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EVALUATING THE FACTORS AFFECTING ON THE QUALITY OF IT AUDIT (CASE STUDY: AUDITORS MEMBER OF THE OFFICIAL AUDITORS SOCIETY OF IRAN)

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ABSTRACT

The importance of information technology (IT) auditing has grown with increased reliance on IT for business operations and new regulations regarding the assurance of IT for these operations. Prior work on IT and financial auditing has suggested several general frameworks that may affect IT audit quality; however, the prior work has not provided measurable constructs nor has it considered whether these proposed constructs are the same or different. Building on prior work that has proposed frameworks of IT audit quality, we identify and evaluate potential constructs suggested by these frameworks as well as financial auditing literature. We develop a survey tool and ask IT and financial accounting practitioners to assess the impact of these items on IT audit quality. A factor analysis is used to refine the set of IT audit quality factors identified, and we are able to provide insight into the prioritized impact of each factor on IT audit quality. In comparison to prior research, we find that additional factors are significant for IT audit quality and that the relative importance of the factors for IT audit quality differs for IT versus financial auditors.

Keywords: Factors Affecting, Audit, Information Technology, Business Operation

INTRODUCTION

The purpose of this study is to analyze attributes identified in prior research that are thought to impact the quality of the information technology (IT) audit process. Prior research has identified several attributes that are argued to impact IT audit quality, both positively and negatively. These attributes include various characteristics of the process or system being audited, the procedures or techniques used to perform the audit, traits of the audit personnel themselves, organizational and environmental conditions, as well as many others. The natural extension of this work is to develop a structural model of IT audit quality and its antecedents; however, to date, there has not been an examination of these attributes to identify the underlying measurable components of IT audit quality. Additionally, the financial audit literature suggests other audit quality attributes which may also provide insight into IT audit quality. Therefore, the purpose

of this research is to rationalize the potential constructs and develop potential instruments that allow for measurement of these constructs.

Recent research has identified the importance of IT audit to organizations and has called for additional research in this area (Weidenmier and Ramamoorti, 2006; Curtis et al., 2009). This attention to IT audit has been driven by two primary reasons, 1) increased spending and dependence on IT for business operations, and 2) new legislation and professional requirements related to the audit of these operations. Demand for IT services to support key business activities has driven the level of global IT spending to over \$3.6 trillion for 2011 (Gartner Group, 2011). This reliance on IT and the investment it entails require an increased level of assurance that these systems deliver what they promise. IT audits are widely used internally to examine the operations, effectiveness, controls, and security of critical

systems to identify opportunities for improvement and areas of weakness.

Discussions by the Public Company Accounting Oversight Board (PCAOB) Standing Advisory Group (SAG) regarding auditor's knowledge of information systems (IS) have emphasized the importance of information technology (IT) in general, and IT auditing specifically, to the external financial audits of public companies. In addition to the United States' Sarbanes–Oxley Act (SOX), a plethora of other laws, regulations, and standards have all necessitated additional IT assurance related to information security and privacy.

These include, but are not limited to, the Health Insurance Portability and Accountability Act (HIPAA), Canada's Personal Information Protection and Electronic Documents Act (PIPEDA), the Payment Card Industry Data Security Standard (PCI DSS) and the European Union's Data Privacy Directive. In addition to these regulatory compliance requirements, auditors of public companies in the U.S. are bound by auditing standards that require adequate IT expertise to assess controls; for an insightful discussion of these standards please see (Curtis et al. 2009).

IT audits may serve various objectives and multiple parties within an organization, and therefore there may be different definitions of IT audit quality. These definitions may include ideas such as impact or effectiveness, completeness as related to different standards, and efficiency or cost. One purpose of IT audits is to provide management with assurance that a system or automated process is meeting its objectives. Specifically, the focus may be on managements' control responsibilities over computer-based information assets and processes. In these cases, specific standards developed by groups such as ISO, PCAOB, or AICPA may assist in defining certain IT audit quality. For internal operational audits, the focus is usually on performance, i.e. cost reduction or improvements in productivity. Therefore the focus may be on the overall impact of the audit findings and the cost of performing the audit. Regardless, to perform an IT audit efficiently and effectively, firms must make appropriate decisions regarding the scope, resources (e.g., personnel or computer-automated audit tools), tasks or activities to be performed, methods, techniques, and other “inputs” to the IT audit process. Management's decisions regarding specific resources to deploy for a specific IT audit should attempt to maximize the overall audit quality and minimize the cost as related to their specific IT audit objectives. This also requires

a consideration of other attributes that might impact the performance and outcome of the IT audit, but over which they have no or little control. These attributes might include the availability of key auditee personnel, the infrastructure or architecture on which a system is running, or the organizational structure of a business unit being audited.

One objective of this research is to assist these decision-makers by providing additional information regarding the relative importance of the attributes previously identified in the research and the underlying components that these attributes comprise. We believe that these could be used to help guide audit management's planning by making tradeoffs among the attributes. We also analyze whether differences exist with regard to perceptions of these components between key constituents.

We believe that there are four primary contributions attributable to this research activity. First, we identify and rationalize specific attributes associated with the IT audit quality domain, including attributes from the general audit quality domain that are relevant to IT audit quality. Specifically, we begin with the general framework proposed by Merhout and Havelka (2008) and expand this work by integrating other attributes from the IT audit domain and then relevant items identified in the financial audit quality domain.

Second, we evaluate the relative importance of these attributes to IT audit quality. By evaluating the individual attributes, we can compare our results to the work of prior researchers that have done similar work in the general audit quality domain to determine if IT audits have different requirements or peculiarities.

Our results indicate that there is a different priority in the skills and knowledge required for IT audit quality as compared to attributes identified in prior financial audit quality literature.

Third, we perform a factor analysis to determine the underlying components of the attributes identified.

In general, factor analysis allows us to reduce a large set of items into a smaller set of composite components that are more easily manageable. The long-term goal of this stream of research related to IT audit quality is to develop a testable model of constructs that may impact IT audit quality. The research presented in this paper is a critical, initial step in rationalizing and developing measurable constructs related to IT audit quality. This paper is similar to Carcello et al. (1992) who focus on identifying the critical factors related to financial audit quality.

Fourth, we analyze differences in perceived importance of the IT audit quality factors generated by the factor analysis between distinct groups involved in the IT audit process. We identify differences in perceptions between IT and financial auditing participants. This may aid in developing a better understanding of expectations and perceptions of the IT audit process and quality for these groups, and, hopefully allow management to improve audit planning and execution so all parties perceive similar (higher) quality.

Thus, according to the capabilities of information technology, in the study we are looking into what factors are effective in the quality of IT audit? In order to answer this question six hypotheses are designed and according to these assumptions we identified the research goals and with respect to the objectives and assumptions will pass the course of research.

BACKGROUND

This work was directly motivated by the call for additional research in IT audit (Weidenmier and Ramamoorti, 2006) which suggests the need for greater understanding of IT and the related audit process. Additionally, a recent survey of more than 450 internal auditor professionals conducted by Protiviti identified IT auditing as one of the top two areas that requires improvement (Filipek, 2007). Potential reasons for this result include: a) advances in information technology and increases in IT spending which have resulted in organizations relying on software and technical infrastructures to support most businesses processes, and b) laws, such as SOX, which require all information systems used to produce financial statements be documented and tested for compliance with management's IT control objectives. The increased demand for IT audit services emphasizes the importance of performing these services in the most efficient and effective manner. As a result, additional research is needed to understand the potential issues in performing IT audits and critical factors that may be related to the overall quality of the IT audit (Weidenmier and Ramamoorti, 2006).

Within the IT audit literature, there are a variety of resources to guide practitioners at the operational level. For example, the Information Systems Audit and Control Association's (ISACA) Control Objectives for Information and related Technology (COBIT®) provides a detailed series of potential controls and checklists.

Additionally, there are many publications (e.g., Davis, 1997; Bagranoff and Vendirzyk, 2000;

Petterson, 2005; Brody and Kearns, 2009) and textbooks (e.g., Hunton et al., 2004a; Hall and Singleton, 2005) which provide overviews of IT audit processes and specific direction for audit tasks. However, there has been little academic research on the IT audit process, and specifically on what factors influence IT audit quality and on the relative importance of each factor. Previous IT audit studies have focused primarily on specific aspects or characteristics of IT audit or assurance tasks. For example, recently authors have explored the IT proficiency of auditors and the importance of IT knowledge for assurance practitioners as one critical component of IT auditing (Carnaghan, 2004; Greenstein and Mckee, 2004; Leader, 2004; Wilkinson, 2004; Brazel, 2005; Curtis et al., 2009). Additionally, researchers have explored the potential impact of group dynamics and group support systems (Bamber et al., 1998; Carnaghan, 2000; Leech, 2000; O'Donnell et al., 2000a, b) and the impact of various technologies such as EDI, ERP or XBRL on auditing (Vanecek et al., 1983; Hansen and Hill, 1989; Morris and Pushkin, 1995; O'Leary, 2002; Wright and Wright, 2002; O'Donnell and Schultz, 2003; Hunton et al., 2004b; O'Donnell, 2005, 2006; Boritz and No, 2009; Brody and Kearns, 2009; Kuhn and Sutton, 2010; Srivastava and Kogan, 2010). Researchers have also used case studies of IT audits to identify potential concerns and improvement opportunities for IT audit (Smith, 2007). The impact of this research is that a broad set of attributes that may influence IT quality has been identified. Additional research related to IT audit has investigated the impact that IT has on financial audit, internal controls, or other projects. Examples include work that investigates the changing role of IS audit and auditors in US accounting firms (Bagranoff and Vendirzyk, 2000; Vendirzyk and Bagranoff, 2003; Omoteso et al., 2010); the IT-related activities of auditors and the use of computer-based tools (Lovata, 1990; Burton, 2000; Hermanson et al., 2000a; Jackson, 2000; Bierstaker et al., 2001; Janvrin et al., 2009); the effect of internal control reliability on IT audit hours and fees (Daigle et al., 2005); the effect of IT on auditor detection of misstatements (Messier et al., 2004); the development of metrics for information systems assurance and the identification of high risk modules (Sherer and Paul, 1993; Havelka et al., 1998; Salterio, 1998; Stockton, 1998); and the general implementation of technology for auditing (Dowling and Leech, 2007; Curtis and Payne, 2008; Dowling, 2008). Again, this research provides individual attributes that may influence audit quality; however,

little has been done to consolidate and rationalize these factors into a framework of IT audit quality. Recent work by Merhout and Havelka toward developing a theory for the IT audit process utilized group data gathering techniques with IT audit practitioners, internal and external, to create a framework of logical factors related to IT audit quality (Havelka and Merhout, 2007; Merhout and Havelka, 2008; Havelka and Merhout, 2009). They identified a large (over 260) set of attributes (referred to as factors by Merhout and Havelka) that were suggested by practitioners as “critical” to the IT audit process. While they logically categorize the attributes identified, Merhout and Havelka do not provide any empirical evidence to support their framework or to evaluate the importance of the attributes or the categories they suggest. Therefore, one purpose of this research is to empirically analyze the underlying attributes to better understand the groupings of the proposed factors. Additionally, Merhout and Havelka intentionally focus on IT auditors in their data gathering; however, there may be overlap with the concepts of financial audit quality that should be considered. The primary approach used within the financial audit literature to identify audit quality attributes has been literature reviews and validation surveys. There are many works in the general audit literature that consider individual audit quality attributes (Rudolph and Welker, 1998; Hun-Tong and Kao, 1999; Ghosh and Moon, 2005; Carey and Simnett, 2006; El-Masry and Hanson, 2008; Arena and Azzone, 2009); however, there are two primary works which review the literature and identify measurable attributes. First, Schroeder, Solomon and Vickrey (1986) surveyed audit committee chairs and audit partners on 15 specific “factors” of audit quality from prior research and identified eight of these as having a strong or very strong impact on audit quality, including executive involvement, planning/conduct field work, communication to management, independence, technical competence, team experience, quality control, and communication to audit committee. Second, the approach of Carcello et al. (1992) extended Schroeder et al. in that they developed a broader survey of audit quality attributes and administered the survey to a combination of external audit, internal audit, and business professionals. Using a factor analysis technique, Carcello et al. identified 12 factors overall, including four primary factors: client experience, industry experience, responsiveness to client needs, and compliance with GAAS.

An alternative approach used to identify audit quality factors is through direct solicitation from audit professionals using interviews and group-based approaches. The primary work in this area is by Sutton and Lampe (Sutton and Lampe, 1991; Sutton, 1993; Lampe and Sutton, 1994). One of the unique benefits of this approach is the potential detail and rich data set developed. These studies identified 19 specific attributes.

Examples of the attributes identified by Sutton and Lampe's studies include audit team expertise, audit timing requirements, audit manager involvement, and prior notes and work papers.

Overall, our review of the literature suggests many attributes of IT audit quality. We believe that many of these attributes are semantically similar and overlap in definitions. For example, the single planning/ conduct field work construct identified by Schroeder et al. may overlap with the audit methodology concepts of Merhout and Havelka and with the fieldwork concept of Carcello et al. Similarly, we believe that executive involvement is one aspect of the supervision concept. An additional example where overlap is possible and refinement of the definition may be possible is the idea of audit skills which may include components of other attributes including auditor preparation, technical competence and/or social/ communication skills. We believe that rationalization of this set of potential IT audit quality attributes is required before a testable model can be developed. Based on this prior research, we prepared an initial set of attributes to analyze. A description of the general approach and method used to perform our further analysis follows.

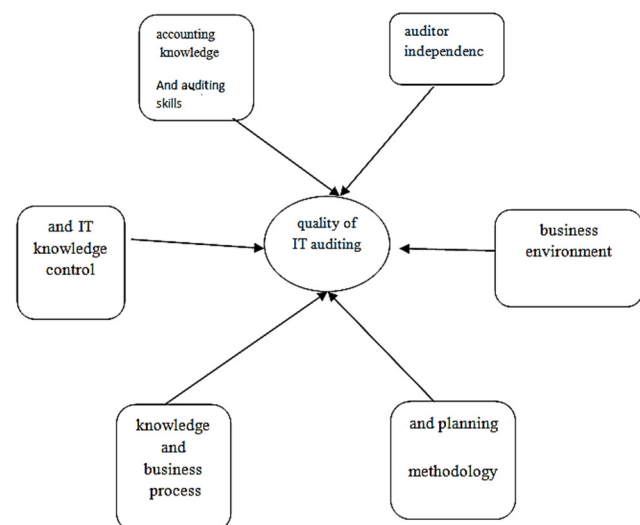


Diagram.1. The research conceptual model

Source: Havelka et al. (2013)

Research hypotheses

The research hypotheses are as follows:

- The auditor independence has positive impact on audit quality of IT.
- Knowledge of accounting and auditing skills has a positive impact on audit quality of IT.
- IT and controls knowledge has positive impact on audit quality of IT.
- Knowledge of business process and experience has positive impact on audit quality of IT.
- Planning and methodology has positive impact on audit quality of IT.
- Business environment has positive impact on audit quality of IT.

RESEARCH METHOD

This research in terms of the purpose is practical. Because at the end of the research efforts to provide solutions to the research subject, and the results presented for the population studied. On the other hand due to the fact that in this study, factors affecting the quality of IT audits will be examine, so this research is considered as causal study. In this study, for data collection needed to test the hypotheses of the research, the field methods used. Also, the data were collected using questionnaires.

Questionnaire validity and reliability

The initial questionnaire of the study was designed to evaluate the validity of the questionnaire and guide professors and advisors observed it, after corrective measures of the questionnaire, at next stage, 30 pcs was distributed among the statistical population and

the opinions of the respondents about designed questions has been collected and ultimately, the final questionnaire was designed in order to distribute in wider scale.

In this research to evaluating and measuring the reliability, in initial stages of study, the data of 30 questionnaires has been collected, then to determine the validity, the SPSS software is used and the obtained Cronbach alpha coefficient for 29 questions was determine as 0/744 and regarding that it is more than 0/7, so the study questionnaire has enough validity.

Statistical population and determining the sample size

The statistical population of this research is consisted of accountants and financial experts of Medical Sciences university of Markazi province which are 227 persons.

To determine the sample size and according to limitations of statistical population, the Cochran formula has been used for limit population. The achieved statistical population by this formula was 144 persons which after questionnaire distribution using non-random sampling method (available), ultimately 151 questionnaires were usable.

DATA ANALYZING METHOD

To data analyzing in this study, the t-test (mean test of a society) is used.

Data analyzing and hypotheses test

Table.1: Data analyzing and hypotheses test

hypothesis result	3 - value test					index	
	level confidence %95		significance level	edom fre degree	t-coefficient		mean
	higher limit	lower limit					
accepted	0/5746	0/3791	0/000	150	9/637	3/4768	Maintaining the independence of auditing team
accepted	0/9044	0/7401	0/000	150	19/779	3/8223	accounting knowledge and auditing skills
accepted	1/3091	1/1545	0/000	150	31/494	4/2318	IT and knowledge of controls
accepted	0/5049	0/2854	0/000	150	7/115	3/3951	business process knowledge and experience
daccepte	1/1125	0/9723	0/000	150	29/371	4/0424	planning and methodology
accepted	0/4686	0/3559	0/000	150	14/464	3/4123	business environment

CONCLUSION

The first hypothesis, measures the effect of maintaining the independence of auditing team on audit quality of IT. Given that the level of significance (Sig) is less than 0/05, and on the other

hand, the lower limit (0/3791) and higher limit (0/5746) both are positive, it becomes clear that the independence maintenance of audit team has positive impact on audit quality of IT and this hypothesis is accepted. So it can be concluded that with increase /

decrease of maintaining the independence of the audit team, the audit quality of IT will increase / decrease.

According to the second hypothesis, knowledge of accounting and auditing skills has a positive impact on audit quality of IT. Given that the level of significance (Sig) is less than 0/05, and on the other hand, the lower limit (0/7401) and higher limit (0/9044) are both positive, it becomes clear that knowledge of accounting and auditing skills has a positive impact on audit quality of IT and this hypothesis is accepted. So it can be concluded that with increase / decrease of accounting knowledge and audit skills, the audit quality of IT will increase / decrease.

Based on the third hypothesis, IT and knowledge of controls has a positive impact on audit quality of IT. Given that the level of significance (Sig) is less than 0/05, and on the other hand, the lower limit (1/1545) and higher limit (1/3091) are both positive, it becomes clear that IT and knowledge of controls has a positive impact on audit quality of IT and this hypothesis is accepted. So it can be concluded that with increase / decrease of IT and knowledge of controls, the audit quality of IT will increase / decrease.

The fourth hypothesis, measures the impact of knowledge of business process and experience on audit quality of IT. Given that the level of significance (Sig) is less than 0/05, and on the other hand, the lower limit (0/2854) and higher limit (0/5049) are both positive, it becomes clear that knowledge of business process and experience has a positive impact on audit quality of IT and this hypothesis is accepted. So it can be concluded that with increase / decrease of knowledge of business process and experience, the audit quality of IT will increase / decrease.

Based on fifth hypothesis, planning and methodology has positive impact on audit quality of IT. Given that the level of significance (Sig) is less than 0/05, and on the other hand, the lower limit (0/9723) and higher limit (1/1125) are both positive, it becomes clear that planning and methodology has a positive impact on audit quality of IT and this hypothesis is accepted. So it can be concluded that with increase / decrease of planning and methodology, the audit quality of IT will increase / decrease.

According to sixth hypothesis, business environment has positive impact on audit quality of IT. Given that the level of significance (Sig) is less than 0/05, and on the other hand, the lower limit (0/3559) and higher limit (0/4686) are both positive, it becomes clear that business environment has a positive impact on audit

quality of IT and this hypothesis is accepted. So it can be concluded that with increase / decrease of business environment, the audit quality of IT will increase / decrease.

Practical suggestions

The judgment basis of audit team, is selection and evaluation of the evidences, on this basis the audit team should have freedom and independence. Here's emphasis on independence is because testing and reporting processes, is the auditor's responsibility not of information provider. In fact, the audit team is in testing and reporting process, should be impartial role, not that be defender of interests of the entity. And this institutional independence will lead to releasing of audit team members from influence of information provider. Honesty and fairness in access to sensitive and careful judgment is required. The findings should be based on the auditor's judgment. Private interests should have no role in the judgment of the auditor and personal interests should not have any role in the judgment of the auditor. The auditing validity requires a neutral attitude (independent mental attitude), which adds to the reliability of the auditor's judgment. Impartial collecting and assessment of the evidences, is of necessary conditions for the validity of the auditors' judgment. Impartiality forces the auditors to fair behavior, honesty and free of conflicts of interest. To reassure the information users and acceptance of unbiased opinions of auditors, s/he should have no direct financial interest or indirect important financial interest in the entity. Otherwise, users may consider the judgment as oriented. Having such relationships undermine auditor independence and will lead to his/her disqualification.

As you can see, the IT influences on the qualitative characteristics of accounting information which this impact applied from the reporting. In fact, IT leads the reporting to the timely financial reporting and this type of reporting, provides information with different characteristics that regarding growing advances of IT, it is expected to improve its impact on reporting and consequently the qualitative characteristics of accounting information. Using IT, the information will become more related and reliability and comparability of data will also increase. On the other hand, according to the information needs of users and disadvantages of the current reporting model (Traditional), it is clear that the financial reporting model ultimately should lead to the timely financial reporting. Therefore, it is recommended that the accounting system of country, move in this course. In this way that, design and develop the accounting and

auditing systems compatible with new technology developments, and keeping pace the reporting and comprehensive disclosure of accounting and finance with the rapid changes in the business world. It is suggested that if something came to mind of audit team members about doing a better job, offer to management. It is proposed that the members of the audit be aware of internal controls and business process knowledge to carry out duties better. And also suggested that members of the audit team be aware of information security and data processing and in this regard ensure that data security is not to endanger. Audit team members should have full knowledge about IT and auditing systems and be up-to-date. For example, by participating in training courses and classes about new audit system, they can keep their information up to date.

It recommended to the audit team to use the services of consultants in specific cases and in times of trouble to overcome their confusion. Also it suggests to employer to create a special order in the related organization in order that all programs implement in regular basis so that audit team is to be able to function under the administrative order. It is recommended to the employer to be agreed with the organizational changes in the organization and support them for example, the automation level within the organization and processes or in audit system.

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