

## CLS Corporation: An Accounting Information Systems Case on Fundamental Concepts and Business Processes

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### Abstract

Accounting information systems courses fall into two general categories: traditional and database-oriented. In traditional courses, students may learn about flowchart development, business processes, transaction processing and internal controls; database-oriented courses often deal with REA models, database design and related internal controls. This two-part case is suitable for use in either type of course. The first part presents a short narrative of a fictitious consulting firm, including a description of its business processes and current clients. Students are asked to prepare a systems flowchart, create a relational database and suggest internal controls based on perceived risks. In the second part, students are asked to consider accounting-related issues associated with a merger and the human resources business process.

**Keywords:** accounting information systems, flowchart, database design, internal control, case study, human resource process, compensation, spreadsheet analysis

### Adaptability

This paper has presented a case assignment suitable for use in most accounting information systems courses. The case has been implemented successfully multiple times, providing students with a challenging assignment that applies AIS course material in a realistic context.

### I. Introduction

This case is divided into two parts. While related, the parts are independent of one another and could be used separately or together. The first part of the case features assignment questions that require students to prepare a flowchart, design a relational database, analyze the firm's risk exposures and suggest related internal controls; the second part of the case focuses on the human resources business process, with particular attention to compensation issues. The paper is organized into a brief literature review, the case narrative (divided into two parts), and assignment questions. Although the two parts of the case can be used independently, they are most effectively used in connection with one another.

### II. Literature review

The literature review examines the following topics: critical thinking in the accounting curriculum, prevalence of the case topics in AIS courses and application of the case topics in accounting practice.

#### Critical thinking in the accounting curriculum

Critical thinking is not a new concept. The Accounting Education Change Commission (AECC) in 1990 stated that "A strong fundamental understanding of accounting is necessary for successful accounting careers. This understanding includes 1) the ability to identify goals, problems, and opportunities, 2) the ability to identify, gather, measure, summarize, verify, analyze, and interpret financial and nonfinancial data that are useful for addressing the goals, problems, and opportunities, and 3) the ability to use data, exercise judgments, evaluate risks, and solve real-world problems. The focus should be on developing analytical and conceptual thinking, not on memorizing professional standards." In 1999, the American Institute of Certified Public Accountants (AICPA) defined strategic critical thinking within their Core Competency Framework as "encompassing the ability to link data, knowledge, and insight together from various disciplines to provide information for decision making". The expectation

is that accountants entering the field will possess the skills to “communicate to others the vision, strategy, goals, and culture of organizations.” Elements of critical thinking include the ability to:

- identify strengths, weaknesses, opportunities, and threats involved in a situation;
- identify and research a variety of data from different sources that can be used in analyzing a decision
- apply knowledge from one situation to another.

Both organizations recognized that critical thinking skills are highly valued within the business community, which resulted in a challenge to educators to provide students with opportunities for using and developing critical thinking skills. There is no generally accepted definition of critical thinking in the accounting profession, which adds to the challenge for educators (Wolcott, Baril, Fordham, Cunningham, St. Pierre, 2002). The reader is referred to Wolcott et al extensive review of the critical thinking literature in accounting.

Young and Warren (2011) noted that active learning methods such as peer interaction, cases and experiential learning have been linked to increased retention of concepts and development of critical thinking skills. Ballantine, Duff and Larres, (2008) found that case studies improve students’ approach to learning, in part because students spend more time working on cases than other exercises. Fordham (2008) noted that cases are popular and effective teaching tools as indicated by the large number of case materials submitted to accounting systems publications. This observation was supported by Apostolou, Dorminey, Hassell and Watson (2013) in their literature review which found that 26.3% of the publications in accounting education during the years 2010-2012 are instructional cases.

**Prevalence of the case topics in AIS courses**

The undergraduate accounting curriculum has been structured similarly for many years: two courses in introductory accounting, a series of required courses covering the major areas of the field and one or more specialized electives. Accounting information systems (AIS) is a relative newcomer to the second group; indeed, many accounting academics today were not exposed to AIS until graduate school, if at all. Thus, as noted by Murthy and Ragland (2009), “Compared to other specialty fields within accounting such as auditing and tax, AIS is less well understood in terms of its common body of knowledge.”

Although the content of and approach to AIS courses is very diverse, a few common topics are featured in many courses. Bain et al. (2002) analyzed AIS course syllabi prior to the passage of the Sarbanes-Oxley Act of 2002. They drew the following conclusions about the topics covered in the first part of the CLS case based on their analysis of 46 AIS syllabi:

Topic	% of syllabi covering	Average % of class time
Internal control	97.8	11.7
Systems documentation	73.9	6.6
Database management systems	65.2	5.2
REA modeling	0	0

In a later study that compared the content of AIS and MIS courses, Murthy and Ragland (2009) performed a similar analysis on 50 AIS syllabi after the passage of SOX, yielding the following results for case-related topics:

Topic	% of syllabi covering	Average % of class time
Internal control	97.9	15.7
Systems documentation	91.7	9.0
Database management systems	75.0	5.4
REA modeling	39.6	3.8

Thus, the four major topics in the CLS case represent significant areas of study in many AIS courses, with all four showing increases over time. Murthy and Ragland (2009) also found that 14.6% of analyzed syllabi included “practice problems” as a course project, with an average of 1.9% of class time devoted to them.

Therefore, the CLS Corporation case discussed below could be used effectively in many AIS courses. Since it includes concepts related to both traditional and database-oriented AIS, it is adaptable to both introductory and advanced courses in the field.

#### **Application of the case topics in accounting practice**

Not only are the topics treated in the CLS case widely used in AIS classrooms; they are also important in accounting practice. For example, Corey and Huttenhoff (2011) surveyed “2,300 individuals who were either (1) members of a large, regional south Texas CPA society, (2) members of the IMA in the same area or (3) employers who had interviewed students on campus during the previous three years.” Their survey yielded the following results:

- In a ranking of 22 courses commonly included in the undergraduate accounting curriculum, information systems courses were ranked fifth, with a mean importance of 3.2 on a 4-point scale.
- In a ranking of 18 skills that are or could be developed in undergraduate accounting courses, critical thinking was first, with a mean ranking of 4.5 on a 5-point scale. Written communication ranked second, with a mean ranking of 4.4. The CLS case helps students develop both critical thinking and written communication skills. If assigned as a group project, the case would also develop students’ teamwork skills, which ranked #5 on the list with a mean of 4.1.

In a related, but different, study, Cory and Pruske (2012) provided important contextual background regarding curriculum recommendations for accounting programs. They referenced classic documents whose promise has largely gone unfulfilled, such as the 1986 Bedford Committee Report, the (then) Big 8 white paper titled “Perspectives on Accounting Education,” and Albrecht and Sack’s 2000 study titled “Accounting Education: Charting the Course Through a Perilous Future.” Cory and Pruske surveyed practicing accountants from both public and non-public sectors, querying them specifically about necessary skills in the profession. Use of database software, one of the topics in the CLS case, had a mean rating of 2.1 from public accountants and 2.4 from non-public accountants on a 3-point scale. Information technology security and controls had a mean rating of 2.0 from public accountants and 2.1 from non-public accountants. In both cases, Cory and Pruske found a statistically significant difference between the two groups.

Finally, Chambers and McDonald (2013) “conducted in-depth interviews with a collection of leading chief audit executives at global companies across several industries.” Their work resulted in a list of attributes seen in highly effective internal auditors, many of which are developed by the CLS case. Those skills include communication, teamwork (if the case is assigned as a group project) and continuous learning.

Depending on assignment specifics, additional important skills could be developed by using the CLS case in an AIS course; those additional skills will be identified and described in the teaching notes. The next sections of the paper present the narrative and assignment questions for each part of the case.

**Case narrative: Part One**

CLS Corporation is a management consulting firm specializing in accounting-related matters. The corporation has three levels of consultants: assistant, associate and senior. In general, new employees start as assistant consultants, although occasionally someone with prior experience will start as an associate. Based on annual performance reviews and length of employment with CLS, employees move up after three years in a given rank.

The firm has four areas of expertise: activity-based systems, balanced scorecard, enterprise risk management and AIS design. Each consultant is required to have expertise in at least two areas at the assistant and associate levels; to move up to senior consultant, an employee must add a third specialization. No employee currently has, or will ever have, expertise in all four areas.

The table below presents data on CLS employees as of February 1, 2011:

Name	Employee ID	Starting year	Level	Expertise areas
Timothy Chiu	128	2008	Associate	activity-based systems, balanced scorecard
Samantha Delgado	123	2011	Assistant	balanced scorecard, AIS design
Pat Fan	143	2004	Senior	AIS design, balanced scorecard, enterprise risk management
Linda Smith	106	2005	Senior	AIS design, activity-based systems, enterprise risk management
John Torres	111	2005	Senior	AIS design, balanced scorecard, activity-based systems

Consultants work in teams of two; at least one team member must be a senior consultant. CLS maintains a strict limit of five consulting engagements at any one time; each consultant can be on no more than three teams simultaneously.

When an engagement request comes in, the senior consultants review it for appropriateness and capacity. If the engagement is not accepted, CLS sends a thank-you letter to the prospective client, explaining the reason(s) they must decline.

If the engagement is accepted, one senior consultant volunteers to take the lead and chooses one other team member (subject to the constraints noted above). The team then meets with the client to develop a requirements specification which specifies a timeline and specific deliverables. The team then develops a fee estimate, which the client may approve or reject. If the fee estimate is rejected, CLS declines to perform the work; if the client accepts the fee estimate, CLS collects half the fee in advance. The client is billed for the remaining half when the project is finished.

Here is a list of CLS engagements as of February 1, 2011:

Client name	Area	Staff	Total fee	Start date	Project duration (months)
ACS Corporation	enterprise risk management	Fan & Smith	\$ 30,000	12/15/2010	10
RCC Corporation	scorecard	Torres & Chiu	15,000	1/20/2011	6
CSF Corporation	AIS design	Smith & Delgado	22,000	9/1/2010	20

During February 2011, CLS received the following new consulting requests:

Client name	Area	Total proposed fee	Start date	Project duration (months)
DRC Corporation	tax research	N/A	N/A	N/A
URT Corporation	enterprise risk management	\$ 25,000	3/1/2011	8
MKS Corporation	AIS design	27,000	2/15/2011	18

CLS followed its customary procedures to evaluate the requests; MKS rejected the fee estimate, while URT accepted theirs. Torres and Delgado will work together on the URT project.

**Assignment questions: Part One**

1. Prepare a systems flowchart of CLS’ proposal evaluation process.
2. Design and populate a normalized relational database capable of tracking accepted consulting engagements. In addition to appropriate tables, the database must include:
  - a. A report showing the information listed below for each current project (this report must be based on a query):
    - i. Client name
    - ii. Lead consultant’s name
    - iii. Expected completion date (For simplicity, assume every month has 30 days.)
    - iv. Total amount to be billed upon completion.
  - b. A form CLS would use to assign a lead consultant to a new project.
3. List and discuss three risk exposures CLS faces. Suggest internal controls to address each risk, clearly explaining how each control is related to the risk.

**Case narrative: Part Two**

Given the amount of available consulting work, CLS management decides to merge with SMC, another small management consulting firm that specializes in accounting-related matters. The data on the employees after the merger is as follows:

	Emp ID	Starting Date	Level	Expertise Areas	Salary
Samantha Delgado	123	2011	Assistant	balanced scorecard, AIS design	\$68,457
Timothy Chiu	128	2008	Associate	activity-based systems, balanced scorecard	72,300
Pat Fan	143	2004	Senior	AIS design, balanced scorecard, enterprise risk management	90,800
Linda Smith	106	2005	Senior	AIS design, activity-based systems, enterprise risk management	89,105
John Torres	111	2006	Senior	AIS design, balanced scorecard, enterprise risk management	92,500
Amy Alvarez	150	2011	Assistant	balanced scorecard, AIS design	60,750
Eduardo Sanchez	154	2011	Assistant	activity-based systems, AIS design	65,150
Tom Chan	153	2008	Associate	activity-based systems, balanced scorecard	71,000
Pam Fitzgerald	151	2004	Associate	enterprise risk management, activity based systems	69,425
Lynn Saunders	152	2006	Senior	activity-based systems, balanced scorecard, enterprise risk management	73,300
Patty Jones	155	2004	Senior	AIS design, balanced scorecard, enterprise risk management	75,375
Tyler Simmons	156	2005	Senior	AIS design, activity-based systems, enterprise risk management	86,000

The president of CLS believes that the consultants should be paid not less than the median of similar consultants in the area, but preferably within the 75<sup>th</sup> – 90<sup>th</sup> percentile. Salary information compiled by an administrative assistant appears below:

	25 <sup>th</sup>	Median	75 <sup>th</sup>	90 <sup>th</sup>
Assistant Accountant	\$44,987	\$49,887	\$55,262	\$60,155
Associate Accountant	\$53,812	\$59,702	\$66,297	\$72,302
Senior Accountant	\$65,990	\$73,371	\$81,607	\$89,105

**Assignment questions: Part Two**

1. Using spreadsheet software, prepare an analysis which shows, for each consultant:
  - a. Their salary amount
  - b. Whether the salary is within the 75<sup>th</sup> – 90<sup>th</sup> percentile
  - c. If the salary is not within the 75<sup>th</sup> – 90<sup>th</sup> percentile, whether it is greater than the median and the amount by which it differs from the 75<sup>th</sup> – 90<sup>th</sup> percentile.
  - d. The average salary within each position level (assistant, associate, senior)

2. Based on that analysis, respond to the following questions:
  - a. Is there a difference in pay between accountants originally employed by CLS and SMC?
  - b. What, if any, adjustments should be made to salaries? Explain your response.
  - c. If the changes are made, what would be the cost to CLS?
  - d. Are there differences in pay that appear to be based on factors other than expertise or length of service? If so, what risk exposures does CLS face? What internal controls would you recommend to mitigate them?

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