A Study of the Audit Information Technology Usage and Perceived Importance by Auditors in Iran

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Considering the recent progress in technology in recent years, the auditors will not be able to audit the computer information systems, unless the auditors have sufficient skills in the field of information technology (IT). This article reviews the knowledge of information technology level and its importance from the viewpoint of the Iranian auditors. The statistical Society consists of senior auditors, supervisors, senior supervisors, managers, and working partners in Iranian firms of audit. The information was gathered through a questionnaire contained 30 information technologies (including various emerging technologies). In total 600 questionnaires were distributed manually and electronically in which the received responses was 84. The analysis of 30 technologies in 5 underlying structures (General office automation, Audit Automation, Accounting firm office automation, E-Commerce Technologies, Systems Design, and Implementation) shows that the Iranian auditors have sufficient knowledge only in general office automation structure and lack significant knowledge for other four structure. On average, The accounting firm office automation received the highest mean value for the IT importance and Accounting firm office automation received the highest mean value for the IT knowledge, whilst e-commerce technologies receives the lowest mean value for both importance and IT knowledge. So the IT knowledge among the auditors is less than their understanding toward it importance.

Keywords: information technology knowledge, IT knowledge, IT importance, auditors, independent auditing, information systems auditing.

Introduction

The increasingly dynamic nature of business poses new challenges on the design and development of information and communication technologies. Effective integration and the openness of technologies play ever more critical roles in the modern networked business environments.

IT is a key element in remove time and space constraints, better and faster access to information, to date, and is of such cases. In other words, technology, changed methods of doing things, and has led infrastructures that is made of paper be converted to electronic infrastructure, that the electronic exchange of information in terms of call. Widespread and comprehensive of IT as a useful tool with many applications, causing many changes in all economics and social fields (Salehi and Abdipour, 2011). In this range, the increasing use of accounting and auditing professionals of information technology has not been exempted. Particular, nature of this profession is such that it requires attention to the pro account, is about accountability and transparency (Gleim, 2006).

IT increases transaction processing accuracy and speed, and can lead to competitive advantage for many

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firms in terms of operational efficiency and cost savings and to reduce human errors (Salehi and Husini, 2011). With growing competition in the profession, audit firms need to audit service quality have realized. That to achieve this purpose, auditors should be independent, professional competent and have to ethical competence as the unique characteristics of the auditor; from where it qualified professional auditor is required to observe complex issues, so competence in IT is very important for Professional Accountants due to its widespread use in the business world (the International Federation of Accountants, 2001). For this reason, the International Federation of Accountants Education Committee (2006) has stated, "Information technology is widespread in business, and professional accountants to compete in this technology require."

In future years, paperless audit will become commonplace, as businesses increasingly shift to paperless systems auditing software is changed developed that allows auditors to complete most procedures on-line (Bierstaker et al, 2001). Due to the increasing dependence on business to computer information systems such as e-commerce, independent auditors must be able to assess the reliability of financial statements prepared on the basis of computer data and analysis of their results are. This is important because auditors judge is effective the quality of audit (Bonner, 1999), other hand, decision making tools may be effective on auditor judgments (Janvrin et al., 2008). Hence, to effectively audit on-line systems, auditors need to incorporate on-line audit software as their primary audit tool and gather evidence electronically (Bierstaker et al., 2001).

The remainder of the paper is organized as follows. In the next section are discussed the impact of IT on the accounting and audit profession and history. Next, the paper discusses the methodology and presents the results of the study. Finally, provide a summary of conclusion and limitations of the study and are suggested important results for future research.

Background of Hypotheses

The primary function of external auditing is to increase the reliability of audited financial statements. This function can be met if the audit be provided with sufficient quality. Audit quality depends on the auditor's ability (expertise) in detecting errors and auditor's willingness (independence) to report such errors (De Angelo, 1981). Nowadays in the world, financial statements audited by independent auditors, very suitable tool for data transfer is considered. The auditors who ultimately about integrity and credibility are commenting on financial statements, major role in improving corporate information systems have. The rapid growth of technology and the use of computers in business result in more IT auditing and internal control standards and guidelines to assist auditors in their roles and responsibilities.

The international Auditing Standards No. 401 states that the auditing process for both internal auditors and external auditors is changing rapidly. Factors that are causing these changes include: globalization of business, advances in technology, demand for value-added audit, the organizational structure of the client's computerized information systems (CIS) activities, and the availability of data sources documents. Some computer files and any other documents that may be required in audit only exist for a short period of time or only in machine-readable form. This systems increase the overall complexity of computerized information systems and the complexity of the specific applications, so, they may affect on the audit. Consequently, accounting information systems increase the risk of audit and require further attention. The auditor should understand of the importance and complexity of the computerized information systems activities and availability of data for use in audit. Accordingly, the auditors should have

sufficient knowledge of CIS for plan, direct, monitoring and evaluation work performed. The auditor should also consider whether specialized CIS skills are needed in an audit (Abu-Musa, 2008).

Audit standards (AICPA 2007, AU 319.30) require that an IT audit must be performed when:
The client utilizes complex business systems and relies extensively on IT controls; the client has replaced or made any significant changes to its IT systems; the client extensively shares data between systems internal organizational systems; the client is involved in electronic commerce the client uses emerging technology; and significant amounts of required audit evidence is electronic.

International Federation of Accountants (2006) states that changes in IT are pervasive, they are increasingly in business as a whole, and have influence in certain business processes. For example, professional accountants need to understand both IT and manual systems, through which the transaction is started, registration, processing and reporting are, and how they are interacting and evolution.

- **The IFAC defines IT as:**
  "…hardware and software products, information systems operations and management processes, and the human resources and skills required to apply those products and processes to the tasks of information production and information systems development, management, and control (IFAC, 2001). Definition is a rather broad based definition since it includes "human resources and skills" in addition to hardware and software products. To study Greenstein and McKee (2004), Greenstein et al. (2008) and Janvrin et al. (2008), Noor Aziz and Zainol (2009), this study limited definition of information technology only focused on hardware and software products. IT audit can be defined as the process of gathering and evaluating independent and impartial of evidence and operation of information systems for providing reasonable assurance to the management about whether a designed computer system to maintain data integrity, safeguard assets, allows organizational goals to be achieved effectively and uses resources efficiently (Yang and Guan, 2004). Auditors will not able to perform audit of computer systems, unless gain the productivity and effectiveness of the audit using the new technology (Noor Azizi and Zainol, 2009). So in the current information age, IT knowledge is a very important element of auditor's experience and expertise. Because information storage on the computer systems has more efficient, and the number of transactions done in electronic form is expanding rapidly. As IT changes occurs faster, auditors should are synchronized with emerging technological changes and their impact on organization's data processing system, as well as alter the audit procedures (Rezaee and Reinstein, 1998). For audit conducted electronically, auditors will use the accounting software as the primary tool to gathering electronic evidence. Therefore, electronic worksheets increase audit effectiveness, because the information could be issues between auditors in different parts of auditors using mail or remote access software. If necessary, years ago auditing worksheets can easily be moved to the current year. Therefore, auditors are expected have higher level of IT knowledge and skills than the average accountants because they must audit customers with various information systems (Greenstein et al, 2008). Technologies such as electronic data exchange, image processing, and electronic file transfer, severity the nature of the today process audit will change.

Information technologies are changing the nature and economics of accounting activity. Society

expects auditors have to necessary competence to do the required work. If auditors have less IT knowledge, then this may result in provision of lower audit quality, that this ultimately leads to reduce confidence shareholders level are to the financial statements (and ultimately lead to a lower level of trust by stakeholders in financial statements) Also, if auditors have lower IT self-efficacy, this may impact their perceived usefulness of emerging technologies, and lower the intention to adopt the technology. This means that is increased the demand for more accurate than the result of professional works and can not be relied on traditional methods and systems. Undoubtedly, in the light of large scale business failure such as Enron, MCI-WorldCom and Parmalat, one of the most critical roles is auditing. IFAC (2006) states, professional accountants should acquire to need professional knowledge and skills to succeed as a professional accountant. IFAC members should ensure that candidates possess these IT skills before qualifying as professional accountants (IFAC, 2006). Chang and Hwang (2003) state that according to the dynamic nature of IT and its widespread adoption in business organizations, college education and professional training effectively and efficiently must prepare accountants to meet these challenges."

The purpose of this study examination effect of IT in the auditing process and discuss about future trends IT applications for audit profession. Finding from of this study is important as it would extend the existing literature on Iranian auditors' IT knowledge. In addition to the auditors' knowledge level, this study would identify the Iranian auditors' perception towards the importance of recent ITs in their audit works in the specific context and are important for professional auditing standards regulators. This is important because IT sophistication levels are different in different countries are different. Thus, the findings of studies conducted in developed countries may not be applicable in the context of developing economies like Iran. Results would be useful for auditors about on how advances in technology, improve auditing efficiency and effectiveness in the future. Finally, because we reviewed IT use and its importance, the Iranian auditors may use of results as a criterion for admission of IT.

It is interesting to note that despite the impact of information technology in professional accounting and call previous research, few studies using of IT to be studied, or the importance of applications and tools particular were conceived (Arnold and Sutton, 1998; Liang and et al., 2001). The changing role of IT in audit professional and rapid changes in IT may help to important of this research. We recommended following questions with regard to auditors' IT knowledge:

First question: What kind of information technology is more important for Iranian auditors?

Second question: what kind of information technology use usually by Iranian auditors?

Literature Review

While the impact of IT in business has grown exponentially in the past two decades, few studies examine the use and perceived importance of IT, particularly outside of the largest audit firms (Fischer 1996; Banker et al. 2002). Current standard, encourage auditors and audit firms to adopt IT and use IT specialists, when necessary (AICPA, 2001, 2002, 2005, 2006). But researchers and auditing practitioners have been directed about what IT should to adopt. Review Literature shows that several studies review distance between the actual level and desired level of IT

knowledge among auditors.

McKee's study (2000), is probably the study first about the auditors' IT knowledge, he studied Norwegian auditing profession IT knowledge during the late 1998 and early 1999. Major findings from this survey include: Female respondents overall have IT knowledge lower than male respondents. 71% of the respondents believed they had received less than adequate coverage of information technologies in their college or university careers.17.3% of the respondents self-rated their overall knowledge of information technology as either low or very low. "Big 5" audit firm respondents self-rated their overall knowledge of information technology higher than did other respondents (statistically significant at 0.05 level) in 20 of the 25 technologies surveyed.

Lymr and Dbrsny (2003) discuss issues about the role of auditors in providing assurance on corporate reporting via the Internet. They find gaps between the use of IT and professionals answers, and conclude that: the real pronouncements made thus far by various bodies around the world fall considerably short as a response to the challenges that arise from current and future Internet reporting technologies.

Bierstaker and et al. (2003) found that the percentage of internal auditors surveyed in 2002 that use of various software was quite low, thus shows that these technologies are still very much emerging in the design and use. For example, for e-commerce privacy and integrity, only 12% of the internal auditors used software, for specialized fraud, only 19% used software, and for continuous transaction monitoring, only 18% used software. For organizations with revenues less than $ 250 M, none of the internal auditors used each of these types of software. They express the major reasons cited for not using such software was not cost, but that this software was not available. Cost was the second reason, however, the results indicate that if the software is available, they either are not aware of it, do not fully understand the benefits from a cost-benefit perspective, or the software simply has high price that can only be afforded by large organizations.

Brazel et al. (2004) reported that the electronic review of work papers rather than the traditional face to face meeting between preparer and reviewer may reduce auditors' feelings of accountability, and resulting in auditors performing their work less thoroughly.

Greenstein, Prosch and McKee (2004), developed McKee's (2000) study by investigating the appropriate level of information technology auditing professors and audit practitioners. Study indicated a relatively low level of knowledge for e-commerce and advanced technologies and audit automation by both educators and practitioners. The study, however, found a relatively high level of knowledge for office automation and accounting firm office automation constructs.

Hunton et al. (2004) conducted an experimental study to understand, assess and examine the extent to which financial auditors and IS audit specialists recognize differences in the nature and unique business and audit risks associated with ERP systems, as compared with traditional computerized (non-ERP) systems. The results suggested that financial auditors are significantly less concerned about ERP risks compared with IS audit specialists. Moreover, is audit specialists are less confident in financial auditors' abilities to recognize the unique risks posed by ERP systems, which could have harmful effects on audit quality.

Chen, Tseng and Chang (2005) showed that only half of the accounting firms in Taiwan used the Internet in business-related activities. They argue that if the firms do not use the Internet, while the firms' customers have transmitted their data through Internet to the firm, then

the auditors' ability to help customers in enhancing added value is questionable.

Chen's (2005) Study showed that accountants in Taiwan, on average, have skills work by computers and the professional accounting software. Despite these result, Chen argues that the ability of accountants in executive management roles, consulting and evaluation of information technology deployment is still an issue of great concern. These arguments raised the issue of the perceived value of various IT knowledge and skills by audit practitioners.

Janvrin et al. (2008) examine whether audit IT use and whether the IT importance depends on the firm size. A field-based questionnaire was used to collect data from 181 auditors representing Big 4, national, regional, and local firms. Their results show that auditors extensively use a variety of audit applications including analytical methods, audit report writing, electronic work papers, Internet search tools, and sampling. Auditors perceive different programs that were important (e.g., fraud review), but use them rarely. They also result in that use of IT specialists is infrequent, even by auditors who examine clients with complex IT. Finally, their findings indicate that IT is used in audit work and perceived importance vary by firm size.

Greenstein et al. (2008) performed a survey in Germany and the United States of America during the years 2000-2001. Their study showed a relatively low level of knowledge for the structure of e-commerce technologies, systems design and implementation and audit automation and the relatively high level of knowledge for the structures and General office automation for the German and the United States auditors. Knowledge of German auditors for e-commerce over the United states auditors find. While knowledge of United States auditors for systems design and implementation and audit automation technology over German auditors found. Importantly that, the study showed that over a quarter of respondents in both countries knowledge of their technology "less than adequate" are presented.

Noor Aziz and et al. (2009) performed a survey similar to the study of Greenstein, Porsch, (2000) Janvrin et al. (2004), Greenstein et al. (2008), but between auditors in Malaysia about the IT knowledge of auditors and IT importance in the context of certain Audit work. The results study is based on data collected from 95 audit firms via mailed questionnaires. In terms of knowledge, the results show the mean value for the self-perceived IT knowledge items ranges from 1.35 to 3.49, which is lower than the mean value range for their perception towards the importance of IT (2.01 to 3.84). So, IT knowledge among auditors is less of IT important.

Research Methodology

The statistical sample of this study was chosen among partners of audit firms, senior auditors, supervisors, and audit managers working in the audit firm member of the Iranian institutes of audit. The questionnaire was used to collect information about this research. 600 questionnaires were distributed randomly. After omitting the incomplete and incorrect questionnaires, the present research was accomplished by 84 credible and usable questionnaires. According to the do researches by the researchers in this filed, and study the newest issues of IFAC and AICPA and some e-commerce books, the questionnaire is consists of 30 information technologies. Before the real study to ensure the validity of the questionnaire, opinions and suggestions of the faculty members (teachers of accounting information systems) were considered in developing and reforming the final questionnaire used in this study (the questionnaire was in annex no.1). The reliability test in gathered data was accomplished by use of Cronbach's alpha, to investigate the internal consistency of the questionnaire on the basis of correlation average

between the items. By use of the Cronbach's alpha, the reliability test outcome in Table 1 shows that the questionnaire design is reliable and the gathered data is very reliable and consistent.

Table 1. Reliability Statistics for IT knowledge and Important

	Reliability Statistics for IT knowledge	Reliability Statistics for IT important
Cronbach's Alpha	0.96	0.926
Cronbach's Alpha Based on Standardized Items	0.96	0.925
N of Items	30	30

The Results

Demographic data on the audit practitioners included in this survey is presented in Table 1. This data indicates that respondents represented a wide variety of ages, experience levels, and position levels.

Table 2. Participant Demographics

		Frequency	Mean or Percent (Std. Dev.)
Age In Years			34.13
			(7.15)
Years as an External Auditor			10.36
			(7.28)
Current Position:	Senior auditor	43	51.2%
	Supervisor	18	21.4%
	Senior Supervisor	12	14.3%
	Manager	6	7.1%
	Partner	3	3.6%
	Missing	2	2.4%
Gender:	Male	80	95.2%
	Female	3	3.6%
	Missing	1	1.2%

University Degree:	Diplomat Associate	2	2.4%
	Bachelor of Art's	59	70.2%
	Master of Art's	21	25.0%
	Doctorate	1	1.2%
	Missing	1	1.2%

The result of Table 2 shows that the average age of the respondents is 34.13. Similarity the respondents were asked to show their auditing experience. The respondents' experience is ranged from 2 to 32 years with the average experience level of 10.36 years. The demographic data shows that the respondent auditors are completely experienced in their career, thus they are able to respond to the meaningful questions. The female respondents consist of %3.6 that shows a very low rate of working women in auditing work in Iran. The highest level of education for majority (%70.2) is bachelor's degree and %96.4 of respondents have bachelor's or higher university degree which shows that people with high education are employed in auditing work in Iran.

The results of importance and knowledge of information technology

30 technologies in Table 3 were analyzed for understanding the information technology skill in order to determine the number and index of basic substructures. To understand the information technology related to framework of audit in Iran, the first part of the questionnaire asked the respondents to define their knowledge according to 30 technologies in one of the criteria between 1-5 in which 1 means very low knowledge and 5 means specialized knowledge. Using five-point scale in which the middle point is 3, the percentage of respondents who are below the middle point shows that they have chosen point 1, 2 in the five-point scale. If the respondents' knowledge is below the middle point (3) we conclude that the typical group hasn't much knowledge about information technology. Then the questionnaire asked the respondents to define their understanding about the importance of these 30 technologies in the field of auditing work in one of the triple criteria 1, 3 and 5 in which 1= low, 3 = medium, and 5 = very important. The average response for every level of 30 technologies has shown in Table 3.

Table 3. Mean Ratings and Rankings of Importance and Knowledge of IT

Category/Technology	important				knowledge			
	N	Mean	Rank	Std. Dev.	N	Mean	Rank	Std. Dev.
General office automation:								
Word Processing	83	2.90	18	1.25	84	3.14	4	0.84
Electronic Spreadsheets	83	4.47	1	1.09	83	3.57	1	0.90
E-Mail	83	3	16	1.43	82	3.22	3	0.96

Internet Search & Retrieval	83	3.31	8	1.48	81	3.47	2	0.90
Image Processing	83	2.23	29	1.28	83	2.66	13	0.91
Electronic Presentations	84	2.14	30	1.29	82	2.66	13	0.89
Accounting firm office automation:								
Time Management & Billing Systems	83	3.29	9	1.50	84	2.68	11	0.96
Small Business Accounting Software	83	3.63	4	1.36	84	3.13	5	1.08
Tax Return Preparation Software	83	3.60	5	1.46	83	3.07	7	0.99
Audit Automation:								
Generalized Audit Software	81	3.81	3	1.48	81	2.99	8	0.97
Expert Systems	82	3.20	12	1.59	81	2.58	17	1.04
Electronic Working Papers	79	3.84	2	1.42	79	3.13	5	1.08
Embedded Audit Modules/ Real-time Audit Modules	78	3.05	15	1.48	80	2.30	25	1.01
E-Commerce Technologies:								
Encryption Software	81	2.73	20	1.44	81	2.43	21	1.05
Digital Communications	80	2.48	25	1.41	82	2.35	22	1.05
Firewall Software/Hardware	77	2.97	17	1.57	79	2.48	20	1.15
EDI-Traditional	84	3.38	7	1.44	83	2.80	9	1.06
EDI-Web Based	81	2.70	21	1.27	80	2.53	19	1.03
Wireless Communications	80	2.38	28	1.30	82	2.15	28	1.15
Intrusion Detection & Monitoring	80	2.85	19	1.52	82	2.33	24	1.09
Internal Network Configurations	80	2.53	24	1.43	82	2.09	30	1.08
External Network Configurations	80	2.45	26	1.59	82	2.13	29	1.10

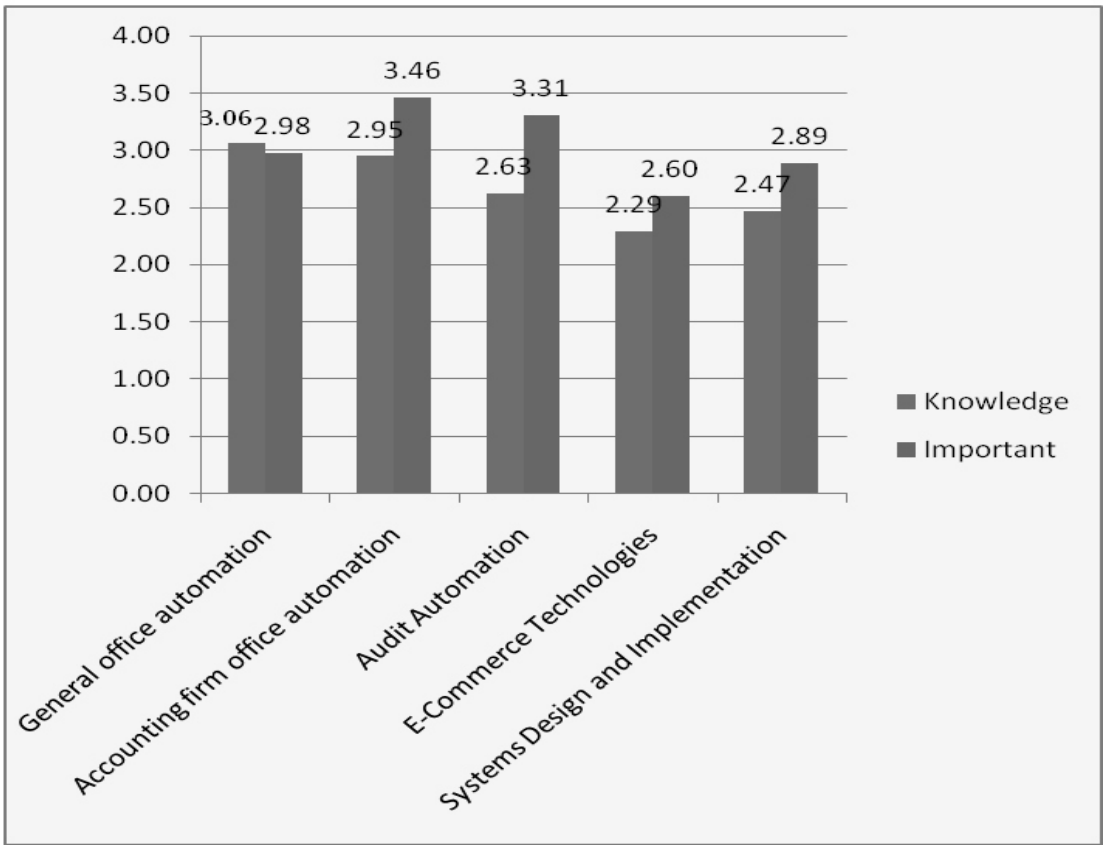
Systems Design and Implementation:								
Database Search & Retrieval	82	3.29	9	1.51	83	2.78	10	0.99
Simulation Software	79	2.59	23	1.61	82	2.20	27	0.92
Flowcharting/Data Modeling	81	3.10	14	1.48	82	2.67	12	1.01
Computer Aided Systems Engineering Tools	83	2.45	26	1.41	84	2.21	26	1.04
Cooperative Client/Server Environment	83	2.66	22	1.43	83	2.34	23	1.07
Workflow Technology	82	3.12	13	1.49	84	2.63	15	0.95
Database Design & Installation	83	3.22	11	1.43	84	2.58	17	1.08
Test Data	78	3.46	6	1.40	80	2.63	15	0.96
Valid N (listwise)	0				60			

The result of Table 3 shows that the average understanding of technology importance is between 2.14 and 4.47. In response to the first question in which it was asked what kind of IT is more important for the Iranian auditors, 16 technologies received mean value of 3.00 and more, so we can indicate that the framework of auditing work in Iran is interrelated and is more important for the auditors. These technologies included Electronic Spreadsheets, E-Mail, Internet Search & Retrieval, Time Management & Billing Systems, Small Business Accounting Software, Tax Return Preparation Software, Generalized Audit Software, Expert Systems, Electronic Working Papers, Embedded Audit Modules/ Real-time Audit Modules, EDI-Traditional, Database Search & Retrieval, Flowcharting/Data Modeling, Workflow Technology, Database Design & Installation, Test Data.

In terms of knowledge, the results in Table 3 shows that the mean value of IT knowledge is between 2.09 and 3.57, that is less than the mean value of IT importance (2.14-4.47). These shows the auditors observed that their IT knowledge is less than what is important in auditing work. In response to the second question about what kind of information technology the Iranian auditors use, only 7 technologies' mean values are averagely 3.00 or more, thus it is imagined that the auditors who answered were informed. These technologies included Word Processing, Electronic Spreadsheets, E-mail, Internet Search & Retrieval, Small Business Accounting Software, Tax Return Preparation Software, and Electronic Working Papers. Figure 1 in below summarized the mean value of every IT category. The general office automation received the highest mean value for the IT knowledge and the accounting firm office automation received the highest mean value for the IT importance, while the e-commerce information technology received the lowest mean value both for the importance and knowledge of information technology. The general interpretation is that the Iranian auditors only have enough IT only for one (general office automation) of the five constructs.

However, the alternate interpretation may be that knowledge of all individual information technologies isn't really necessary for professional judgment. Many auditors may not perform tasks which require all the specific IT knowledge surveyed. Most auditors may not perform the duties which require accomplish all surveyed specific IT knowledge. Also, they may lean on the experts in order to use different affairs of information technology.

Figure 1. Average Mean Value of Importance and Knowledge for Each Category of Technologies



Generally, on the basis of a five-point scale the respondents were asked to define their present knowledge of information technology and their understanding about the present function of information technology in Iran. The results show that the auditors understand the sufficient IT importance (mean value = 3.05), while the present knowledge of the auditors in order to audit the information systems is less than the sufficient amount (mean value = 2.68).

Conclusion

Although the IT has changed remarkably the auditing process, in Iran no research about usage of information technology and its importance in auditing work was accomplished. This study firstly prepares the important conception about the auditors' understanding toward the importance and knowledge of information technology in the specific framework of audit in Iran.

Two purposes expected in this study. The first purpose is identifying the interrelated technologies from viewpoint of the external auditors in Iran. From viewpoint of the respondent auditors 16 technologies are important, so it was considered that they are

interrelated in the specific framework of auditing work in Iran. It's interesting to pay attention that although the basic tool of information system's audit is generalized audit software, and the respondent auditors understand the importance of the generalized audit software in their auditing work (3.81), but in practice it is used less due to the auditors' knowledge which is about 2.99. The other 13 technologies were considered less important and therefore they are considered less relevant.

The second purpose is to identify the level of IT knowledge among the external auditors in Iran. The respondent auditors have good knowledge in 7 technologies and have little knowledge in 23 remaining technologies. The technologies that responding auditors are good at are in the category of general office automation, accounting firm office automation, and audit automation. Most auditors considered themselves as having poor knowledge of more complicated technologies specially technologies such e-commerce and system design and Installation. According to the less complicated information systems were accepted by Iranian companies, less demand for external auditors in order to gain knowledge may also define these findings. However, since most of these companies are moving toward digital transactions, unawareness of the auditors about audit automation and e-commerce technologies like coding software, identification of penetration and monitoring and the skills of embedded audit modules and real-time audit module may affect the audit reliability. Generally, the average skill in 4 structures is slightly worrying in Iran. As reported in figure1 and shown in table 2, sum of skills of Iranian auditors for these 4 structures include, e-commerce technologies, audit automation, system design & implementation, and accounting firm office automation located in the below part of the quintuple criteria. However, all skills for the structure of general office automation were seen in the upward, hence it seems that the Iranian auditors are free with the structure of general office automation. On average the Iranian auditors have relatively high knowledge level for 4 of 6 items of this structure (general office automation) which consists of word processing, Electronic Spreadsheets, E-mail, and Internet Search & Retrieval. However, in general, the group is free in this category, they are less free with picture processing and electronic presentation compared with other four items of this structure. The technologies general office automation structure are not really considered as an emerging technology, so achieving the average level of high knowledge for this structure made a logical validity for the overall results. It shows that the auditing profession in Iran needs to deal with this subject that profession must be appropriate for society needs. However, it's interesting to pay attention that low level of knowledge of develop technologies among the Iranian auditors correspond with people who investigated other studies, like Janvrin et al. (2008), Greenstein et al (2004), Noor Aziz et al (2008) Greenstein et al (2008).

The results of this study prepare important points for the standard regulators, researchers, and audit staffs concerning how the audit firms use of IT now. We hope that the results of this research will help not only the audit staffs but also will help the academics to focus on developing the requisite skills of IT in graduation time. According to the efforts of Iran government to accelerate the development of IT substructures, it's also expected that the Iranian companies, especially large companies, accept more advanced information systems. So, the members of the Iranian institute of certified accountants should establish the requisite standards for evaluating and controlling the conceptual and practical skills of IT when receiving a document of a certified accountant, and for working in audit profession.

Limitations

All studious researches have many limitations that may

be affect on usefulness and validity of the result. The general limitation of the present research is that since the questionnaire asked the respondents to define their knowledge, there is no way to identify whether their knowledge level accurately describes their actual knowledge or not.

Future the study

According to the obtained results it suggests that:

- As the requisite skills of information technology may change over time, the systematic study and documents of such changes are valuable.
- Comparison the combination of technology structure over time in order to understand the basic technologies can help to predict the future.
- The researchers can investigate in future what technologies the auditors use in each step of auditing work.
- The researchers can investigate in future how the auditing complicacy and decision making activities affect on the usage of applied programs of IT audit.

References

Abu-Musa, Ahmad A (2008), *Information technology and its implications for internal auditing*: An empirical study of Saudi organizations, Emerald Group Publishing Limited, 23 (5), 438-46.

AICPA (2002). Consideration of Fraud in Financial Statement Audit. *Statement of Auditing Standards* 99. New York, NY.

AICPA (2005). Audit Documentation. *Statement of Auditing Standards* 103. New York, NY: AICPA.

AICPA (2006). Risk Assessment Standards. *Statement of Auditing Standards* 104-11. New York, NY: AICPA.

American Institute of Certified Public Accountants (AICPA) (2001). *The Effect of Information Technology on the Auditor's Consideration of Internal Control in a Financial Statement Audit*. Statement of Auditing Standards 94. New York, NY.

American Institute of Certified Public Accountants (AICPA) (2007). *AICPA Professional Standards.* New York, NY.

Arnold, V., and Sutton, S. (1998). The theory of technology dominance: Understanding the impact of intelligent decision aids on decision maker's judgments. *Advances in Accounting Behavioral Research* 1: 175-194.

Banker, R. D., Chang H., and Kao, Y. (2002). Impact of information technology on public accounting firm productivity. *Journal of Information Systems* 16 (Fall): 209-222.

Bierstaker, J., Burnaby, P., Thibodeau, J. (2001). "The Impact of Information Technology on the Audit Process: An Assessment of the State of the Art and Implications for the Future," *Managerial Auditing Journal*, 16(2), 159-164.

Biertaker, J., Burnaby, P., Hass, S. (2003). "Recent Changes in Internal Auditors' Use of Technology", *Internal Auditing*, 18(4), 39-45.

Bonner, SE (1999). Judgment and decision making research in accounting, *Account. Horizon.* 13, 385-398.

Brazel, J. F., Agoglia, C. and Hatfield, R. C. (2004). Electronic versus face-to-face review: The effects of alternative forms of review on audit preparer performance and accountability perceptions. *The Accounting Review* (October), 949-966.

Chang, C. J., Hwang, N. R. (2003). "Accounting Education, Firm Training and Information Technology: A Research Note", Accounting Education, 12, 441-450.

Chen YF (2005). "Prepare for e-generation: The fundamental computer skills of accountants in Taiwan", *J. Am. Acad. Bus.* 7(1), 131-135.

Chen. M., Tseng, CY., Chang, J., (2005). "A survey investigation into the use of the Internet among accounting firms", *Int. J. Manage*. 22(4), 649-660.

DeEAngelo, L. (1981): "Auditor Size and Audit Quality,"

Journal of Accounting & Economics, 3(3), 183-200.

Fischer, M. J. (1996). "Real-izing" the benefits of new technologies as a source of audit evidence: An interpretive field study. *Accounting, Organizations and Society* 21 (February-April): 219-242.

Greenstein-Prosch M, McKee TE (2004). "Assurance practitioners' and educators' self perceived IT knowledge level: An empirical assessment", *Int. J. Account. Info. Syst.* 5, 213-243.

Greenstein-Prosch M, McKee TE, Quick R (2008). "A comparison of the information technology knowledge of United States and German auditors", *The International Journal of Digital Accounting Research,* 8(14), 45-79.

Hunton, J., Wright, A. and Wright, S. (2004), "Are financial auditors overconfident in their ability to assess risks associated with enterprise resource planning systems?", *Journal of Accounting Information Systems*, 18(2), 7-28.

IFAC, IAESB (2006): International Education Practice Statement (IEPS) 2.1, Information Technology for Professional Accountants. International Federation of Accountants (IFAC), *International Accounting Education Standards Board (IAESB).*

International Federation of Accountants (IFAC) (2001). *"Information technology in the accounting curriculum",* IFAC Education Committee Guideline 11, available at ww.ifac.org/store/Details.tmpl?SID=303859141967 (accessed 1March 2007).

International Standard on Auditing 401 (2002),*Auditing in Computer Information Systems Environment.*

Janvrin, D.; Bierstaker, J.; Lowe, D.J. (2008). "An Examination of Audit Information Technology Use and Perceived Importance", *Accounting Horizons*, 22(1), 1-21.

Liang, D., F. Lin, and S. Wu. 2001. Electronically auditing EDP systems with the support of emerging information technologies. *International Journal of Accounting Information Systems* 2 (June), 130-147.

Lymer A, Debrecency R (2003). "The auditor and corporate reporting on the Internet: Challenges and institutional responses", *Int. J. Audit.* 7, 103-120.

MCKEE, T. E. (2000): *Accounting/Auditing Technology in Norway: An Investigation of the Norwegian Accounting/Auditing Professions Knowledge and Views on Information Technologies*. Norwegian Institute of Public Accountants (DnR), Oslo, Norway.

N.Gleim, Irvin (2006). *IT application in internal controls. Translation* by: Aria, Naser; Forquandust, Kambiz(1385), First Edition, Tehran, publication audit organization, No.181.

Noor Azizi, Ismail; Azlan Zainol, Abidin (2009). Perception towards the importance and knowledge of information technology among auditors in Malaysia, *Journal of Accounting and Taxation* 1(4), 061-069.

Rezaee, Z. and Reinstein, A. (1998), "The impact of emerging information technology on auditing", *Managerial Auditing Journal*, 13(8), 465-71.

Salehi M, and Abdipour, A (2011). A Study of the Barriers of Implementation of Accounting Information System: Case of Listed Companies on Tehran Stock Exchange, *Journal of Economics and Behavioral Studies*, 2(2), 76-85.

Salehi M, and Husini, R (2011). A Study of the Effect of Information Technology on Internal Auditing: Some Iranian Evidence. *African Journal of Business and Management*, 5(15), 6169-6179.

Yang DC, Guan L (2004). "The evolution of IT auditing and internal control standards in financial statements audits", *Manage. Audit. J.* 19(4), 544-555.