Accounting for Systems Analysts in the 21st Century

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Abstract

Computer Information System (CIS) majors are required to successfully complete an introductory accounting course. Given the current forces in the financial world, the appropriateness of this course warrants scrutiny as to whether it properly serves the student, and the degree to which it continue to meet the IS 2002 outcomes. The current business learning outcomes are cited in the IS 2002 document. An introductory accounting course should be updated to include a deeper study of financial statements, accounting cycles, and financial ratio analysis. This paper attempts to answer the question: What are the key accounting concepts that should be taught to CIS students with a focused goal of preparing them for careers as systems analysts in the 21st century?

Keywords: Learning outcomes, assessment, introductory accounting course, systems analysis

1. INTRODUCTION

Over the last several years there has been an increased emphasis at colleges and universities on evaluating program learning outcomes and assessing student success in acquiring and applying knowledge. Measuring learning outcomes is time consuming and is often more qualitative rather than quantitative, thus open to interpretation. Assessment is especially challenging in a department such as CIS as students can follow many different career paths (network analyst, database analyst, systems analyst, and programmer analyst) which may result in different course requirements. The added challenge of program evaluation is that some of the required learning outcomes are delivered through other departments and are not within CIS department faculty control.

With respect to the IS 2002 guidelines, the business courses, particularly in the accounting arena, are ripe for CIS faculty to begin investigating. The current problems, opportunities and directives associated with accounting present salient challenges to supporting those outcomes. Other service courses such as mathematics, history and English cover timeless topics, whereas certain accounting practices and procedures have changed dramatically in the last few years.

CIS faculty are reliant on faculty in other departments as subject matter experts to assist in planning, offering, and assessing student learning outcomes for required but non-department courses. Many of these service courses, such as Introduction to Accounting, which are required for a well-rounded CIS education, are core courses in their own respective programs and may have different goals for its majors than the outcomes desired for CIS graduates required by the IS 2002 guidelines.

2. BACKGROUND

The Introduction to Accounting course was originally intended as a survey of accounting topics with an emphasis on understanding financial statements. Although all courses should be periodically reviewed in terms of their effectiveness in meeting the stated student outcomes, the rapid and on-going changes in accounting bring this subject to the forefront. Because every organization, whether non-profit, for-profit, public or private, has an accounting system and a financial infrastructure, CIS students pursuing a profession in system analysis must be intimately familiar with the organization's financial systems as their work routinely impacts this organizational function.

The rising incidents of financial accounting improprieties of Enron, World.Com, Adelphia and the like, have led to increased legislative mandates, such as the Sarbanes-Oxley Act (SOX). The SOX act requires organizations to establish and document accounting controls which has significant implications for the systems analyst. These mandates have become key components in the analysis, design and implementation of accounting information systems. Consequently, systems analysts now hold greater responsibility for working closely with financial managers to ensure compliance with these mandates (IS 2002 Goal 3).

In other words, computer information system technical proficiency alone is not sufficient. Any computer job that is defined by a narrow set of skills is completely exportable (Furst, Isbell, & Guzdial, 2007). Graduates are expected to not only have highly developed computer skills but also a broad knowledge of business including a substantive understanding of the organization's financial activities which requires sophisticated analytical and critical thinking skills (IS 2002 Goal 2). New CIS employees are expected to not only understand rapidly developing technologies but, also to take advantage of opportunities that technology affords in assisting organizations to realize their full potential (IS 2002 Goal 4). For example, the rapid growth of e-commerce has both a key technological component and a related financial activity component, positioning the systems analyst to provide support by blending technology skills and a solid understanding of financial accounting systems (IS 2002 Goal 1).

Since many CIS students will select the systems analysis career path the CIS faculty used the outcomes identified in a systems analysis text as a starting point:

"General knowledge of business processes and terminology – Systems analysts must be able to communicate with business experts to gain an understanding of their problems and needs. For the analyst, at least some of this knowledge comes only by way of experience. At the same time, aspiring analysts should avail themselves of every opportunity to complete basic business literacy courses available in colleges of business. Relevant courses may include financial accounting, management or cost accounting, finance, marketing, manufacturing or operations management, quality management, economics, and business law." (Whitten, 2007)

These goals match nicely with the representative capabilities and knowledge expected for CIS program graduates following IS 2002 guidelines: Business Fundamentals: Functional Business Areas: accounting, finance, marketing, human resources, logistics and manufacturing (Gorgone, Davis, Valacich, Topi, Feinstein, & Longenecker, 2002)

3. ASSESSMENT

In assessing the outcomes of the required introductory accounting course and how it contributes to the students becoming competent systems analysts, it is important

to investigate what is being taught and which concepts are presented. The course, as described in the course catalog, reads:

"An introductory course emphasizing the understanding of financial statements. Students will learn how to prepare, read, interpret, analyze and communicate financial information for making business decisions. Topics covered include a user perspective of the balance sheet, income statement, equity statement, cash flows statement, and their related accounts" (UMA catalog, 2008-2009). This description addresses the learning outcomes established by the CIS faculty in compliance with IS 2002. However, upon further investigation, we found that the actual course content has migrated into a more traditional curriculum geared primarily to accounting majors.

The typical traditional introductory accounting course is commonly taught as a ledger-based course (see Appendix 1) as is documented by a review of five of the most commonly used Introduction to Accounting college texts (Needles & Powers, 2007; Albrecht, Stice, Stice, & Swain, 2008; Spiceland, Thomas, & Herrmann, 2008; Warren, Reeve, & Duchac, 2008' Reimers, 2008). Although the traditional course offers students a macro based approach at some level, it places a higher degree of emphasis on detailed accounting activities. These activities are replete with debits and credits, and journal entries in many forms including original, adjusting, closing, and reversing entries. The course requires students to prepare various trial balances including unadjusted, adjusted, and post-closing trial balances. In addition, these detailed processes are reflected in the extensive accounting vocabulary used. Acronyms such as FIFO and LIFO (terms used as well by CIS in a different context) and others not so familiar such as DDB, MACRS, and SYD are just a few examples of an accountant's jargon. Although they roll comfortably off the accountant's tongue, they are infrequent in the conversation of CIS students who already have a language of their own.

This level of detail does not serve the CIS students' needs. Although knowing the accounting vocabulary is useful, systems analysts need to be able to see the big picture in order to implement technological improvements such as Enterprise Resource Planning (ERP) techniques which integrate all the firm's systems, including the accounting system, supply chain management system, and B2B. Missing from the traditional ledger based accounting course is a deeper working knowledge of the following three major concepts:

Financial Statements

It is important for systems analysts to have a solid understanding of the organization's financial statements. Their work directly impacts those statements which provide critical information about the organization's financial position to the organization's stakeholders.

Accounting Cycles

Understanding the way transactions move through the accounting information system allows the systems analyst to better understand internal control concepts, identify threats and implement sound financial technologies.

Financial Ratios

Understanding financial ratio analysis allows the systems analyst to communicate more effectively with the organization's managers, asking relevant questions and suggesting potential problem-solving methods. This development of strong communication and teamwork skills is essential to their success (IS 2002 Goal 3).

All of these skills contribute to the development of a well-rounded CIS student capable of meeting the needs of a company by understanding both the technical systems and the business concepts which drive the development of the systems.

Having determined that systems analysts should have a practical knowledge of financial activities, the next step is to identify which key accounting components in an introductory accounting course would best accomplish this goal. The proposed accounting course is consistent with the original Introduction to Accounting course description, provides a deeper, real world understanding of financial statements,

accounting cycles and financial ratio analysis, supports the development of an e-commerce platform for business, and reinforces the IS 2002 guidelines. The topics included in this proposed accounting course are as follows:

A. Understanding Corporate Ethics and Social Responsibility
   1. Sarbanes-Oxley Act
   2. FASB
   3. SEC
B. Understanding Financial Statements
   1. Income Statement
   2. Balance Sheet
   3. Statement of Cash Flows
   4. Statement of Stockholders' Equity
C. Understanding the Accounting Cycles: Activities/Threats/Controls/
   1. Revenue Cycle
      a. sales order entry
      b. shipping
      c. billing and accounts receivable
      d. cash collections
   2. Expenditure Cycle
      a. order goods
      b. receive and store goods
      c. approve and pay vendor invoices
   3. Production Cycle
      a. product design
      b. planning and scheduling
      c. productions operations
      d. cost accounting
   4. Human Resource Management/ Payroll Cycle
      a. employment practices
      b. payroll processing
   5. General Ledger and Reporting System
      1. all general ledger and reporting Activities
D. Financial Statement Analysis
   1. Profitability Ratios
      a. gross profit margin ratio
      b. net profit margin ratio
      c. rate of return on assets ratio
      d. rate of return on common equity ratio
      e. earnings per share ratio
      f. price earnings ratio
   2. Efficiency Ratios
      a. asset turnover ratio
      b. receivables turnover ratio
      c. inventory turnover ratio
   3. Liquidity Ratios
      a. current ratio
      b. quick ratio
      c. operating cash flows to current debt ratio
   4. Solvency Ratios
      a. debt to equity ratio
      b. times interest earned ratio
      c. operating cash flow coverage ratio (Romney, 2006)

The proposed accounting course is a hybrid of financial accounting and accounting information systems, and will provide a substantive understanding of the

- five accounting cycles: Revenue, Expenditure, Production, Payroll, and General Ledger and their relationship to financial statements and systems analysis,
- application of the current technology to maximize the efficiency of a company's accounting system,
- the ethical decision-making and socially responsible behavior that reflects the character of an employee. These learning outcomes are consistent with the goals of IS 2002.

An example of how a CIS student is able to apply what has been learned in the proposed accounting class can be demonstrated in the CIS classroom using Lightner's article, "Evaluating E-Commerce Functionality with a Focus on Customer Service." The Revenue Cycle (C1) is a key concept that would be taught in the proposed Introduction to Accounting Course. Lightner identifies 50 functional requirements for customer service in e-commerce. All of these refer to some aspect of the five accounting cycles. An example of customer service relating to the sales order entry activity within the Revenue Cycle and the ability to design and implement an accounting information system would include several of Lightner's functional requirements: notify customer of product availability; identify customer delivery address; place order; confirm order placement; provide general ordering information; display order charges (Lightner, 2004). This example, and many others tied to the proper design of internal controls, could then be expanded and reinforced with the student when taking the Systems Analysis course.

CIS students taking the proposed accounting course will learn that there are threats to these functional requirements such as

incomplete or inaccurate orders, credit sales to customer with poor credit, legitimacy orders, stockouts, carrying costs, and markdown. As well, they will learn of the control procedures and technologies which include data entry and edit checks; credit approval by credit manager; digital signatures and digital certificates for e-business, inventory control systems; and sales forecast (Romney, 2006). In addition, students will realize how their work impacts the Revenue Cycle which in turn affects the various financial statements and financial ratios of an organization. As students continue to develop proficiency in understanding the accounting system, and their role as a systems analyst, they will be able to contribute to their organization at a higher level. This deepens the system analyst's understanding of how the combination of problems, opportunities, and directives contributes to the development of an improved and efficient accounting system to support the strategies and goals of an organization including e-commerce.

In revising the introductory accounting course to include a more extensive study of financial statements, accounting cycles and financial ratio analysis, rather than the nuts-and-bolts approach in current use, may seem as though the business department is catering specifically to the needs of the CIS students at the expense of business students who need a deeper understanding of accounting functions. However, accounting majors may benefit by starting with this proposed course as well. A macro-based approach provides a solid foundation for the upper level courses geared toward majors in the field.

The added benefit of offering a proposed introductory accounting course to all students is that those who generally are not interested in accounting may find it more attractive and meaningful as it is relevant to the current business climate. Business departments may encourage more students to major in accounting and hold the interest of those who initially said it would be their major. (Meyer, 2004)
A proposed revision to the Introduction to Accounting course with a comparison to the traditional course is contained in Appendix 1 and 2.

4. CONCLUSION

Assessing learning outcomes in service courses presents a challenge as those courses are typically core courses in their own respective programs and may have different goals for its majors than the outcomes required by IS 2002 guidelines. In order to ensure that students are properly prepared for work in the Information Technology field CIS faculty must periodically review the learning outcomes of CIS courses, but also review required courses taught by other departments.

In reviewing the Introduction to Accounting course it became evident that alignment with IS 2002 guidelines requires a deeper working knowledge of financial statements, accounting cycles and financial ratio analysis. This is an alternative to the traditional introductory accounting course which typically has a stronger focus on detailed ledger tasks. The emphasis on integrating technology skills with a practical understanding of a company's financial systems positions the 21st century systems analyst to be a key player in the success of a company. It is hoped that the proposed course outline will be beneficial to other CIS departments when assessing their own accounting course requirements and learning outcomes.

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Appendix

Traditional Introductory Accounting Syllabus

Class	Topic
1	Introduction to Course
2	Link Between Business and Accounting
3	Preparing FS and Analyzing Transactions
4	AIS and the Accounting Cycles
5	Exam 1
6	Accrual Accounting
7	Reporting and Analyzing Inventory
8	Cash, Accounts Receivable and Bad Debt
9	Cash, Accounts Receivable and Bad Debt
10	Exam 2
11	Reporting and Understanding L/T Assets
12	Reporting and Understanding Liabilities
13	Reporting and Understanding Stockholders Equity
14	Preparing and Analyzing Statement of Cash Flows
15	Exam 3

Revised Syllabus for Proposed Course

Class	Topic
1	Overview of Accounting in Business
2	The Income Statement
3	The Balance Sheet
4	The Statement of Stockholders' Equity
5	The Statement of Cash Flows
6	Exam 1
7	Revenue Cycle
8	Expenditure Cycle
9	Production Cycle
10	Human Resource Management/Payroll Cycle
11	General Ledger Cycle
12	Exam 2
13	Profitability and Efficiency Ratios
14	Liquidity and Solvency Ratios
15	Exam 3