IT Auditing:
A Possible Career for MIS Majors

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ABSTRACT

There is a growing phenomenon in the United States in the IT audit profession to hire MIS majors, even those who have little or no formal education in auditing. Moreover, the demand for entry-level IT auditors is rising, mostly due to dramatic changes in laws and regulations. Regardless of whether an MIS student is currently interested in this career, all MIS students (and educators) need an awareness of the impact that these new laws and regulations are having on IT operations. For students interested in IT audit careers, we describe IT auditing and discuss skills necessary for success in this profession.

INTRODUCTION

While some United States business schools have combined management information systems (MIS) and accounting departments, in most instances these departments are separate and thus are not likely to communicate very well. As a result, many information technology (IT) and MIS educators may not be aware of the recent rapid increase in career opportunities in the IT audit profession for new college graduates with an information technology-related degree, such as MIS (or perhaps computer science). Indeed there is a dearth of IT audit classes (not to mention curriculums) in business schools across country. Moreover, one of the key reasons for this increased demand for information system (IS) auditing skills - the recent dramatic changes in the regulatory environment for U.S. public companies - may also compel some current IT professionals to understand how these regulations might affect their job responsibilities and to respond accordingly.

The primary purpose of this paper is to alert MIS/IT educators in business schools to the recent and ongoing growth of the IT audit profession and, perhaps more importantly, to the demand for MIS students as candidates for entry-level IT audit positions even though these students might not have any formal auditing education. In addition, we will briefly address the need for some IT personnel to expand their job scope to become cognizant of the requirement to document and assess IT risks and controls in order to help management comply with new financial disclosure regulations. The first author of this paper was a Certified Public Accountant (CPA) in a prior career and is currently a faculty member in an MIS department, and also serves as the Academic Advocate (i.e., faculty advisor) for Miami University's student Information Systems Audit and Control Association (ISACA) chapter. This student chapter was recently founded because of the work and encouragement of members from the local professional ISACA chapter (who ultimately want to leverage their opportunities to hire Miami graduates). This paper's second author is a recent graduate from Miami's MIS program and an entry-level IT auditor with a large bank. Thus the research for this paper benefits from insights gleaned from real-world education and career experiences in addition to informal discussions with members of the IT audit professional community.

The next section of this paper describes IT auditing and discusses the key reasons for the increased demand for IT audit professionals. Thereafter we discuss skills necessary for success in this profession. We conclude with a discussion of ways that MIS educators can help students prepare for possible IT audit careers.

INCREASING DEMAND FOR IT AUDITING

In order to better conceptualize IT/IS auditing, one should have working understanding of IT governance, which is the process of effectively controlling an organization's IT resources in order to establish strategic information technology competencies and to comply with regulatory and contractual obligations (Hunton, Bryant & Bagranoff, 2004; Luftman, Bullen, Liao, Nash, & Neuman, 2004). IT auditing consists of assessing IT risks and implementing and/or monitoring controls for these risks, with the strategic goal of ensuring IT governance (Hunton *et al*., 2004). IT governance has become increasingly important in recent years for a myriad of reasons, including a dramatic escalation in IT spending, the growing use of Websites for e-commerce, increased terrorism and cybercrime that can affect information assets, and because corporate governance has received much attention due to corporate scandals, such as Enron, Tyco International and Parmalat (an Italian dairy-food multinational). In addition to these factors, U.S. companies have an increased compliance requirement due to new laws and regulations (all of which impact IT controls), such as the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the Homeland Security Act of 2002, the Sarbanes-Oxley Act of 2002 (SOX), and auditing standards for certified public accounting (CPA) firms promulgated by the U.S. Public Company Oversight Board (PCAOB) (Gallegos, 2004; IT Governance Institute, 2004; Volonino and Robinson, 2004).

While all of these governmental regulations (and several others) have put more pressure on organizations to ensure adequate controls over their IT assets and processes, the Sarbanes-Oxley Act has perhaps been the impetus for the most dramatic increase in the need for more rigorous assessments and testing of IT controls, thereby significantly increasing the demand for more qualified IT audit personnel. Hoffman (2004) notes that the Big Four public accounting firms cannot recruit enough qualified IT audit professionals to assist their clients in doing controls documentation assessments mandated by Section 404 of SOX. Additionally, many companies are realizing their IT audit needs are too expansive to be met using only external auditors, forcing them to add an IT audit component to their internal audit departments. In some cases these companies have even quadrupled the number of IT audits they are performing, leading to an overwhelming demand for IT audit professionals. While Sarbanes-Oxley's focus is on general internal control over financial reporting (to help alleviate corporate accountability problems like Enron and to restore investor confidence in capital markets), the processes used for financial reporting are nonetheless heavily reliant on information technology (IT Governance Institute, 2004). Accordingly, organizations must include IT controls in their mandated assessments

before their executive officers can safely certify on their financial statements that they are in compliance with this law.

Moreover, SOX requires that each corporation adopt and implement an appropriate internal control framework. COSO, based on recommendations of the Committee of the Sponsoring Organizations of the Treadway Commission, is the most frequently adopted framework for compliance with SOX (IT Governance Institute, 2004). However, COSO does not address the details of IT controls (Hunton *et al.*, 2004; IT Governance Institute, 2004), which lead the IT Governance Institute (ITGI) to develop a framework that integrates internal controls for information technology. This framework is called Control Objectives for Information and Related Technology (CobIT). According to a survey of international firms commissioned by the ITGI, CobIT is very compatible with COSO, and a large percentage of its adopters were very satisfied with it as an IT controls framework (Global Communiqué, 2004). However, while there are suitable control frameworks available to deal with Sarbanes-Oxley, the Act "has [nonetheless] fundamentally changed the business and regulatory environment" so much that IT professionals, particularly those in executive positions (such as CIOs) must become "well versed in internal control theory and practice" (IT Governance Institute, 2004, p. 12). This is particularly important given the requirement that a corporation's executive and financial officers (many of whom likely are not very knowledgeable about IT) must certify that their financial reporting systems have adequate controls in place. These certifying officers undoubtedly will rely heavily on their IT executives to assure them that the necessary controls are indeed in place and functioning adequately.

These IT executives will, in turn, have to rely on the rank-and-file IT workers on their staffs to comply with the details of their information technology related controls assessment and testing (both from within the IT department and from the organization's internal IT audit staff). These controls assessment details include activities such as: mapping the information systems that support the financial reporting process; identifying risks in these systems; designing and implementing internal controls to mitigate these risks; and documenting, testing and monitoring these controls (IT Governance Institute, 2004). For example, sales figures on financial statements are the summarized results of potentially millions of individual transactions, each of which is at risk of being misstated because of inaccuracies in the transaction capturing process. Thus applications, such sales and marketing information systems, must have effective controls in place to minimize the risks of misstatements.

One category of such controls is called input controls, which are intended to ensure that only valid transactions are recorded and are recorded in an accurate and complete manner (Hall, 2002). An example of an input control for sales transactions is a limit or range check, which ensures that values, such as prices, do not exceed some upper or lower limit. The purpose is to detect intentional or unintentional errors in input, output and processing functions, such as a sales representative trying to exceed a maximum discount percentage when negotiating prices with customers or keystroke errors that might accidentally shift a decimal point a place or two. An example of auditing such an input control is to thoroughly understand the logic of the programming used in the application to ensure that the controls work as intended and to design test data that subject the application to a variety of undesirable conditions that should be detected by these controls (Hall, 2002). This is an example of a control that can be more broadly categorized as an application control because it is related to a specific transaction processing application. Another broad category of controls is referred to as general IT controls, and a related IT control applicable to this example is controlled "access to programs and data" where only authorized persons should have access to the sales transaction application (IT Governance Institute, 2004, p. 20).

Documenting and testing these IT controls is invariably time-consuming, especially for those organizations not in industries that are used to heavy regulation and compliance. Accordingly, these activities will likely require many hours of IT personnel time. Moreover, Sarbanes-Oxley requires a company's outside auditing firm to attest that the company's management has made an adequate assessment of internal controls over its financial reporting processes, which "are [inherently] driven by IT systems" (IT Governance Institute, 2004, p. 19). As noted by Hoffman (2004, p. 16), [u]nlike Y2k work, Sarbanes-Oxley compliance efforts are expected to be an ongoing exercise in which companies will have to document their internal controls on a quarterly basis and have them certified by auditors annually." In short, many new qualified entry-level IT auditors (both external and internal to the organization) will be needed to document and assess the IT components of these controls in order to be in compliance with SOX requirements.

SKILLS REQUIRED FOR AN EFFECTIVE IT AUDITOR

While we have discussed reasons for the increasing demand for new IT auditors, we have not explicitly outlined the skills that can be reasonably expected of a candidate for an entry-level IT audit position. The material for this section was synthesized from both the literature and from actual conversations with managers hiring information systems auditors and with some recently hired entry-level IT auditors. Note that in many instances, the comments from these managers and new hires are consistent with the skills noted in the literature we have reviewed.

According to Hunton *et al.* (2004), an IT auditor usually holds a bachelor's degree with a major in MIS, computer science, and/or accounting, but could conceivably have a variety of majors. Hunton *et al.* (p. 8) add that, although knowledge of technical topics (e.g., operating systems, network security, e-commerce) is "highly desirable, it's probably most important that an individual planning a career in IT audit just genuinely 'like' computers and technology." This notion was confirmed by one insurance company's IT audit hiring manager who was recruiting for Miami business school graduates with any major (but who also had a high GPA and good aptitude for technology).

Hunton *et al.* further note that "[w]hile technical skills are important to an IT auditor, general communication and business skills probably matter even more" (p. 8). Under desirable personal and business skills, these authors discuss interpersonal and teamwork skills because IT auditors need to work with other auditors (both financial and IT auditors and both internal and external auditors) and gain acceptance and support from the client (or audited group). In addition, IT auditors must possess an understanding of business processes because the information systems being audited support the business functions of an organization. Accordingly, knowledge of accounting (or an accounting major or minor) is a plus, primarily because accounting focuses on processes and because most accountants have studied auditing. Other useful skills (or co-majors) include marketing (in order to sell services and suggestions about controls to clients) and decision sciences (to be able to use statistical tools to analyze the sheer volumes of data that are involved in financial reporting processes). Finance is also a pertinent co-major for those IT audit positions in the various financial service industries.

From our research and experiences, we have noted additional skills and qualities that will help ensure success in the IT audit profession. Perhaps foremost is that an auditor must be the consummate professional. For example, auditors need to attend to the important nuances of phone and meeting etiquette (e.g., being on time, using appropriate language, etc.) and be courteous to those responding to audit requests (e.g., give them sufficient lead time). Auditors also need excellent communication skills in order to create effective audit plans and to express findings, concerns and recommendations to upper management, both in writing and during meetings. In addition, auditors must be able to work effectively with people at all levels of an organization. In short, IT auditors must continuously work to portray the aura of a professional, which is one of those important interpersonal skills that can be called upon to "overcome the negative bias towards auditors of people whose work is under their scrutiny" (Hunton *et al.*, 2004, p. 8). Finally an IT auditor needs to understand the concept of risk as it is related to IT and acknowledge that auditors (even internal auditors) have to be independent (because management is actually responsible for assets and their controls). This independence must manifest itself both in form and appearance; auditors must always give the appearance of being independent, such as using language in oral conversations that implies manage-

ment responsibility, and auditors need to formally express this independence by stating unequivocally (in writing) that management is ultimately responsible for controlling its assets.

Moreover, the relative importance of some these entry-level skills are predicated on a given position's education requirements, which appear to vary slightly from public (i.e., CPA firms) to private (i.e., internal) auditing organizations. In our metropolitan area, it appears that public accounting firms have a fairly strong preference for entry-level IT auditors who have an accounting degree with MIS or IT as a double major or minor (partly in response to more stringent professional certifications required for CPA firms by the PCAOB). On the other hand, companies that are not accounting firms appear to have a broader hiring perspective and will hire business graduates without an accounting degree, but rather with an MIS major or perhaps with another business major (such as finance) and an MIS minor or concentration. These companies, after all, are charged with documenting, assessing and testing IT controls and need to hire graduates with information technology and systems acumen, which does not necessarily require a detailed understanding of accounting and auditing at the IT control level. Rather, these professionals need a detailed understanding of IT and of its associated risks and security issues.

WHAT CAN MIS DEPARTMENTS (AND BUSINESS SCHOOLS) DO?

Singleton (2003) calls for more research and education on the ramifications of SOX on the IT audit profession from an accounting curriculum perspective. However, as suggested in this paper, the impact of SOX is similar for the MIS curriculum, and we would provide a service to our students by creating an awareness of related topics, such as IT governance, Sarbanes-Oxley, systems security, risks and controls, CobIT, IT auditing, and ISACA, which is an international organization dedicated to the IT audit profession. Moreover, we should call to the attention of undergraduate MIS majors the possible career opportunities in IT auditing. Fortunately, ISACA provides a Model Curriculum on their Website for those institutions desiring to add courses and content on these topics (ISACA, 2004). In addition to incorporating some of these suggestions into MIS curriculums, educators can contact the ISACA professional chapters in their areas to inquire into the possibility of creating a student ISACA organization at their school that is affiliated with a local ISACA chapter (see www.isaca.org). This affiliation can manifest itself in varying ways, but one of the most powerful ways to draw attention to MIS majors is having professionals from these local chapters come to campus to talk about careers in IT audit.

Another way to draw attention to the IT audit profession is to discuss some of the professional credentials and certifications that are available in the profession (similar to how the accounting discipline continuously reinforces the importance of the CPA designation for their majors). According to Hunton *et al.* (2004), perhaps the most prestigious international credential available to entry-level IT auditors is the Certified Information Systems Auditor (CISA) designation offered by ISACA (see www.isaca.org). This designation requires: the successful completion of the CISA examination; five years of professional experience in IS auditing, control or security (some of which can be waived, such as by earning a college degree); adhering to a code of professional ethics; adhering to a code of auditing standards; and maintenance of skills through continuing professional education.

The different weights assigned to the content areas of the CISA exam supports our theory that IT skills are more important than general knowledge of auditing. The exam is divided into seven content areas, each weighted according to its importance. The sections receiving the highest weights are "Protection of Information Assets" (representing

25% of the exam) and "Business Application System Development, Acquisition, Implementation and Maintenance" (16% of the exam). These subject areas are often included in MIS curriculums, giving entry-level IT auditors with a MIS or related degree an advantage when preparing for this certification. Another potential designation also offered by ISACA is the Certified Information Security Manager (CISM), which is intended for experienced security managers. Other pertinent certifications noted by Hunton et al. include Certified Fraud Examiner (CFE), Certified Information Technology Professional (CITP), and Certified Internal Auditor (CIA).

CONCLUSION

IT audit is also an excellent career choice for new graduates (from MIS or related programs) whose ultimate goal is a career in IT, but are unsure where their interests lie or are lacking the technical skills to jump directly into an IT role after graduation. All areas within IT are exposed to auditing, giving IT auditors an overview of the entire IT environment (e.g., infrastructure). Moreover, the demand for IT audit services and professionals is increasing. For example, a July, 2004 search for "IT and information systems auditors" on Monster.com revealed over 1400 jobs available across the U.S. Indeed the demand for IT audit professionals exceeds the supply (Gallegos, 2003), and thus many companies are willing to hire MIS students straight out of college with little accounting and auditing education and train them to be IT auditors. Consequently, MIS/IT educators should be aware of this growing trend and act accordingly for the best interests of their students.

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