student Performance on Pre- and Post-Test Quiz of the Case Learning Objectives (N = 16)

Learning Objective	Question Topic	Pre-Test Mean (Std Dev/Max)	Post-Test Mean (Std Dev/Max)	Mean Difference	% Increase	t	DF	P-Value (1-tailed)
1. Identify Inherent Risk	Risks in manufacturing purchasing process	3.69 (1.14/5)	4.31 (0.95/5)	0.62	16.8%	2.30	15	0.018
2. Evaluate/ Identify controls to mitigate risk	Control activities to mitigate risk in purchasing process	4.50 (1.10/6)	5.06 (1.00/6)	0.56	12.4%	1.59	15	0.066
	Total Test Score	8.19 (1.52/11)	9.37 (1.63/11)	1.18	14.5%	2.97	15	0.005

Table 2: Feedback from Students after Completing the Case (N=16)

Feedback Ratings (Agreement Level)	Mean / (Std Dev)
The case aided my understanding of the risks in the purchasing process	84.7 / (18.5)
The case added to my textbook knowledge of understanding potential gaps in the purchasing process and controls	87.2 / (18.2)
I enjoyed working the case	82.8 / (15.6)

Feedback Range:

0	10	20	30	40	50	60	70	80	90	100
Strongly Disagree			Disagree			Neutral			Agree	Strongly Agree

CONCLUDING REMARKS

This case has been used in both graduate and undergraduate AIS classes, in a graduate IT auditing class, and in a graduate fraud examination class. Results reflect that the students did significantly increase their level of knowledge about identifying risks and potential controls to help mitigate those risks in the purchasing process. Additionally, students enjoyed working the case and the deliverables were adjusted to meet the course objectives as necessary. The deliverables as listed above are geared for undergraduates and can be modified for graduates. Information about how to adjust the deliverables for graduate classes can be found in the teaching notes.

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