The Buck Does Not Stop Here: A Case on Dynamic Technologies and Skills That Drive the Need for Lifelong Learning for Accounting Students

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This SME (small and medium-sized enterprise) focused case study is designed to support recent graduates specifically entering internal accounting positions with an emphasis on the following STEM-related topics: Data Security & Management, Internal Controls, COBIT Framework, ERP deployment, Business Intelligence, and Emerging Technologies. Working for SMEs, learners may face unique related challenges. For instance, some SMEs outsource various support functions. This budgetary decision can leave the internal organization technically void of critical strategic knowledge and skills and highly dependent upon outside members for this support. What if there were a better way? In this case, students will be introduced to a related fictional business case to develop their critical thinking and business problem-solving skills while developing a life-long learning toolkit to enhance their future technological knowledge.

Keywords: lifelong learning, accounting information systems, career readiness, data analytics, business intelligence

CASE PROMPT

Introduction

So, What Went Wrong?

SMEs in start-up and fast growth cycles may find themselves desperately needing professional administrative assistance without the budget for full-time support. This was the case of a small construction company specializing in roofing installation in the early 2000's. The two owners of Roof Masters met during a sales call for an HOA request for roofing. One eventual owner arrived early and provided exceptional service, culminating in sending the bid, as promised. The other owner marveled at the stark contrast with competing sales representatives who arrived late, did not show or call, or simply neglected to

send a bid. The pair talked about the challenges of receiving "good service" from many construction companies, which led to the idea of going into business together. Soon after, the two built Southern California's second largest roofing company. Fast forward a decade later, the company had gone public and back to private, struggled through the 2008 financial crisis, and eventually closed its doors after a bitter partnership feud ended in bankruptcy. So, what went wrong?

Background

Beginnings

Roof Masters launched their business from one of the owner's garages with a pick-up truck, scheduling book, phone, and a few bundles of material. The advertisements placed in residential home magazines quickly yielded a high sales rate, appointments, and closings. The owners hired their wives to run the back office by answering phones and handling other administrative tasks carefully. The owners then split responsibilities as one ran the sales calls while the other ran the fabrication and installation of the product. The pair delivered on their customer promises 100% of the time, quickly enhancing their brand recognition. The owners also signed a significant exclusivity deal with a local supplier to offer the highest-quality roofing materials to be customized for each home with a lifetime guaranty. This product and service differentiation strengthened their quality reputation. After two years of hard work, the owners had built the company into a reputable force in the roofing industry. Hiring mostly family allowed the company to remain agile and instilled a sense of employee pride in the company's mission. However, the pressures of running a business eventually led to exhaustion and squabbles.

As the firm grew, the owners' inexperience prompted them to outsource strategic management, accounting, human resources, and information technology support. Roof Masters contracted with Sutiva, a professional employer organization (PEO) based out of Indiana with remote offices in Orange County, to help the company build their administrative infrastructure. The CEO of Sutiva negotiated a deal at .5% of Roof Masters' sales plus fees for an exclusive payroll and human resource product that a team of local HR representatives could manage. The Roof Masters owners took comfort in having a qualified strategic partner to grow their company. As part of Sutiva's premier strategic package, a local part-time CFO would visit the company weekly to prepare financial statements, budgets, and hiring recommendations.

Greedy Bookkeeper

Rising tensions prompted the owners and their wives to hire non-family for the new roles. This caused a major shift in organizational structure as the new board comprised two Sutiva executives, the company's CPA, and the two owners. The owners also held the roles of CEO and COO, focusing on managing sales and operations, respectively. After navigating these high-level changes, the owners contacted friends to fill additional positions for the expansion. Based on guidance from Sutiva, the hiring included the following positions: sales manager, operations manager, bookkeeper, sales staff, installation staff, fabricators, and receptionist. The CFO drafted organizational charts, job descriptions, and training materials for the transition.

One of Roof Masters' earliest hires was a full-charge bookkeeper to assist the CFO with data entry and financial reporting. With limited visits to the location, the CFO relied on the bookkeeper to record sales entries, manage cash receipts, and prepare deposits. The CEO took the prepared deposits to the bank daily and gave the receipts to the bookkeeper to record and file. The company managed its spending primarily through a business credit card, which the bookkeeper reconciled monthly. Within months of hiring the bookkeeper, the CFO found several discrepancies in the reconciliations. With a clean background check, Sutiva and the owners had no reason to suspect the bookkeeper of fraud. However, a customer eventually told the CEO that their bank refused to cash a check that had been modified to add the bookkeeper as payee. Further investigation revealed that the bookkeeper had tried to cover up this ongoing fraud by altering invoices in the accounting software. After navigating the review and termination of the bookkeeper, the owners became increasingly concerned over the hiring process for the accounting function.

In conjunction with Sutiva's HR representative, the executives created a new upper-level accounting manager position. After several interviews, the company hired a recent accounting undergraduate with

previous full-charge bookkeeping experience. After a three-month probation period, the candidates' strong performance as accounting manager exceeded expectations. In addition to maintaining the accounting function by using a basic accounting information system, the accounting manager also developed a manual sales approval and job costing system using handwritten contracts and job records to improve controls.

The accounting manager also developed a dashboard using Excel to help executives and managers quickly track weekly firm performance. The accounting manager undertook the cumbersome process of preparing these reports by gathering the following information from various sources:

- CRM (customer relationship management software): marketing performance, sales pipeline, and closing ratios.
- Giant whiteboard in operation manager's office: installation scheduling detail for revenue recognition timing and install pipeline determination.
- Handwritten fabrication records: for total materials costs used per job.
- Payroll timecards: for estimated labor hours used per job.
- Manilla job folders: job status notes made by sales and operations manager.
- Job cost summaries: manually prepared in Excel to calculate job cost variances.

The managers and owners met weekly to discuss the progress and plan for the rolling four weeks of installations, as new contracts required special ordering, fabrication, installation, and completion. Early errors in dashboard reporting arose due to miscommunications and an increased demand for timely information despite the lack of timely updates to the whiteboard. Newly hired operations and accounting clerks assisted the accounting manager in improving the information gathering process.

After discussions with the CFO about variances in variable costs, the accounting manager implemented monthly periodic inventory counts to monitor these levels against the reported usage on job cost records and standard usage per square foot of installation. Due to the lack of a thorough job cost module in the existing accounting information system, the accounting manager relied on the clerk to help maintain detailed job cost records in Excel.

Despite the challenges with navigating multiple sales, operations, and accounting systems, the accounting manager provided monthly financial statements that clearly showed volatility in gross profit. This warranted a closer look into the work of the operations manager who had resisted the new systems by ignoring critical and time-sensitive requests for information. It was clear that something was amiss and, soon after these new control procedures were implemented, another major fraud was discovered.

Betrayal of a Friend

The owners worked hard to find trustworthy individuals for the sales manager and operations manager positions. Working under the guidance of Sutiva's HR representatives, the COO hired a close family friend to be the operations manager and oversee the fabrication and installation departments. This role required strong communication, management, and logistics skills. Over time, the new operations manager forged close relationships with the installation crews. While the primary role of sales fell under the sales team, installers would regularly be approached to take on "side jobs" or small additions to the contracts. The protocol required the installers to contact the assigned sales representative to bid the work. Depending on the size of the work, customers typically complained about the high change order price for these minor additions and failed to sign the change order contracts. The fraud began as a group of opportunistic installers began conspiring with the operations manager to bypass the sales department and handle this work "on the side."

Even while breaking installation sales records and improving efficiencies in the department, the operations manager was also stealing materials and labor by fabricating and installing the side deals on company time. Ultimately, through their job costing efforts, the accounting department detected over a hundred thousand dollars in theft. Sutiva HR representatives handled the formal investigation, and the operations manager was terminated once enough evidence was gathered. The fraud severely damaged company morale as no one had expected the owner's close friend and nearly fifty percent of the installation staff to engage in such audacious behavior.

At the time of the discovery, the COO had been on leave after having major surgery. Learning of the betrayal while unable to return to work, the executive had to act quickly. The accounting manager was promptly promoted to interim COO since they had learned the standards of preparing jobs for fabrication and installation while developing the inventory and costing systems. While in this role, additional checks and balances were developed and an operations manager and several installation crews were hired. In time, the owner returned from leave with a newly trained operations department and the accounting manager/interim COO was promoted to controller.

The Boom

After recovering from the betrayal of the previous operations manager, the company's effective marketing and continued high-quality service helped Roof Masters improve its revenue. This sales growth prompted the company to hire an extravagantly paid marketing consultant to improve the sales process and marketing ROI. As Roof Masters grew, the company executives addressed its critical need for updated computers, databases, and a secure network. The controller relied on information learned in a recent accounting information systems course to assist with interviewing IT consultants to help with these needs.

The owners, managers, and consultants held monthly strategic meetings geared toward further expansion efforts. Owners were forced to provide clear direction, mediate clashes between management and consultants regarding the prioritization of growth initiatives, and handle conflicts among managers competing for project resources. Despite these disruptions, the IT consultants implemented a shared network, allowing for some automation and remote file sharing. The sales and IT consultants also improved the website and implemented a bridge between the CRM and accounting information system to mitigate duplication of data entry. These overall improvements in infrastructure and processes helped the company create a value-driven experience for customers, which led to an acceleration of sales growth.

The accounting department continued to improve the manual systems of job costing and reporting. Each completed project was reviewed for cost variances and the managers were held accountable for discrepancies in their budgets by the CEO at the weekly meeting. These reports sparked heated discussions around the need for improvement in the sales, installation, purchasing, and scheduling processes. Despite the assistance of the accounting clerk, as the company expanded the manual job costing process proved unstainable-- resulting in longer workdays and reporting delays. The controller and IT consultants sought out potential solutions and recommended several rightsized ERP systems to bridge the sales, accounting, and operational data into one centralized database. However, the owners decided to pause the project and, instead, pressured the accounting manager to continue to deliver timely reports, despite these issues.

Roof Masters continued expanding by opening sales centers in three surrounding counties. Sutiva executives noticed the continued sales growth at Roof Masters and offered additional expertise through pitching IPO (initial public offering) or franchising strategies. The management team was concerned that the owners were acting hastily in considering either strategy and should instead focus on solidifying team building and implementing process improvements and a reliable central database. However, Sutiva's lofty expansion forecasts demonstrated a clear path to early retirement and the owners worked with the company's legal team to determine the best path forward. Sutiva's executives negotiated higher fees over fancy dinners with the owners, and despite the warnings of the controller, plans were made to expand the company nationally. The part-time CFO relied heavily on the controller to prepare the company for the initial public offering to raise funds for expansion. External auditors were hired to inspect the accounting records and, with the accountants and legal team on board, the company embarked on a reverse merger to go public—thus, speeding up the process and saving costs on an IPO transaction.

Conclusion

The Bust

Less than a year after the decision to go public, the 2008 financial crisis emerged, and Roof Masters was hemorrhaging funds on increased professional fees and failing operations in two of the four counties. The legal team helped the company sell off the public shell and revert to being a private firm. Employees, friends, and family lost much of their investment in the company as legal, accounting, and other fees

mounted as revenue fell. The organization consequently underwent a major reorganization and the CEO and COO returned to work as sales and operations managers with significant pay cuts. With long-term leases signed at the new locations, the company was forced to sustain hefty expenses during recovery. Crippled by these high fixed costs, the company terminated contracts with Sutiva which meant letting go of their long-term CFO. The owners also abruptly canceled contracts with the marketing and IT consultants.

Furthermore, employee morale was so badly damaged for the remaining employees due to their failed personal investments in the IPO that half of the sales representatives left to start a competing company. The controller also resigned due to the rising tensions among the owners and burnout due to the massive loss of human capital. The company once near the peak of the roofing industry eventually dissolved in bankruptcy despite the efforts of experts at Roof Masters**. So, what went wrong?**

Case Questions

1. ***Make the Connection:*** How do the course and weekly learning objectives posted in the syllabus and module overviews of this AIS course relate to this case? (Hint: course learning objectives are summarized on the first page of the syllabus for you).
2. ***Internal Controls:*** Based on your understanding of the COSO internal control and risk frameworks, what are the top five risks for Roof Masters and why?
3. ***COBIT:*** Based on your understanding of the COBIT framework, what are the top five information system and security concerns for Roof Masters and why?
4. ***Data Management:*** Based on your understanding of Data Management, what are the top five reasons for Roof Masters to implement an ERP and why?
5. ***Business Intelligence and Emerging Technologies:*** Based on your understanding of business intelligence and emerging technologies, how might the deployment of these technologies improve decision-making and overall operational efficiencies for Roof Masters?
6. ***Business Processes:*** Based on your understanding of BPMN and business process, what are the top five process improvement recommendations for Roof Masters and why?
7. ***Build a Lifelong Learner Toolkit***
    a) Reflect on the key aspects of the case and your personal learning journey in this course.
    b) Based on the professional organizations introduced in class (AICPA, CalCPA, IMA, IIA, ISACA, AAA, COSO) consider what resources are available.
    c) Compile a list of five quality websites that offer CPE for accountants and foster lifelong learning.
    d) What certifications would you recommend for the Roof Masters controller and why?
8. ***Optional: Podcast to Learn:*** Virtual presentation skills are an in-demand skill to master. In place of a traditional presentation, create a 5-minute podcast introducing one of these four topics: (1) data management, (2) business intelligence, (3) emerging technologies, (4) or risk and controls frameworks to entrepreneurs.
    a) Develop a script for your podcast message.
        i. Start with a "hook" (why is the tool needed?),
        ii. explain key benefits of the tool,
        iii. explain the dangers of not adopting the tool,
        iv. end with advice for "getting started" on learning technology.
    b) Create a slide for your screen share showing your professional-brand profile or fictitious company name and logo.
    c) Share your slide and record your presentation on Zoom.

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APPENDIX

FIGURE 1
BUSINESS CANVAS MODEL

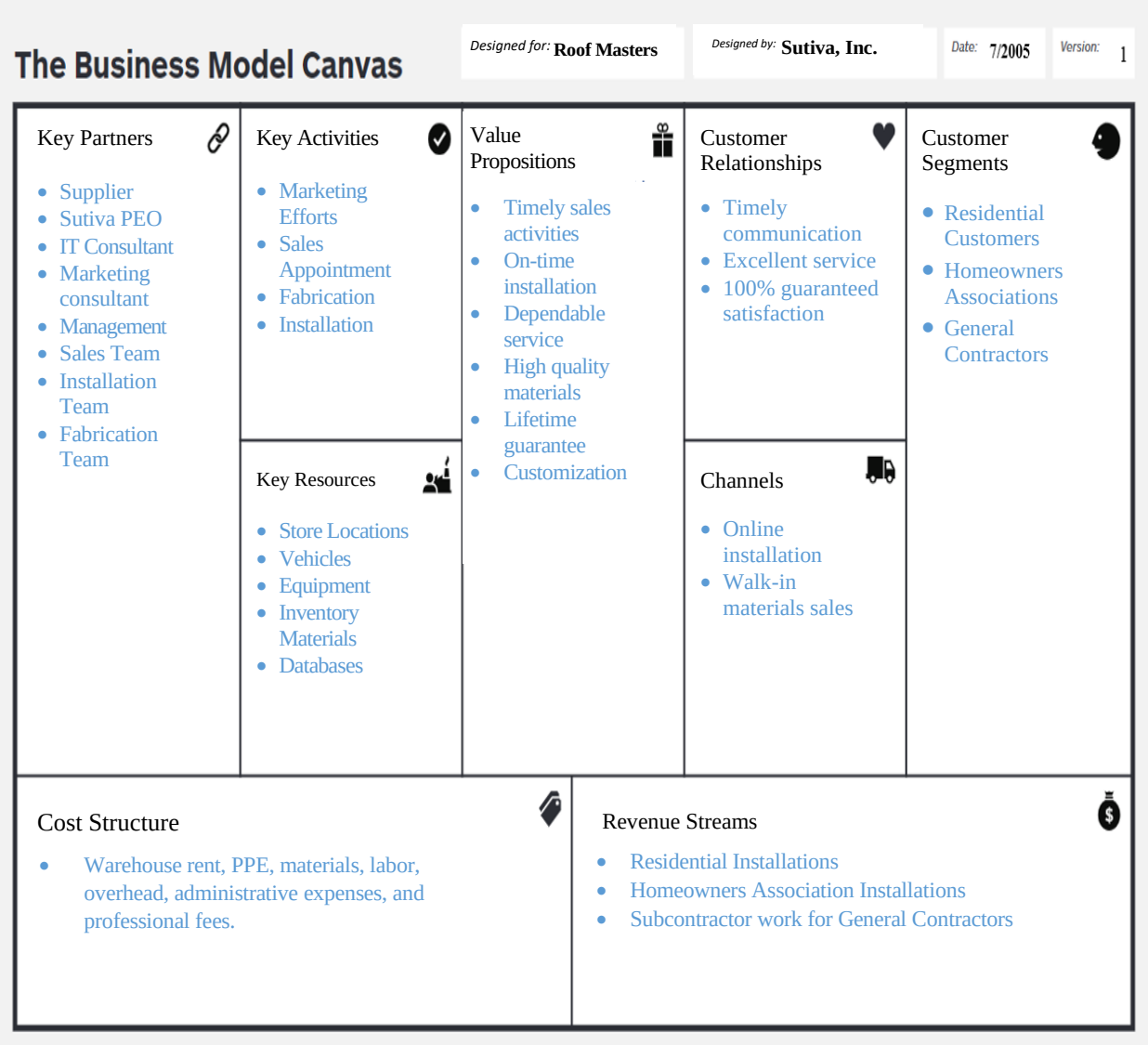


FIGURE 2
ORGANIZATIONAL CHART DURING HIGH-GROWTH STAGE

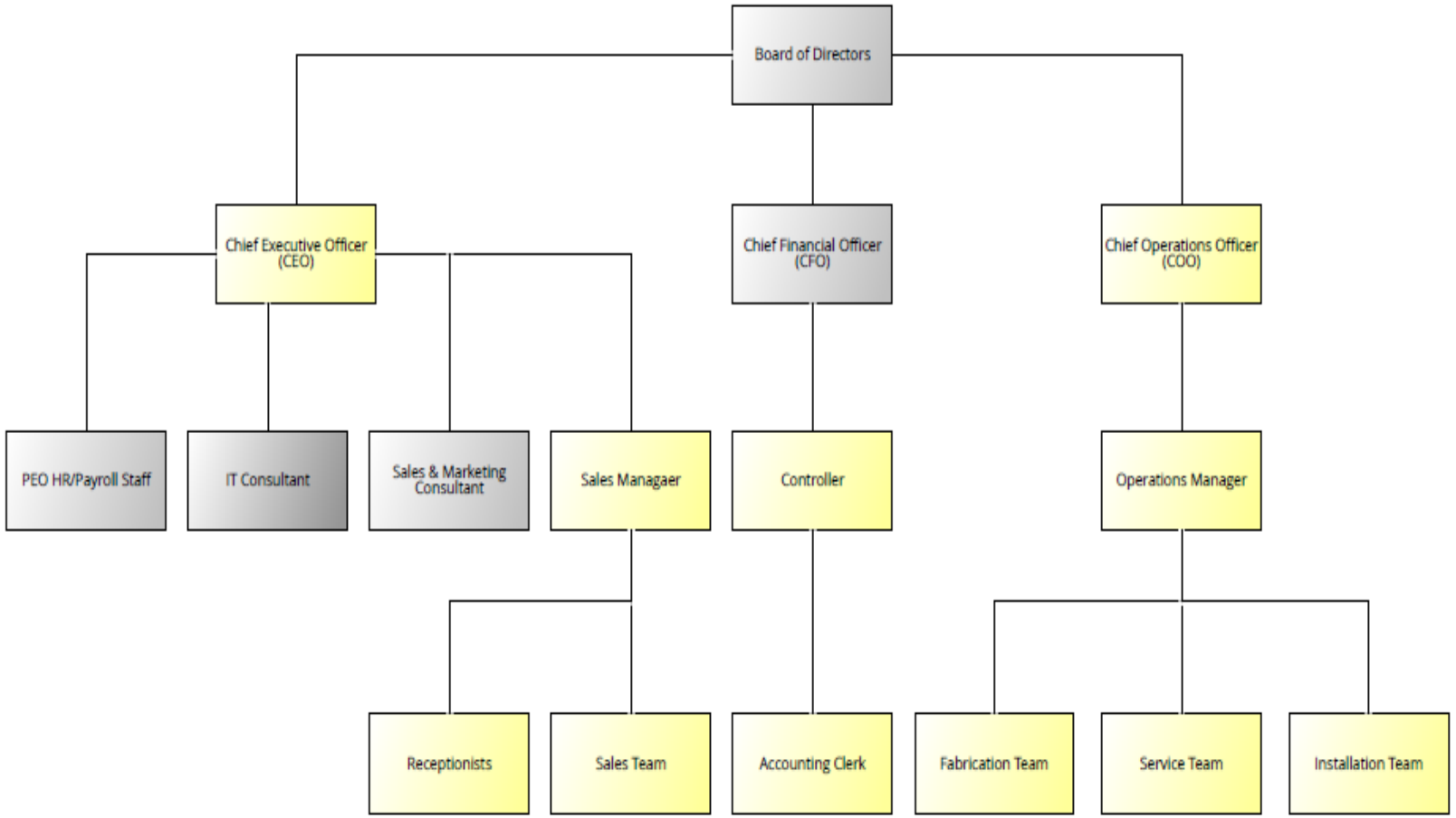


TABLE 1
FINANCIAL DATA

2006	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Sales	$403,568	$425,001	$432,503	$427,350	$ 426,535	$487,253	$489,345	$ 507,223	$425,321	$438,261	$ 526,123	$578,231
Variable Costs	209,855	221,001	224,902	222,222	234,594	267,989	269,140	263,756	221,167	227,896	273,584	300,680
Contribution Margin	193,713	204,000	207,601	205,128	191,941	219,264	220,205	243,467	204,154	210,365	252,539	277,551
Fixed Costs	179,350	179,350	178,623	181,265	186,264	187,215	188,245	184,631	182,899	204,124	208,126	210,246
Operating Income	$ 14,363	$ 24,650	$ 28,978	$ 23,863	$ 5,677	$ 32,049	$ 31,960	$ 58,836	$ 21,255	$ 6,241	$ 44,413	$ 67,305

2007	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Sales	$578,231	$592,624	$601,320	$594,782	$ 627,789	$681,351	$725,135	$ 765,128	$814,344	$701,211	$ 571,546	$443,512
Variable Costs	300,680	308,164	312,686	309,287	326,450	354,303	377,070	397,867	423,459	364,630	297,204	230,626
Contribution Margin	277,551	284,460	288,634	285,495	301,339	327,048	348,065	367,261	390,885	336,581	274,342	212,886
Fixed Costs	261,426	265,123	263,125	282,461	286,431	281,343	282,414	281,231	301,313	300,145	301,311	284,586
Operating Income	$ 16,125	$ 19,337	$ 25,509	$ 3,034	$ 14,908	$ 45,705	$ 65,651	$ 86,030	$ 89,572	$ 36,436	$ (26,969)	$ (71,700)

2008	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Sales	$403,568	$365,281	$351,423	$302,456	$ 318,465	$330,211	$321,456	$ 303,123	$325,131	$318,246	$ 312,513	$330,132
Variable Costs	209,855	189,946	182,740	157,277	165,602	171,710	167,157	157,624	169,068	165,488	162,507	171,669
Contribution Margin	193,713	175,335	168,683	145,179	152,863	158,501	154,299	145,499	156,063	152,758	150,006	158,463
Fixed Costs	235,464	225,416	215,314	212,485	213,872	214,654	215,345	216,247	212,465	202,132	200,135	200,143
Operating Income	$ (41,751)	$ (50,081)	$ (46,631)	$ (67,306)	$ (61,009)	$ (56,153)	$ (61,046)	$ (70,748)	$ (56,402)	$ (49,374)	$ (50,129)	$ (41,680)

FIGURE 3
WORKFLOW DIAGRAMS – JOB CONTRACT PROCESS

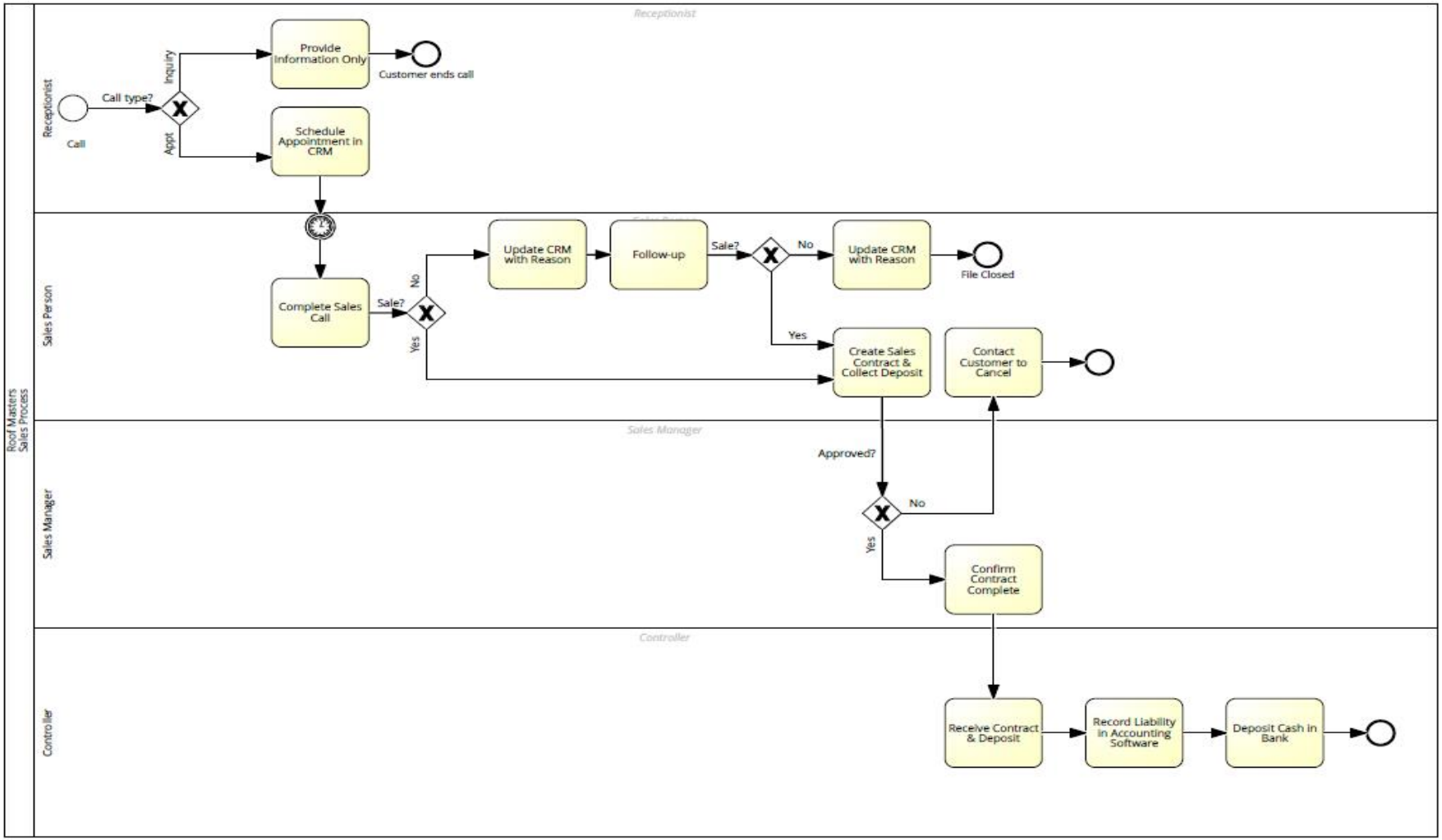


FIGURE 4
WORKFLOW DIAGRAMS – PURCHASE PROCESS

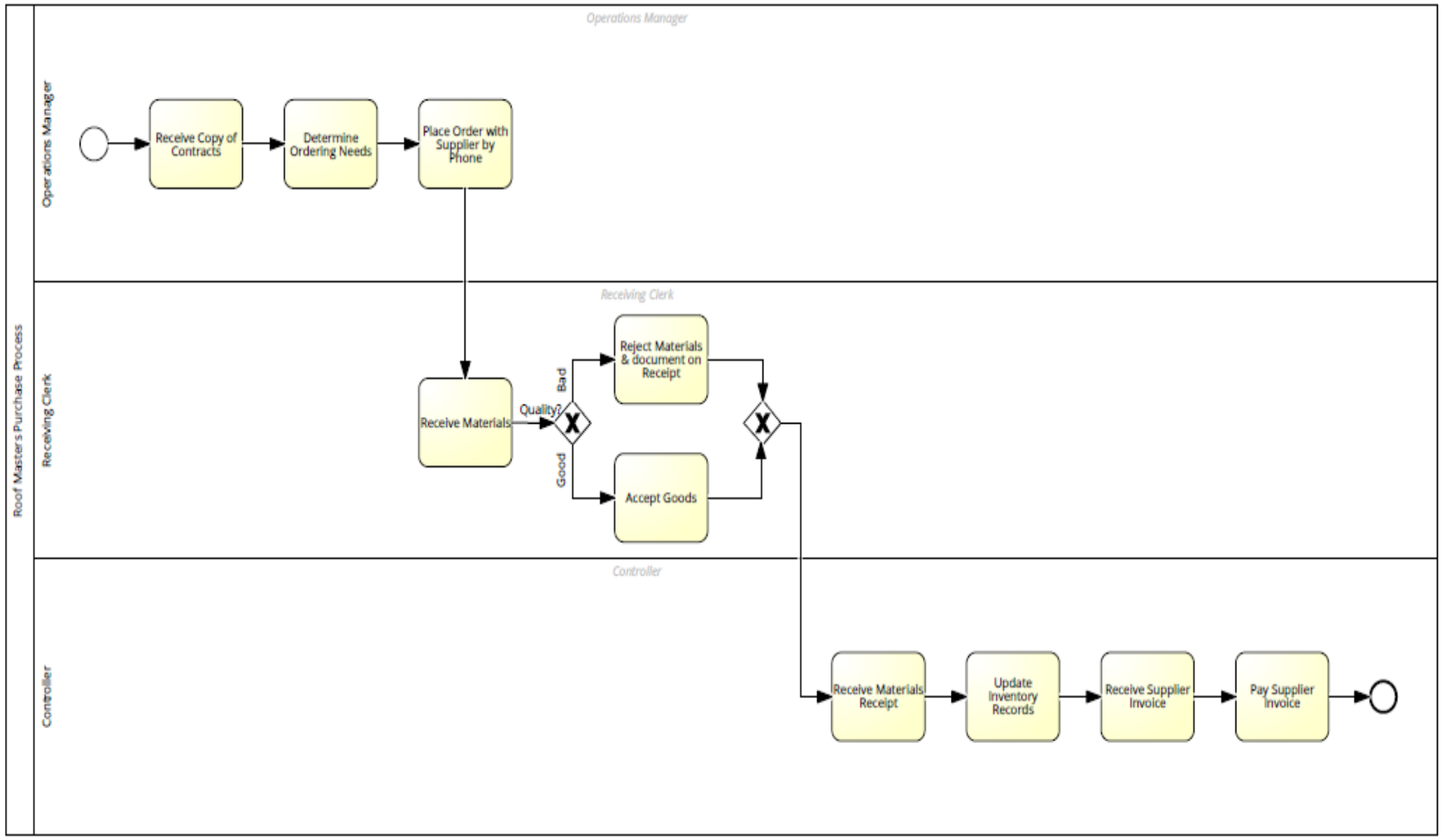


FIGURE 5
WORKFLOW DIAGRAMS – FABRICATION AND INSTALLATION PROCESS

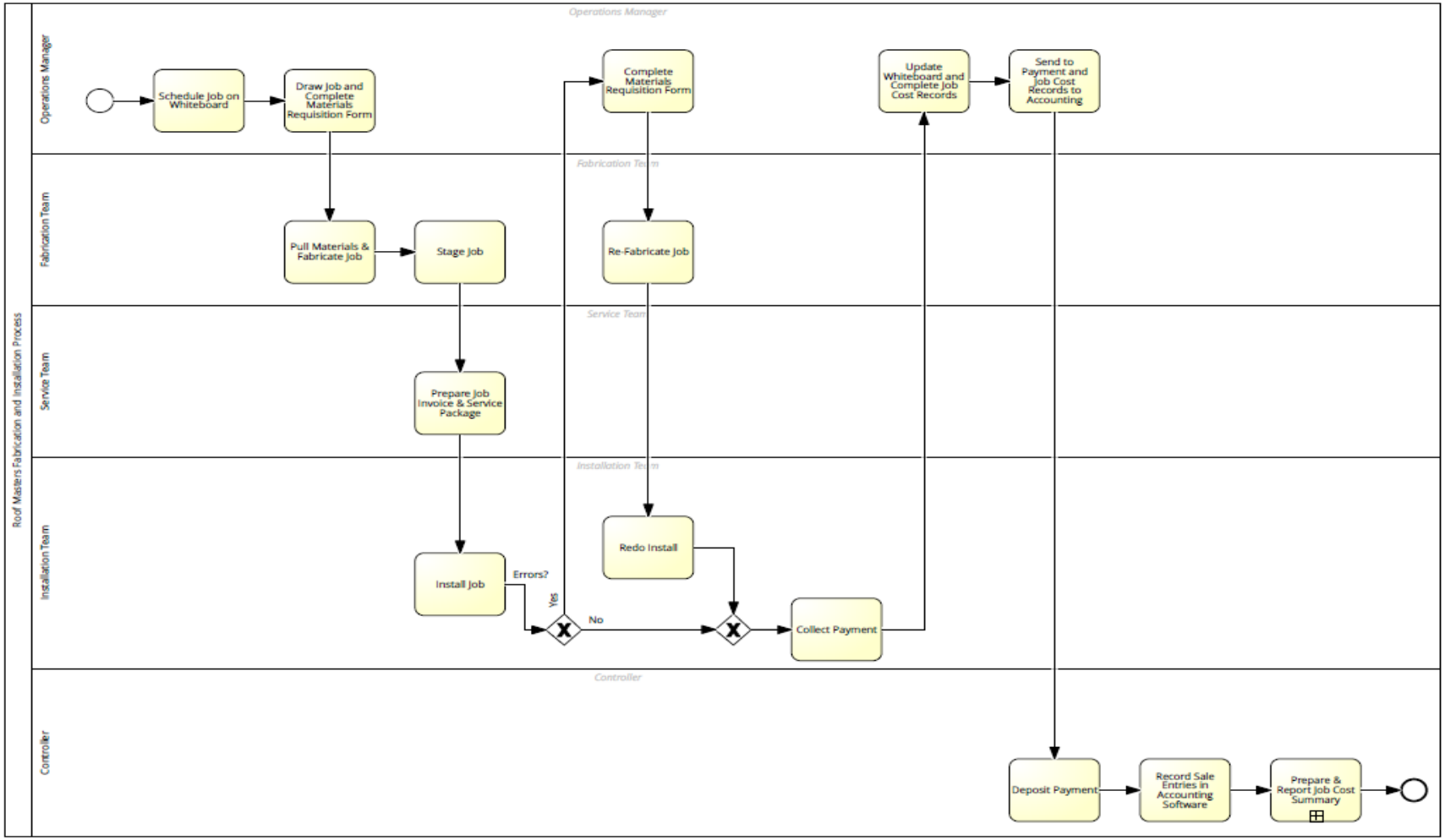


FIGURE 6
JOB COST FORMS COMPILED IN ACCOUNTING DEPARTMENT

Job Cost Record

Job #	Install Date
Customer Name	Supervisor Approval
Fabricator(s)	
Fabrication Drawing	

Materials Requisition

Date	Item No.	Qty.	Inventory Item Description

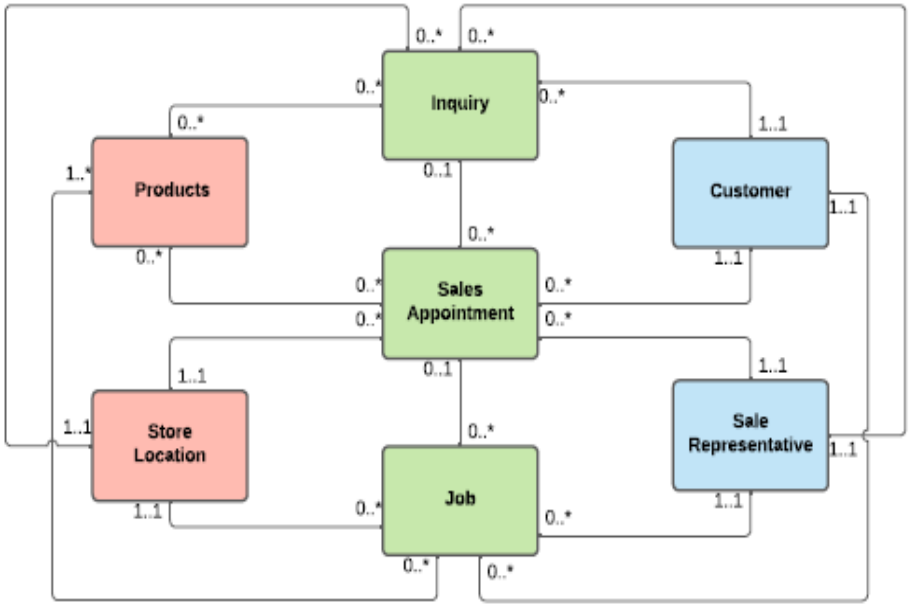
Labor Record

Date	Employee Name	Task Description	Hrs Qty.

Job Cost Summary Report

Job #				Install Date	
Customer Name				Costs on Target: Y / N	
Product Type				Sq. Ft.	
Budgeted Costs					
Budgeted Fabrication Labor		Budgeted Install Labor		Budgeted Materials Cost	
Materials Requisition					
Date	Item No.	Description	Qty.	Cost	Total Cost
Labor Record					
Date	EE No.	Name	Qty.	Cost	Total Cost
Variance Fabrication Labor		Variance Install Labor		Variance Materials Cost	
Sales Details					
Actual Sales Price/sq. ft.		Budgeted Sales Price/sq. ft.		Sales Variance	
Managerial Notes					

FIGURE 7
CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM (CRMS) UML



Products: Product ID (PK), Product Description

Store Location: Store ID (PK), Street Address, City, Zip Code, Phone

Inquiry: Inquiry # (PK), Inquiry Date, Inquiry Notes, Customer (FK), Sales Rep ID (FK), Store ID (FK), Status (FK)

Sales Appointment: Appt # (PK), Appt Date, Appt Notes, Customer (FK), Sales Rep ID (FK), Store ID (FK), Status (FK)

Job: Job # (PK), Sales Date, Sales Notes, Customer (FK), Sales Rep ID (FK), Store ID (FK), Status (FK)

Customer: Customer ID (PK), Name, Street Address, City, Zip Code, Phone

Sales Representative: Sales Rep ID (PK), Name

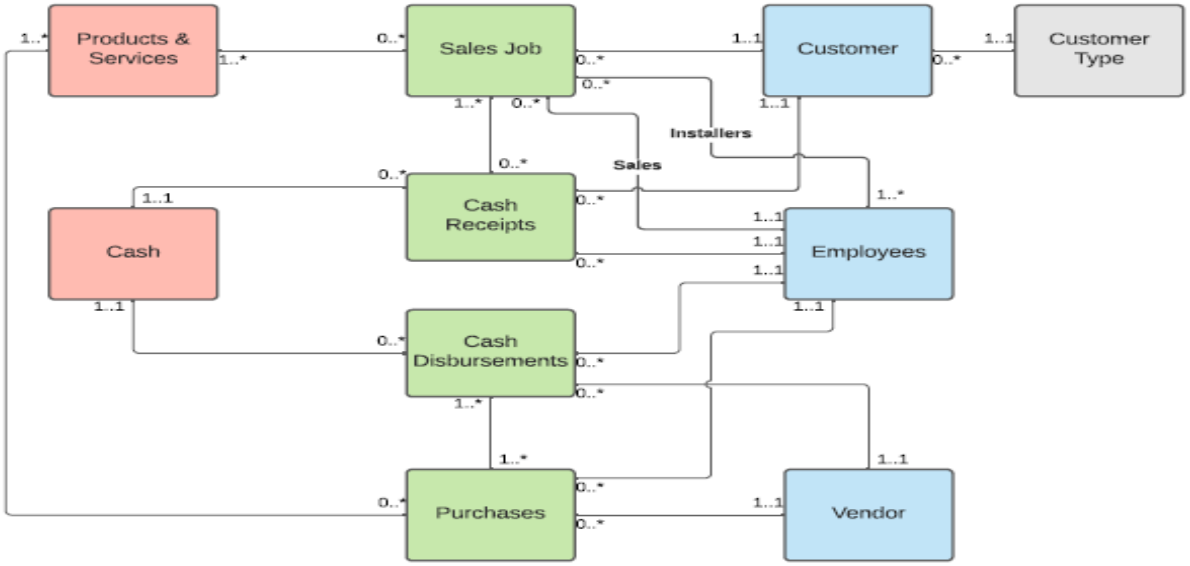
Status: Status Type (PK)

Inquiry-Products: Inquiry # + Product ID (PK), Qty., Amount

Sales-Products: Appt # + Product ID (PK), Qty., Amount

Job-Products: Job # + Product ID (PK), Qty., Amount

FIGURE 8
ACCOUNTING INFORMATION SYSTEM (AIS) UML



Products & Services: Item # (PK), Item Desc., QOH, Reorder Point

Cash: Bank Acct # (PK), Bank Name, Bank Address

Sales Job: Invoice # (PK), Date

Cash Receipts: Cash Receipt # (PK), Date, Amt.

Cash Disbursements: Check # (PK), Date, Amt.

Purchases: PO # (PK), Date

Customer: Customer # (PK), Name, Address, Phone

Employees: Employee # (PK), Name, Address, Pay Rate, Pay Type

Vendor: Vendor # (PK), Name, Address, Phone

Customer Type: Type ID (PK)

Purchases-Product & Services: Item # + PO # (PK), Qty. , Amt.

Sales Job-Products & Services: Invoice # + Item # (PK), Qty., Amt.

Sales Job-Cash Receipts: Invoice # + Cash Receipt # (PK)

Purchases- Cash Disbursement: PO # + Check # (PK)

PART 2

INTRODUCTION TO THE CASE

Accounting professionals are experiencing a paradigm shift unlike any other. Earning the title of trusted business advisor, auditor, and CFO now requires technology skills in artificial intelligence, blockchain, digital currency, and more. Recent graduates, young professionals, and seasoned managers are all challenged to adopt a lifelong learning mindset toward delivering cutting-edge services to clients. As the profession aims to recruit and deploy a diverse and tech-savvy workforce, recent federal bills have been introduced to enhance K-12 education in accounting by adding the STEM designation (The Latest on the STEM Initiative, n.d.). This case uniquely demonstrates the STEM connection to the accounting industry, providing for an application of critical thinking skills surrounding the use of technology to improve business decision-making.

CASE LEARNING OBJECTIVES

1. Identify prospective challenges in internal accounting positions with SMEs (Accounting staff, management, controller, CFO, etc.).
2. Develop critical thinking skills toward developing business solutions.
3. Identify the interpersonal skills needed to navigate cross-functional teams.
4. Develop ethical decision-making skills and the development of fraud detecting systems using technology.
5. Understand the impact that data has on internal decision-making toward strengthening database and business intelligence systems.

IMPLEMENTATION GUIDANCE

Case Context and Purpose

This case connects undergraduate accounting students to a potential pathway in internal accounting, including accounting manager, controller, and CFO roles, which requires technology skills and knowledge of various accounting and data systems. Students interested in tax and audit pathways are also made aware of potential challenges for their SME (small-midsized enterprise) clients in technology, business intelligence, internal controls, and compliance. As students inevitably face a growing need for skills in advanced analytics tools, robotic process automation, and business intelligence, this case provides insight into just how critical the right technology and related decision-making skills are to the health of an organization.

The implementation guidelines for this case will emphasize how students will learn the importance of having traditional accounting skills and understanding how to leverage emerging technologies to prevent fraud and lower costs through efficiencies. The application of databases, internal controls, process improvement, and related technologies are typically introduced in one or more accounting information systems (AIS) courses in a typical undergraduate accounting program (Neely, Forsgren, Premuroso, Vician, and White, 2015).

The authors, therefore, support the STEM designation for accounting as AIS courses situate the importance of technology alongside the science of business decision-making through the advancement of critical thinking skills development. The AICPA, among other reasons, also argues in favor of the STEM designation to draw a diverse and innovative pipeline of professionals to continue serving the public interest with emerging technologies (Seven Reasons Why Accounting Should Join Other Tech Professions as a STEM Field, 2023). The profession is also evolving to meet clients' technological needs by making relevant changes to the CPA exam (Evolving initial CPA licensure requirements to build a future-ready profession for a rapidly changing marketplace, n.d.). Faculty are encouraged to broaden their skills in technology and analytics at various conferences and departmental strategy meetings to meet the profession's needs (Academic Resource Hub, n.d.). Traditional accounting textbooks are responsively transforming with the inclusion of practical analytics applications in the classroom. Students are also encouraged to build such skills outside of their classroom as they enter the job market (A Career Built for the Future, n.d.). The use and understanding of technology broaden the impact these future accountants can make within an organization and open opportunities for related roles in advisory or as business technologists.

The suggested case questions evoke critical thinking around the purpose and use of technology within a business for fraud detection, decision-making, and efficiency. The case demonstrates the potential demise of an organization that fails to adopt appropriate technology and deploy best practices in internal controls surrounding general accounting and technological practices. Even if students recognize the need for advisors in certain areas, there is still growth in understanding when and where to seek support within and outside of our field. Since this case is used in an AIS course, additional appendix items such as UML (Unified Modeling Language) and BPMN (Business Process Modeling Notation) further demonstrate the juxtaposition of accounting and STEM using technical diagramming skills to understand the storage, use, and processing of accounting data.

Case Implementation Details

Timing and Nature of Assignment

The case was deployed across both online and in-person teaching modalities during recent years due to the pandemic. It was administered in each occurrence in the last two weeks of the semester as a final review of all critical topics covered in the course to enhance critical thinking and the use of related technologies in practice. The students remained working in teams of five formed in earlier weeks for previous group work.

Individual Preparation and Deliverable

In both the online and in-person delivery of the case, students are encouraged to read the case before class and come prepared to engage in an introductory discussion. Before joining in a team/class discussion, individual students were given ten to fifteen minutes to review the case in class and answer the first question on how this case connects to the overall class in class discussion. Students must first post to the platform before they can see the work of others for comparison. This step helps ensure all members have read the case and understand the upcoming assignment's basic nature.

Initial Group and Class Discussion

Either on Zoom or in class, students join their group to note at least three key highlights from their initial read to share with the overall class. The instructor then notes key themes and timelines on the board for additional discussion and clarification.

Further Group Decisions

Once the case highlights are discussed as a class, the team regrouped to divide each critical thinking question two through six. Then each individual student spent another fifteen minutes quickly researching potential answers to their assigned question to share with the group and class. After another fifteen minutes of group discussion, each team shares a part of their answers with the class and the instructor may choose to write these on the board to deepen the discussion. All questions are written in such a way that they are unique to the fictional company and that each individual must defend their reasons for their answers to avoid potential cheating or use of artificial intelligence tools.

Critical-Thinking Question Deliverable

Each group member is then tasked to answer their assigned question on a class discussion board by the end of the week. The instructor can also require students to submit a dropbox assignment where a plagiarism tool is more effective in addressing potential cheating issues. Other team members may optionally reply to their team members' posts if they feel the response is insufficient before the deadline to help increase their team's grade, allowing for greater individual accountability over the overall grade. These discussions are graded with substantive feedback to help students dive deeper into the overall course concepts before the cumulative final. Rubric-based feedback is then shared with the individuals for study. It is important to review student submissions for originality, for instance, no two answers should be the same because students are ranking business problems/solutions with unique explanations. Answers may be similar but not exact.

Final Deliverable

In the second week of this case, students complete a final wrap up of the case with a deep dive into accounting career pathways. Most students are aware of traditional tax and audit roles and the CPA. This final exercise helps students build a personalized life-long learning toolkit toward awareness of additional advisory, controller, and CFO roles available in accounting. This portion of the case also emphasizes the need for additional certification and the various options. Students first discuss in class their overall career goals with the team, and class to then parallel their goals to the protagonist in the case (the controller). Students then submit a list of five high-quality continuing professional education websites to emphasize the importance of lifelong learning. Students also make a recommendation for certification for the controller

in the case and compare the journey of internal accounting to their own plans. Other students are encouraged to reply to their peers to enhance learning.

Case Student Feedback and Learning

Many students in undergraduate accounting programs do not have prior internal accounting experience and therefore, this case serves as a preview of the various challenges related to proper deployment of technology for internal controls and efficiency. Students are expected to have synthesized their introductory knowledge of business intelligence, analytics, COSO and COBIT internal controls and data security frameworks, and data management with a practical application of advisory skills in SMEs.

The results of an end-of-the-assignment survey suggest that most undergraduate accounting learners found this case exercise valuable. The following table further shows a dissection of questions related to both technology and lifelong learning. The overall responses on the readiness to evaluate technology-related needs for an organization ranged from 65.26% - 95.88% over the four semesters. Students are least comfortable with the topic of COBIT and most comfortable assessing ERP and Business Intelligence needs. Most traditional roles of accounting focus on the COSO principles for internal controls rather than COBIT. Therefore, these results support that accounting students, while still needing to adapt and become technologically agile, will likely continue to require collaboration skills to work with IT professionals for data and AIS security and management.

The overall responses on the readiness for career skills related to lifelong learning ranged from 71.79% - 93.55%. The results suggest that students understand the importance of agility in their careers. This mindset will help these young professionals prepare for the future challenges as we experience this paradigm shift in skillsets required for success. As employers demand increasing knowledge of emerging technologies and an analytics mindset, this case may be used to encourage students to assess their own skills and readiness for a career built for the future. The majority of students who responded to this survey acknowledged and value readiness. Using the lifelong learning toolkit from this case will have a clearer understanding of existing professional resources to move forward into certification or other continuing professional education.

TABLE 1
STUDENT SURVEY FEEDBACK

Semester	Modality	Technology			Lifelong Learning		
		Q 4	Q5	Q6	Q8	Q9	Q10
Sp 2021	Online	65.26 %	81.25%	77.90%	72.63%	76.84%	71.79%
Fall 2021	Online	75.43%	89.83%	89.84%	87.29%	86.44%	91.53%
Sp 2022	In-Person	78.35%	95.88%	89.69%	89.69%	88.66%	92.78%
Fall 2022	In-Person	82.26%	88.71%	90.32%	93.55%	83.87%	88.71%

The numbers in the table indicate the percentage of the students who answered the question as valuable and most valuable. Please refer to Annexure for more details regarding the survey.

Case Resources

The following table presents related web-based resources that students and instructors may use for research. Students may also consider using the textbook and lecture notes to clearly demonstrate related course learning.

TABLE 2
WEB-BASED RESOURCES

COSO Internal Controls	https://www.coso.org/
COBIT Data Security	https://www.isaca.org/resources/cobit
UML	https://www.omg.org/spec/UML/
BPMN	https://www.omg.org/bpmn/index.htm
AICPA	https://www.aicpa-cima.com/cpe-learning/certificate-program
IMA	https://www.imanet.org/
CPA	https://www.thiswaytocpa.com/
CISA	https://www.isaca.org/credentialing/certifications
IIA	https://www.theiia.org/en/certifications/cia/

APPENDIX

TABLE 3
CASE SURVEY RESULTS

	Spring 2021 Semester (Online Only N=95)	Not Valuable		Minimally Valuable		Somewhat Valuable		Valuable		Extremely Valuable		Total
1	Did the case interest you, from the perspective of this course and your undergraduate studies?	1.05%	1	3.16%	3	22.11%	21	46.32%	44	27.37%	26	95
2	Did you find the text of the case helpful in understanding course-related challenges for SMEs?	1.05%	1	4.21%	4	14.74%	14	51.58%	49	28.42%	27	95
3	Did the facts of the case and class discussions help you evaluate COSO internal controls and risk management needs for SMEs?	0.00%	0	2.11%	2	22.11%	21	35.79%	34	40.00%	38	95
4	Did the facts of the case and class discussions help you evaluate COBIT needs for SMEs?	0.00%	0	5.26%	5	29.47%	28	40.00%	38	25.26%	24	95
5	Did the facts of the case and class discussions help you evaluate data management and ERP needs for SMEs?	0.00%	0	2.11%	2	16.84%	16	41.05%	39	40.00%	38	95
6	Did the facts of the case and class discussions help you evaluate business intelligence and emerging technology needs for SMEs?	0.00%	0	4.21%	4	17.89%	17	43.16%	41	34.74%	33	95
7	Did the facts of the case and class discussions help you evaluate BPMN and process improvement needs for SMEs?	0.00%	0	6.32%	6	20.00%	19	47.37%	45	26.32%	25	95
8	Did this case project facilitate learning research skills?	1.05%	1	9.47%	9	16.84%	16	40.00%	38	32.63%	31	95
9	Did this case project facilitate learning various accounting career pathways?	1.05%	1	6.32%	6	15.79%	15	35.79%	34	41.05%	39	95
10	Did this case project develop a life-long learner mindset in you encouraging you to continue learning after graduation?	0.00%	0	2.11%	2	22.11%	21	27.37%	26	48.42%	46	95

	Fall 2021 Semester (Online Only N=118)	Not Valuable		Minimally Valuable		Somewhat Valuable		Valuable		Extremely Valuable		Total
1	Did the case interest you, from the perspective of this course and your undergraduate studies?	0.00%	0	1.69%	2	10.17%	12	49.15%	58	38.98%	46	118
2	Did you find the text of the case helpful in understanding course-related challenges for SMEs?	0.00%	0	0.00%	0	12.71%	15	50.00%	59	37.29%	44	118
3	Did the facts of the case and class discussions help you evaluate COSO internal controls and risk management needs for SMEs?	0.00%	0	0.85%	1	10.17%	12	43.22%	51	45.76%	54	118
4	Did the facts of the case and class discussions help you evaluate COBIT needs for SMEs?	0.00%	0	2.54%	3	22.03%	26	40.68%	48	34.75%	41	118
5	Did the facts of the case and class discussions help you evaluate data management and ERP needs for SMEs?	0.00%	0	0.85%	1	9.32%	11	42.37%	50	47.46%	56	118
6	Did the facts of the case and class discussions help you evaluate business intelligence and emerging technology needs for SMEs?	0.00%	0	0.00%	0	10.17%	12	41.53%	49	48.31%	57	118
7	Did the facts of the case and class discussions help you evaluate BPMN and process improvement needs for SMEs?	0.85%	1	2.54%	3	15.25%	18	44.07%	52	37.29%	44	118
8	Did this case project facilitate learning research skills?	0.00%	0	2.54%	3	10.17%	12	36.44%	43	50.85%	60	118
9	Did this case project facilitate learning various accounting career pathways?	0.00%	0	1.69%	2	11.86%	14	28.81%	34	57.63%	68	118
10	Did this case project develop a life-long learner mindset in you encouraging you to continue learning after graduation?	0.00%	0	0.85%	1	7.63%	9	37.29%	44	54.24%	64	118

Spring 2022 Semester (In-Person N=97)		Not Valuable		Minimally Valuable		Somewhat Valuable		Valuable		Extremely Valuable		Total
1	Did the case interest you, from the perspective of this course and your undergraduate studies?	0.00%	0	3.09%	3	5.15%	5	50.52%	49	41.24%	40	97
2	Did you find the text of the case helpful in understanding course-related challenges for SMEs?	0.00%	0	2.06%	2	9.28%	9	40.21%	39	48.45%	47	97
3	Did the facts of the case and class discussions help you evaluate COSO internal controls and risk management needs for SMEs?	0.00%	0	0.00%	0	9.28%	9	48.45%	47	42.27%	41	97
4	Did the facts of the case and class discussions help you evaluate COBIT needs for SMEs?	0.00%	0	3.09%	3	18.56%	18	41.24%	40	37.11%	36	97
5	Did the facts of the case and class discussions help you evaluate data management and ERP needs for SMEs?	0.00%	0	0.00%	0	4.12%	4	53.61%	52	42.27%	41	97
6	Did the facts of the case and class discussions help you evaluate business intelligence and emerging technology needs for SMEs?	0.00%	0	1.03%	1	9.28%	9	48.45%	47	41.24%	40	97
7	Did the facts of the case and class discussions help you evaluate BPMN and process improvement needs for SMEs?	0.00%	0	4.12%	4	8.25%	8	48.45%	47	39.18%	38	97
8	Did this case project facilitate learning research skills?	0.00%	0	1.03%	1	9.28%	9	45.36%	44	44.33%	43	97
9	Did this case project facilitate learning various accounting career pathways?	0.00%	0	0.00%	0	11.34%	11	27.84%	27	60.82%	59	97
10	Did this case project develop a life-long learner mindset in you encouraging you to continue learning after graduation?	0.00%	0	0.00%	0	7.22%	7	34.02%	33	58.76%	57	97

	Fall 2022 Semester (In-Person N=62)	Not Valuable		Minimally Valuable		Somewhat Valuable		Valuable		Extremely Valuable		Total
1	Did the case interest you, from the perspective of this course and your undergraduate studies?	1.61%	1	0.00%	0	8.06%	5	46.77%	29	43.55%	27	62
2	Did you find the text of the case helpful in understanding course-related challenges for SMEs?	0.00%	0	0.00%	0	11.29%	7	38.71%	24	50.00%	31	62
3	Did the facts of the case and class discussions help you evaluate COSO internal controls and risk management needs for SMEs?	0.00%	0	0.00%	0	11.29%	7	38.71%	24	50.00%	31	62
4	Did the facts of the case and class discussions help you evaluate COBIT needs for SMEs?	0.00%	0	0.00%	0	17.74%	11	37.10%	23	45.16%	28	62
5	Did the facts of the case and class discussions help you evaluate data management and ERP needs for SMEs?	0.00%	0	1.61%	1	9.68%	6	35.48%	22	53.23%	33	62
6	Did the facts of the case and class discussions help you evaluate business intelligence and emerging technology needs for SMEs?	0.00%	0	0.00%	0	9.68%	6	43.55%	27	46.77%	29	62
7	Did the facts of the case and class discussions help you evaluate BPMN and process improvement needs for SMEs?	0.00%	0	0.00%	0	16.13%	10	40.32%	25	43.55%	27	62
8	Did this case project facilitate learning research skills?	0.00%	0	0.00%	0	6.45%	4	40.32%	25	53.23%	33	62
9	Did this case project facilitate learning various accounting career pathways?	0.00%	0	3.23%	2	12.90%	8	29.03%	18	54.84%	34	62
10	Did this case project develop a life-long learner mindset in you encouraging you to continue learning after graduation?	0.00%	0	0.00%	0	11.29%	7	32.26%	20	56.45%	35	62

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PART 3

Teaching Notes: Potential Case Solutions to Critical Thinking Questions

1. *Make the Connection*

   How do the course and weekly learning objectives posted in the syllabus and module overviews of this AIS course relate to this case? (Hint: course learning objectives are summarized on the first page of the syllabus for you).

   Answers will vary. Sample Student Response:

   The case displays the important need to add relational databases and accounting software to efficiently record, store and analyze business transactions and financial data. For example, Roof Masters first used physical records such as invoices, material records, and timecards. Implementing systems, we learned such as an ERP system will reduce the inefficiency of manual processes and centralize all financial data. To better understand how the company works, Roof Masters could have utilized UML and REA. In the case of Roof Masters, there is a clear lack of internal controls. As we learned, the COSO Framework will provide a company with structure to reduce and eliminate risks. In Roof Masters, the owners had to regularly mediate clashes between management and consultants, where if COSO framework were applied, these issues would have controls to reduce or eliminate the need for owner intervention. Another issue is that there was a lack of separation of duties and too many outside players causing the owners to miss important issues with their consultants and executives.

2. *Internal Controls*

   Based on your understanding of the COSO internal control and risk frameworks, what are the top five risks for Roof Masters and why?

   Answers will vary. Sample Student Response:

   The top five COSO internal control framework risks present in the case of Roof Master are (1) independence issues, (2) no risk assessment, (3) lack of separation of duties, (4) lack of communication, and (5) missing commitment to integrity and ethical values.

Owners first hired their wives to help with the back office. The personal relationship jeopardized the independence rule of the AICPA Professional Code of Ethics Independence rule. They further hampered internal controls when hiring close friends.

The romantic and friendship relationships could and did cause the owners of Roof Master to overlook fraud. Roof Master was successful and showed profits, and because its management were inexperienced accountants, no risk assessment took place.

A lack of separation of duties happened when the bookkeeper was responsible for recording sales entries, managing cash receipts, and preparing deposits. This person was able to have access to all points of the sales revenue process. The person that enters sales should also not handle the cash. The person that controls the incoming cash receipts should also not prepare the deposits. Additionally, the bookkeeper reconciled the business credit card. No other person checked the bookkeeper's work until the discovery of the fraud. The violation of the separation of duties is a violation of the Control Activities principle 10 component of internal controls.

There is no clear evidence of clear communication between the corporate governance, management, back-office worker, and front-office worker. The lack of communication continued and allowed fraud to exist.

Finally, Roof Master was missing a commitment to integrity and ethical values. The owners may have expressed integrity and ethics, but the people hired did not. They did not perform proper background checks to ensure these new hires would act with good intentions. The fraud triangle was present in this case. Opportunity, pressure, and rationalization allowed these thieves to take substantial money from the company.

3. *COBIT*

Based on your understanding of the COBIT framework, what are the top five information system and security concerns for Roof Masters and why?

Answers will vary. Sample Student Response:

The COBIT framework has 5 important domains which are the following:

1. *EDM (Evaluate, Direct, Monitor) Governance of IT*
2. *APO (Align, Plan, Organize) IT management.*
3. *BAI (Build, Acquire, Implement) IT management.*
4. *DSS (Deliver, Service and Support) IT management.*
5. *MEA (Monitor, Evaluate, Access) Governance IT management.*

The whole purpose of the COBIT framework is to support IT governance and management by providing the appropriate framework to ensure that IT is aligned with the business. The security concerns for the Roof Master are the following:

1. *No cyber security set in place; The company was exposed to a potential risk of getting hacked and having all their information stolen, resulting in the loss of millions of dollars*

2. *No passwords; The company also didn't have any passwords set in place for their employees or their computers which exposed them internally; This could lead to clients or employees stealing sensitive information.*
3. *No proper storage of information; The company dealt with a lot of important financial information that was documented on physical documents. These documents weren't stored in a secure place, also the data that was stored in their computers wasn't password protected.*
4. *Anyone had access to their internal assets; Because of the lack of a security system set in place by the company, anyone that was in the office had access to the assets, not only their materials but also their cash, bank account information etc.*
5. *No background checks; The company didn't conduct a proper background check on certain employees and because of this the company was exposed to fraud.*

The company often failed to follow any practices to secure their company whether it was internally or externally, by not following any of the COBIT and IT framework, it let the company exposed to fraud, cyber-attacks and more. As we see in the case the company did in fact experience fraud by their employees and the company could continue experiencing fraud if the proper controls are not set in place.

4. *Data Management*

Based on your understanding of Data Management, what are the top five reasons for Roof Masters to implement an ERP and why?

Answers will vary. Sample Student Response:

Data management is an important facet of every company. While every company processes relevant information differently, properly utilizing resources to analyze data efficiently can have long-term benefits. One main resource that we believe will help Roof Masters with their data management is an ERP system. Through implementation of an ERP system, Roof Masters can create additional value for their company through improved productivity, reliable and timely data, security regulations, centralized solutions, and structure in the corporation. Roof Master is a business that started from one of the owner's garages and grew into a sizable firm. While their expertise and brand recognition allowed them to grow quickly, the owners unfortunately allowed their inexperience to lead to an overall lack of structure in the way the firm dealt with problems. By relying on outside third parties to manage their departments and not forming their own values and mission statements, they quickly lost control. An ERP system, if implemented during their early stages, would be able to add structure in their methods and policies. In addition to providing standardized data, ERP systems also standardize the way work flows, eradicating differences between departments and ensuring that everyone involved is following the same practices. One of the main issues plaguing Roof Masters is a lack of a centralized system. Currently they obtain data from various sources, including handwritten records and scheduling details from a whiteboard. Although gaining information from various sources is a good way to corroborate that the information you are obtaining is reliable, the validity of these sources is hard to verify. Companies with multiple departments can also find it time-consuming to bridge the gaps between accounting, sales, and operational data. An ERP system would provide Roof Masters with a way for everyone to have

access to the same data, mitigating risks associated with the validity of data obtained. Many ERP systems also have time log capabilities which would identify who has modified or inputted data, providing a necessary level of authentication within the company and allowing them to easily pinpoint areas of weakness within their infrastructure. The digitalized nature of the data also allows for updates to occur almost instantaneously, providing the firm's employees with up-to-date data ranging from the specifications of new fabrication contracts to detailed job costs records. Employees who are having a hard time dealing with increasing demand in a growing company will also be able to work more efficiently and have more time to deal with tasks that require specialized attention versus the manual labor associated with data entry. A recurring issue in Roof Master's history was the lack of internal controls in their processes. Whether it be a bookkeeper illegally modifying a check to installers working under the table for additional profits, the system allowed for fraud to continue and only be identified until it was too late. Through implementing an ERP system, Roof Master would be able to install firm-wide controls over various departments, reducing the areas of oversight from management and inhibiting employees from breaking company policy through fabricating records.

5. *Business Intelligence and Emerging Technologies*

Based on your understanding of business intelligence and emerging technologies, how might the deployment of these technologies improve decision-making and overall operational efficiencies for Roof Masters?

Answers will vary. Sample Student Response:

Roof Masters is a study of what happens when a company has all the necessary parts to be a success but fails to meet its potential. In addition to all the organizational and operational issues, Roof Masters also failed to conduct even the most basic analysis of the economy, the industry, even their own business.
Throughout my years of experience, I have found that being intimidated by data is a common trait, but the reality is that it can be overwhelming for some people to understand what the data means. Business intelligence as translating the language of data into plain English and pictures.

Business intelligence takes the voluminous quantity of data generated by the company and translates it into a narrative that helps management and interested individuals understand the financial and non-financial performance of a firm. Business intelligence provides a complete picture beyond the scope of the business. When economic indicators and trends are incorporated into the analysis generated by the company, business planning can be shaped by not only company data, but also potential opportunities and threats to the business from external forces.
Roof Masters' business model was dependent on the housing market and the overall health of the economy being strong enough to entice potential customers to pay the premium for Roof Masters' service.

Additionally, incorporating emerging technology such as artificial intelligence, prescriptive and preventative analytics, Roof Masters may have been able to improve efficiency and profitability. Prescriptive and preventative analytics may have been able to identify trends in consumption of resources to identify the fraud perpetuated by the Operations Manager or to identify fraud risks not easily seen

within the company data. Artificial intelligence may also have been instrumental in marketing choices and targeting specific areas that may have improved decision-making in not only advertising, but also with expansion plans into additional counties.

These tools may add to the cost of doing business, but they have the potential to generate returns garnered through improved operational efficiency that can recoup the cost many times over. Bringing in a business analyst, even on a part time basis, is also something that, in the case of a "do-over," is something Roof Masters should consider. Having a set of eyes, a direct employee of the company, could have helped the owners make more informed decisions that were company centric, not outside consultant centric with companies that have an outside financial interest with little financial stake.

6. *Business Processes*

Based on your understanding of BPMN and business process, what are the top five process improvement recommendations for Roof Masters and why?

Answers will vary. Sample Student Response:

1. *Fabrication and Installation Process: Add a datastore artifact and connect it to the first event. Instead of scheduling the job on a whiteboard (as per the first event under "operations manager") jobs should be documented and stored under a database so that it has a more permanent location. Doing so keeps record of jobs done in a synchronized place and can be accessed by multiple people.*
2. *Fabrication and Installation Process: Have the payment be directed to a different department/team under a different swimlane, such as accounting (as per the third event under "installation team"). Collusion became an issue since payment was being directly sent to the operations manager from the installation team, so by having a third department involved as an intermediary, it adds an extra layer within the process thus reducing the chances of the operations manager scheming with the installation crew since the reporting relationship is no longer direct.*
3. *Fabrication and Installation Process: Add a time artifact attached to job installation (as per the first event under "installation team"). Adding a time artifact for the job will indicate the specific time and date an installation is done. As described in the case study, the operations manager colluded with the installation team to perform "side jobs" on company time, having the timer helps track how long certain jobs take and can help with catching suspicious activity if there are discrepancies with timing.*
4. *Purchase Processes: Add a "message"/envelope artifact as a request. Have an event where the operations manager sends a request to the controller to approve the supply order list. Once the controller approves, then the supplies can be ordered. Having just the operations manager being fully in charge of all of the supplies ordering process means they have the chance to order an excess amount of material and stealing the materials or using them to perform side jobs. Adding the event reduces the chance of the operations manager from ordering an excessive amount of*

supplies since the controller reviews and signs off the supply order list and can detect if the quantities are too excessive based on the contracts.

5. *Purchase Processes: Create a new swim lane for "accounting manager". Instead of the controller receiving and paying the supplier invoice, this should be done by an accounting manager, which is then sent off to be confirmed and signed off by the controller. This adds the element of separation of duties, so that there is someone else to confirm when you are paying or receiving.*

7. Build a Lifelong Learner Toolkit

e) Reflect on the key aspects of the case and your personal learning journey in this course.
f) Based on the professional organizations introduced in class (AICPA, CalCPA, IMA, IIA, ISACA, AAA, COSO) consider what resources are available.
g) Compile a list of five quality websites that offer CPE for accountants and foster lifelong learning.
h) What certifications would you recommend for the Roof Masters controller and why?

Answers will vary. Sample Student Response:

I would recommend the Roof Masters Controller invest time and money in acquiring a CIA certification. Even if not moving through the public accounting world, being able to perform trained in-depth risk assessments and establish effective internal controls would be an invaluable skill in an accounting professional in industry. Additionally, having that type of certification will open additional pathways throughout the Controller's career. I am looking at earning my CPA certification, I am also considering a CISA certification to capitalize on my classes I have already completed in IS and to improve my future job options. I do not believe that I would head into Controller route, or at least, not at this time – I am open to what the future brings. I am the best in the support world and absolutely love puzzles. I am also considering earning my CFE (certified fraud examiner), which is the direction I plan on heading in case I find the assurance world not for me after a few years. CPE Resources - During my internship at RSM, there were opportunities for CPE credits in courses offered for employees through synchronous, asynchronous, or live courses covering a wide range of accounting topics. I attended some of those courses and was eligible for CPE credit if I participated in the course throughout the session. They offered courses in a playlist form for the introduction to the various service lines, also links to related LinkedIn learning courses, and live courses learning innovative technology being introduced to staff. As an example, the tech group created a way to process choices for samples and audit. RSM utilized Alteryx to process available options for sampling from invoices to revenue, to assets. While this is a great option, it is only available to employees of RSM through the intranet employee site. More information about RSM can be found at www.rsmus.com
Advocate of quality CPE - NASBA Registry.
https://www.linkedin.com/learning/
CPE Professional Development and Continuing Professional Education | CPE for CPAs - AICPA
CPE Requirements (calcpa.org)

Teaching Notes: Conclusions

Dealing With Potential Plagiarism and the Use of AI Tools in Responses

This case and others can potentially be solved using AI Tools like Chat GPT. A clear policy should be included in the instructor's syllabus. Some plagiarism tools may exist at your institution to detect AI use in submission write ups. Students should be required to provide references and results should be aligned well with semester learning. One easy way to detect AI usage is when responses are overly elaborate or diverge from course learning materials at a higher or even lower level. Ideally, the case deliverables should alternate between "live" in-class discussions, written responses, and oral communication in-class or recorded to combat any unwanted use of AI. Some instructors may feel comfortable encouraging AI usage as a part of the early research in the case, again requiring that the work be cited.

Suggestions for Modification

The critical thinking case questions are written in such a way that there should never be an exact same answer and there are no "right answers" to copy. Learners must demonstrate a higher level of learning and synthesis by first prioritizing their response components and then defending why they have done so. Questions can and should be modified if the case is used outside of a typical AIS undergraduate or graduate level course or if the learning objectives do not clearly align with the instructor preference. Some potential modifications might be:

1. Modify the data and add a data analytics component to demonstrate use of an appropriate tool (Excel, Tableau, PowerBI, etc.).
2. Require students to present and defend case summary in class.
3. Use the optional podcast assignment as a method to better gauge individual level understanding of concepts as a form of oral assessment.