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Identification and ranking of virtual audit executive impediments in Iran

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ABSTRACT

Despite of using virtual audit as timely financial and information reporting tool for beneficiaries, there have been no efforts to implement these programs in Iran and even executive impediments have not been obviated. In the present study we present first the concept of virtual audit and theoretical basics and review of the related literature. In the first stage of the present research we use Fuzzy Delphi technique to gain consensus of 12 audit experts of Iran who are selected by judicative method as the first stage's population. According to the results of the first stage, a questionnaire was provided that included 36 questions for recognition and ranking of virtual audit executive impediments in Iran and randomly was distributed among accountants of audit organizations and Yazd's and Mashhad's audit institutions as the second stage's population. The number of samples in this population was determined 185 via Cochran formula. In order to recognize the executive impediments of virtual audit in Iran, seven – fields of technologic, structural, legal, controlling, educational, expenditure and human source features are compiled in form of a questionnaire and are investigated as the given impediments. According to the results of the present study, after analyzing the questionnaire using statistical techniques such as Kolmogorov Smirnov test, Friedman test and Wilcoxon test, technology field impediments, among all seven effective fields on this type of audit, was recognized as the most important executive impediment of virtual audit in Iran in the view point of accountants.

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INTRODUCTION

Today's magnificent and increasing revolutions, which are the result of technology and Information technology development, affect the existing business methods. In information era, speed is considered as the most important possession, so in order to gain success we have to go along with today's new and up to date methods. Hence, creation of complicated, dynamic and evolved organizations needs changes in organizational processes and operations. Because audit process also was affected by information technology, the most important factor that affects decision making of all beneficiaries is the speed of investigation and presentation of results at the time of happening. Audit in virtual and distant methods, appropriately answers crucial needs of consumers of audit results. The concept of information technology audit (IT) was first introduced in middle of 60's. IT audit is an information technology based system aimed at contribution to accountants in programming, implementation, and control and audit mission navigation [1]. This type of audit is also known as virtual audit, online audit, desktop audit, continuous audit and remote audit and in all mentioned cases, some important and remarkable factors comes along with audit process such as no need for physical presence of auditor, speeding up information transition and decreasing the related expenses.

In determining the necessity of the present research we can claim that recognition and ranking of executive impediments of virtual audit in Iran is important because after recognizing the impediments, neutralization and implementation of virtual audit will become possible. As we mentioned earlier, in the present era, decreasing expenses and speed are among important factors for success and survival of every organization. Auditing through the common methods is expensive including the budget for travelling and settling the auditors. In virtual

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audit, due to the fact that no physical presence of auditor is needed, the expenses decrease significantly. In addition the expenditure of paper document filing and post prices will decrease. Rapid access to files and information and the possibility of connection of documents and evidences to audit reports through existing systems and soft wares, also continuous control of activities and detecting faults, simultaneous with happening, results in increase in the speed and accuracy of investigations which is one of the necessities of the world today. So the virtual audit is effective in developing the subjective of the organization and government in terms of different aspects specifically the required usage of state of the art technologies and increasing the speed and the accuracy and also decreasing expenses along with extension of organizations and virtual activities. According to above mentioned matters and increasing importance of virtual audit, unfortunately this case has not been focused seriously until now. So, it seems that an appropriate point to start the research in this field is presenting a pattern for recognition of virtual audit impediments in Iran. Because in our country we have no such an appropriate pattern, the purpose of the present study is to provide an efficient tool in order to recognize the executive impediments of virtual audit using expert auditors of Iran, Delphi Fuzzy method and analyzing the data of questionnaire resulted from the mentioned method. To do this, the items of the questionnaire are determined and analyzed as below. The main questions which the present study is seeking for are presented as below:

- What are the executive impediments of virtual audit in Iran?
- Which of the impediments is more important and has stronger effect on impeding the execution of virtual audit in Iran?

To answer the questions above, in addition to investigation and studying the related literature of virtual audit and its possible executive impediments, the initial questionnaire is provided and presented to the experts in order to obtain their opinions and selecting the most appropriate questions which fits the economic and financial environment of Iran. In the following sections, the method of obtaining the consensus of the experts, gaining a standard questionnaire and the results obtained from analysis of the questionnaire's data are described. In continue, in addition to presentation of background of the study in this field, the Delphi Fuzzy method is also determined and finally the methodology and analysis of the results will be presented.

Theoretical Background and Review of The Literature:

Today, auditing companies need to change the conventional techniques and methods in order to come along with situation and pertaining conditions and changes related to information technology. However, it is worth mentioning that in order to use new methods, the auditors should consider factors such as having the required skill, knowledge and experience in the field of information technology, time limits, completeness of information system of master and the information technology environment, efficiency and effectiveness of using information technology techniques against manual techniques and the levels of audit risks [2]. Information technology facilitates management of auditing documents, because this technology provides some facilities for the connection between different parts of a document and enables people to work simultaneously on a single document [3].

On the other hand, increasing the volume of processes, complicated transactions and electronic processes for doing transactions causes electronic documents to be replaced with paper documents. Hence, auditing methods have so many changes too. So it is so important for auditors to become acquainted with information technology due to these changes and their effects on accounting systems and electronic auditing processes without using paper documents, because information technology is the best tool using for promotion of the quality of auditing documents and efficiency of auditors [4]. In this regard, Titter and Waserheily [5] carried out a research titled as remote audit- increasing information and communication technology, and came into the result that as communication technology develops and forms the foundations of internal auditing, virtual audit causes most of organizations to survive longer and optimally use internal audit. On their point of view, as internal audit seeks to control expenses, improve quality and completely use inter-organizational commercial technologies, the role of virtual audit becomes stronger. Computer audit techniques enable auditors to evaluate the extracted data from complicated systems and make sure that the data and figure obtained from these systems are the real and accurate reflection of the given organization. But, because no physical presence of audit increases the prediction, it is necessary to embed the electronic communication between auditors and managers according to their values and beliefs in organization, because of the fact that lack of direct monitoring increases doubts in the auditor.

Chen et al [6] carried out a research about analysis of effective factors on evaluation of effective factors on online audit and resulted that information technology audit is the future of auditors and online audit is one of the most important grounds of research in relation to IT audit and doing researches to analysis its efficiency is important and helps us to plan a better executive program and prevent from non-scientific and traditional decisions in execution of online audit. In the opinion of Aless, Titter and Waserheily [7], remote audit provides internal auditors with an opportunity in order to technology penetration and adjustment with information environments and causes auditors to significantly revise the method of auditing and formation and management

of auditory team. In some cases, remote audit depends on re-engineering of work processes and it is possible to be the subject of complain by auditors who resist against change. Chen, Zhang and Giang [8], carried out a research titled as practicing a permanent audit in China and found out that permanent audit is a new auditing method in information environment. Information technology development enables permanent audit. In summary, execution of permanent audit results in increasing efficiency of audit, decreasing the prices, increasing the quality, expanding the audited domain, and standardizing auditing. Echorsy [9] in his research titled and the stages of business and the present opportunities for remote audit, described RA (Remote Audit) paradigm and experimental and main expected models and determined the major prerequisites of RA implementation. He came into the result that expanding cloud computing (using expanded networks such as internet) in general and commercial phases as BPAAS (Business process as a service) specifically cause the expansion of computer – based auditory techniques (RA and CAAT (Computer assisted audit techniques)) and the request for these kinds of audit in small and medium companies is increasing. So, so much efforts is made to introduce the economic value of RA to companies and auditors and to describe the control excess value and automatic navigation of system and also doing efforts for integration of economy science (thrust and audit) and computer science (auditory confirmed tools). Waserheily et al [10], in a research titled as acceptance of continuous audit by internal auditors came into the results that high volumes of information exists in current data systems but knowing real and accurate data will be crucial and effective for economic decision making. So the need to make sure of resulting data from continuous audit technologies (CA) and Continuous control monitoring CM is tangible more than before. So, the managers and internal audits in 9 American auditing organizations were interviewed and the situation of technology acceptance, expanding continuous audit and the amount of using continuous control monitoring were evaluated. They came into the results that several companies in the population of the study are involved in continuous control and audit and the others are going to accept the developed auditing technologies. But according to the presented audit model by these authors, none of the companies which are categorized in traditional and modern audit have ever reached to complete execution phase of continuous audit. Emotso et al [11] investigated the requirement of online continuous audit in England and came into the result that simultaneously with remarkable effects of online technology on economic activities and audit having a crucial role in financial reporting systems, the auditors gradually accepted to use online technology in their daily tasks. In this field, experimental researches was carried out in relation to the advantages and disadvantages of continuous online audit (COA) and the relation between them and the future of internal and external audit was evaluated. The findings implied that the preparedness of audit experts and their clients to accept COA is still a long and continuous discussion which is related to the reflections of COA's development. COA has obvious advantages which depends on the efficiency of the expert in order to use these advantages and control and decreasing the severity of existing losses which results in possible success and in other words accessibility of COA techniques. Considering the theoretical foundations mentioned earlier, in order to achieve the main subjects of the present research and answering its questions, some hypotheses are presented and examined as below:

H1: weakness of technology is an impediment for execution of virtual audit.

H2: structural problems are impediments for execution of virtual audit.

H3: weakness of the rules is an impediment for execution of virtual audit.

H4: control risk in an impediment for execution of virtual audit.

H5: lack of training is an impediment for execution of virtual audit.

H6: expenses are impediments for execution of virtual audit.

H7: human source features are impediments for execution of virtual audit.

Methodology:

The present research is functional in terms of purpose and descriptive – survey in terms of implementation. To achieve the objects of the research, the survey studies were done in two phases which are:

Providing a standard questionnaire:

In this research, in order to provide the standard questionnaire, according to the library studies and theoretical foundations, first we designed a questionnaire including 51 items in seven separate fields which are: technology, structure, law, control, training, expenses and human source. In providing this questionnaire and selecting the given questions we asked help from the results of the researches and sources in other countries. The questions are localized according to commercial and financial situations of Iran. Then it was presented to audit experts. In this phase, experts ranked every item in terms of its relation to the topic of the research in a three answer spectrum (high, medium, low). Each item which gains high rank from the consensus of experts after passing different stages of Delphi Fuzzy (the average of their ranks should be near triangle Fuzzy figures 5, 7, 9) will be used to provide the standard questionnaire. So the standard questionnaire of recognition of executive impediments of virtual audit in Iran including 36 items in common 5 degree Likert scale (from very low to very high) with ranking of 1 to 5, was designed in a way that figure 5 showed the lowest value and 1

showed the highest value. The executive impediments of virtual audit in Iran was identified and ranked using this questionnaire.

Identification and ranking the executive impediments of virtual audit in Iran:

In this phase, the required data are collected in order to analyze the hypotheses of the research and to answer the questions of the research through distributing the standardized questionnaire in phase 1 among statistical sample of the study. Categorization of the questions of the questionnaire is presented in table 1.

Table 1: Categorization of research questionnaire's items

Fields	Item no.	No of items
Technology field	1-5	5
Structure field	6-16	11
Legal field	17-18	3
Control field	19-22	4
Training field	23-28	6
Expense field	29-30	2
Human source features field	31-36	6
Total		36

Population, sampling method and size of samples:

Audit experts:

The given population was persons who in addition to academic degree in accounting had enough experience in auditing. The appropriate number for population is an important point that should be considered in panel formation. When the members of panel are homogeneous, about 10 to 20 members are advised [12]. So, 12 experts of auditing were selected by judicative method and had the role of confirmation of virtual audit questionnaire as the Delphi panel in the first phase of this research.

Auditors:

In order to determine the number of samples we used Cochran formula for unlimited society and number of 185 auditors was considered to answer the standard questionnaire.

Analytical techniques related to providing standard questionnaire:

As we mentioned in the methodology of the research, in this research we used Delphi Fuzzy method to provide the standard questionnaire for recognizing the executive impediments of virtual audit. So in this section we describe the Delphi Fuzzy method and algorithm of execution of this method and we present Fuzzy computations in continue.

Delphi Fuzzy method:

The objective of using Delphi method is to achieve the most reliable expert group content about a specific matter which is done using questionnaires and interviewing expert frequently and according to the feedback pertaining. Using Delphi Fuzzy method in order to make decision and agreements in matters in which the objectives and parameters are not clearly determined will cause so much valuable results. In the implementation of Delphi Fuzzy method, usually the experts present their opinions in forms of highest amount, the most possible amount and the lowest amount (triangle Fuzzy figures). Then the average opinion of experts (the presented figures) and the difference of every expert's opinion with calculated average are considered and these data will be sent to extract new opinions of experts. In the next stage every expert will present a new opinion according to the information gained through the previous stage or will modify him later opinion. This process will continue to the point that the average of Fuzzy numbers becomes static [13]. Because the expert should have selected the appropriate questions during Delphi process in order to identification and ranking the executive impediments of virtual auditing in Iran and in addition, using variables with absolute values would make troubles for commenting, we used qualitative variables in the framework of high, medium and low answers. So the qualitative variables are defined as triangle Fuzzy figures. The defined values for triangle Fuzzy figures for high were (5, 7,9) , for medium(3,5,7) and for low were (1,3,5).

Fuzzy computations:

In every stage of Delphi test, Fuzzy average for Fuzzy triangle figures $\tilde{A}_n, \dots, \tilde{A}_2, \tilde{A}_1$ are defined as:

$$\tilde{A}_m = \frac{\tilde{A}_1 + \tilde{A}_2 + \dots + \tilde{A}_n}{n}$$

In formula no.1, (a_i, A_i, b_i, c_i) the triangle Fuzzy figure is related to person i and \tilde{A} is the Fuzzy average related to each question [14].

After calculations of Fuzzy averages for questionnaire items, in every stage, for each expert we will calculate the difference from mean of population using below formula:

$$(A_1^m - A_1^i \cdot B_1^m - B_1^i \cdot C_1^m - C_1^i)$$

In the above formula, $A_1^m \cdot B_1^m \cdot C_1^m$ are low medium and high limits of triangle Fuzzy figures related to each item respectively and also $A_1^i \cdot B_1^i \cdot C_1^i$ are low, medium and high limits related to person i respectively. Then in the next stage, the average of population on the previous stage and the difference of each expert from mean of population are provided and again every person will answer the questions according to the related difference. Now again we calculate the Fuzzy average for the new phase and the mean difference of two phases. If the difference of means of two phases which is calculated using formula no 3 is lower than 0.15, the sufficient consensus is achieved accordingly. This phase will continue until sufficient consensus is achieved [15].

$$S(\tilde{N}_i \cdot \tilde{N}_j) = \frac{(a_1 + 2a_2 + a_3) - (b_1 + 2b_2 + b_3)}{4(B_2 - B_1)}$$

In the formula above, B_2 is the lowest and B_1 is the highest limit among the averages of two stages. Also $a_3 \cdot a_2 \cdot a_1$ are low, medium and high limits related to the mean of each question in the previous stage and $b_3 \cdot b_2 \cdot b_1$ also is low, medium and high limits related to the mean of new phase.

Analytical Techniques Related To The Hypotheses Examination:

Descriptive statistics:

The most important descriptive statistics are: frequency, percent of frequency, mean value, standard deviation and variance. In this study, the description of demographic data and ground variables include gender separation, education and participants are calculated and showed using descriptive statistics, frequency table and circle and column diagrams (appendix no 7).

Inferential statistics:

In the present study, we use Kolmogorov Smirnov test to examine the state of variables being normal.

Table 2: Kolmogorov Smirnov test to examine the state of variables being normal

Kolmogorov Smirnov test							
	Technology field	Structure field	Legal field	Control field	Training field	Expense field	Human source features' field
Number	185	185	185	185	185	185	185
Item z	2.644	1.494	3.196	2.276	1.437	2.702	1.754
Significance level (Sig)	.000	.023	.000	.000	.032	.000	.004

After the administration of Kolmogorov Smirnov test for all variables, according to significance level which is lower than 0.05 in the confidence level of 95% the assumption of variable to be normal is voided. So, all variable are abnormal. Hence according to the data which are abnormal, we use Wilcoxon test for one sample in order to examine the hypotheses and we use non-parametric Friedman test in order to categorize the variables. Finally we use softwares Minitab and SPSS in order to categorize and analyze the data.

RESULTS AND DISCUSSION

The results of the present study include two major sections. The results of the first section was selection of 36 (which were in the triangle figure limit of 9, 7, 5) questions among 51 suggested questions using Delphi Fuzzy technique during two phases. We used these questions in order to regulate the questionnaire of the study which was the basic of statistic tests of the second section. The average of the experts' opinions which are extracted from phases 1 and 2 and the difference of means in the experts' opinions in both phases are presented in appendixes 1 and 3. The second section includes the analysis of the research hypotheses. In this section, impeding or not impeding factors in execution of virtual audit in Iran was recognized and finally the existing impediments were ranked using statistic techniques and the mentioned softwares. So we can conclude that the purpose of the study which is recognition and ranking the executive impediments of virtual audit in Iran is realized and the questions of the research are answered. The questionnaires of the research are presented in the appendixes.

As we mentioned in previous sections, the importance of virtual audit and the necessity of executing is increasing according to the needs of the beneficiaries to accurate and on time information in order to make useful and economic decisions. Our country is not an exception, because in recent years information technology has affected artistically commerce and data management in business. The results of the audit in today's common techniques, although are useful, comes along with delay and sometimes errors. Using virtual audit which is programmed on the basis of technology, we can present an on time report with the lowest expenses and in addition we can prevent from the major amounts of errors in the process of auditing. Hence, according to the

importance of the matter, it seems that the topic of virtual audit needs special attention and more researches. The present research can be the start point. So we suggest researches to present approaches in order to obviate the executive impediments of virtual audit causing from the present research. Because, according to the results of the present study, the technology has the first rank in terms of impeding the execution of this kind of audit, it seems that one of the crucial approaches should be designing a comprehensive and effective software consistent with various types of activities in organizations. This will happen in a way that usage points are expanded and the expenses of designing different softwares decreases.

Conclusion:

According to the questions of the research, and Delphi Fuzzy technique, 7 factors were considered as the executive impediments of virtual audit. Also to answer the second question of the research (which impediment has higher importance and effectiveness on the execution of virtual audit in Iran), according to the results of tests, the factor of weakness of technology gained the highest rank and structural problems gained rank 7 which is presented in the table of appendix no 4. Furthermore, ranking all the questions as executive impediments of virtual audit in Iran is presented respectively in appendix no 5.

REFERENCES

- [1] Accorsi, R., 2011. Business process as a service : chances for remote Auditing, IEEE computer software and applications conference, IEEE.
- [2] Azar, A., H. Faraji, 2002. Fuzzy management science of research and production center of Iran, Ejtema press, no 169.
- [3] Chen, W., S. Liu, W.J. Smieliauskas and Trippeng., 2012. Influence factors analysis of online auditing performance assessment : a combined use between AHP and GIA, Emerald, 41.
- [4] Chen, W., J.-C. Zhang, Y.-Q. Jiang, 2007. One Continuous Auditing Practice in China : Data-oriented Online Auditing(DOOA).IFIP International Federation processing, Vol. 252, Integration and Innovation Orient to E-Society Volume 2, eds. Wang, W., (Boston:Springer), pp: 521-528.
- [5] Khajavi, H., 2010. Accounting journal- official accountant, 9: 69-73.
- [6] Mahdavi pour, A. and M. Ghafari, 2010. accounting journal- official accountant., 9: 75-79.
- [7] Heydari, K. and J. Mohammadi, 2012. the role of electronic monitoring base in financial regularization of governmental systems. Auditing journal, 63: 1-7.
- [8] Mashayekhi, A., A. Farhangi, M. Momeni, S. Alidousti, 2005. Investigating the key factors affecting the function of information technology in governmental organizations of Iran: the function of Delphi method.
- [9] Omoteso, k., A. Patel and P. Acot, 2008. An investigation into the Application of Continuous Online Auditing in the U.K., the international journal of Digital Accounting Research, 8(14): 23-44.
- [10] Rahimian, N., 2009. Accounting journal- accountant., 131: 34-37.
- [11] Teeter, R.A., M.A. Vasarhelyi, 2010. Remote Audit : A Review of Audit Enhancing Information and Communication Technology literature , Journal of emerging technologies in accounting.
- [12] Teeter, R.A., M.G. Alles and M.A. Vasarhelyi, 2010. Remote audit : A research framework, Journal of emerging technologies in accounting
- [13] Vasarhelyi, M.A., M. Alles and J. Littley, 2012. The acceptance and adoption of continuous auditing by internal auditors: A micro analysis, International journal of accounting information system, 13: 267-281.
- [14] Yaghoob nejad, A., H. Nikoo maram, M. Moein al din, 2011. presenting a pattern in order to measure financial literacy of Iran's students using Delphi Fuzzy method. Financial engineering journal and management of securities., 8: 1-24.
- [15] Zanjeer chi, M., 2011. The process of Fuzzy hierarchical analysis , Sanei Shahmirzadi press, 66.

APPENDIX 1

Table 1: The mean of the experts' opinions from the questionnaire of phase1

Mean	Q	Mean	Q
4.5,6.5,8.5	27	4.67,6.67,8.67	1
4.33,6.33,8.33	28	4.67,6.67,8.67	2
2.33,4.33,6.33	29	3,5,7	3
4.33,6.33,8.33	30	3,5,7	4
4.33,6.33,8.33	31	4.17,6.17,8.17	5
4,6,8	32	4.83,4.83,4.83	6
4.67,6.67,8.67	33	4.67,6.67,8.67	7
4.67,6.67,8.67	34	3.5,5.5,7.5	8
4.67,6.67,8.67	35	4.67,6.67,8.67	9
4.5,6.5,8.5	36	4.5,6.5,8.5	10
4.33,6.33,8.33	37	4.67,6.67,8.67	11

3.5,5.5,7.5	38	4.5,4.5,4.5	12
4.33,6.33,8.33	39	3.33,5.33,7.33	13
3.5,7	40	4.33,6.33,8.33	14
2,4,6	41	3.66,5.66,7.66	15
3.5,7	42	3.66,5.66,7.66	16
3.5,7	43	4.5,6.5,8.5	17
4.5,6.5,8.5	44	4.67,6.67,8.67	18
4.33,6.33,8.33	45	4.67,6.67,8.67	19
4.33,6.33,8.33	46	4.17,6.17,8.17	20
5,7,9	47	5,7,9	21
2,4,6	48	4.33,6.33,8.33	22
4.33,6.33,8.33	49	4.5,6.5,8.5	23
4.5,6.5,8.5	50	4.5,6.5,8.5	24
5,7,9	51	3.5,5.5,7.5	25
		3.66,5.66,7.66	26

APPENDIX 2

Table 2: The mean of the experts' opinions from the questionnaire of phase 2

Mean	Q	Mean	Q
4.83,6.83,8.83	27	5,7,9	1
4.5,6.5,8.5	28	5,7,9	2
2.33,4.33,6.33	29	3.5,5.5,7.5	3
4.83,6.83,8.83	30	3.5,5.5,7.5	4
4.83,6.83,8.83	31	4.67,6.67,8.67	5
4.5,6.5,8.5	32	4.83,6.83,8.83	6
4.83,6.83,8.83	33	5,7,9	7
5,7,9	34	3.5,5.5,7.5	8
5,7,9	35	5,7,9	9
4.83,6.83,8.83	36	4.83,6.83,8.83	10
4.5,6.5,8.5	37	4.83,6.83,8.83	11
3.66,5.66,7.66	38	4.5,6.5,8.5	12
4.67,6.67,8.67	39	3,5,7	13
3,5,7	40	4.5,6.5,8.5	14
2.33,4.33,6.33	41	3.5,5.5,7.5	15
3.5,5.5,7.5	42	3.66,5.66,7.66	16
3.66,5.66,7.66	43	4.83,6.83,8.83	17
4.5,6.5,8.5	44	5,7,9	18
4.83,6.83,8.83	45	4.67,6.67,8.67	19
4.67,6.67,8.67	46	4.67,6.67,8.67	20
5,7,9	47	5,7,9	21
2.33,4.33,6.33	48	4.67,6.67,8.67	22
4.67,6.67,8.67	49	4.5,6.5,8.5	23
4.5,6.5,8.5	50	4.83,6.83,8.83	24
5,7,9	51	3.5,5.5,7.5	25
		3.5,5.5,7.5	26

APPENDIX 3

Table 3: The difference of mean of the experts' opinions in phase 1 and 2

Mean	Q	Mean	Q
0/07	27	./07	1
0/07	28	./07	2
0	29	./11	3
0/11	30	./11	4
0/11	31	./11	5
0/11	32	0	6
0/03	33	./07	7
0/07	34	0	8
0/07	35	./07	9
0/07	36	./07	10
0/07	37	./03	11
0/04	38	0	12
0/07	39	./08	13
0	40	./07	14
0/07	41	./04	15
0/11	42	0	16
0/04	43	./07	17
0	44	./07	18
0/11	45	0	19
0/07	46	./11	20

0	47	0	21
0/07	48	./07	22
0/07	49	0	23
0	50	./07	24
0	51	0	25
		./04	26

APPENDIX 4

Table 4: The result of ranking test of Friedman for the fields of executive impediments of virtual audit in Iran

Variable	Mean of rank	The situation of fields comparing to each other	
Technology field	5.17	1st	
Legal field	4.49	2nd	
Control field	4.20	3rd	
Human source features field	4.02	4th	
Expenses field	3.52	5th	
Training field	3.50	6th	
Structural factors field	3.10	7th	
The indices of Friedman ranking test			
No	Chi square item	Degree of freedom	Sig
185	121.746	6	0.000

APPENDIX 5

Ranking of the questions as the executive impediments of virtual audit

Questions	Rank
Q 11- non-electronic documents	1
Q 17- no appropriate rule for implementing and execution of virtual audit	2
Q 3- no possibility to electronically communicate between auditor and related organizations in some areas of the country	3
Q36- lack of experts and professionals in organizations in information technology field	4
Q4- low internet speed	5
Q1- inefficiency of the softwares, hardwares and pertaining networks in most of organizations	6
Q35- no interest of experienced persons for getting acquainted with sciences and computer techniques and state of the art technologies.	7
Q 19- inefficiency of security and function of application systems for preventing from manipulation	8
Q26- no enough training for employees in the institution under the study in virtual audit field	9
Q31- fear of changing the common processes	10
Q28- no enough knowledge of English language	11
Q14- no appropriate organizational culture for embedding trust in electronic communication	12
Q20- inefficiency in security and function of application of systems in order to prevent from unauthorized access to data and programs	13
Q 12- impossibility for direct observation of organization activity processes (internal control)	14
Q5- impossibility of conformation of electronic data with documents and sources	15
Q22- impossibility of controlling auditor in order to prevent from replacing data in virtual system	16
Q24- no training for human force in order to embed trust in electronic communication.	17
Q29- high expenses of permanent updating programs and softwares	18
Q2- no system administration without paper in some organizations	19
Q6- impossibility of direct observation of documents	20
Q21- impossibility of accurate control of auditor on the organization's activities	21
Q25- No enough training in the field of virtual auditing for auditors' activities	22
Q7- impossibility of effective communication between auditor and boss	23
Q34- creating communication gaps such as no effects on the part of voice tone or behavioral status of auditor on audited due to no physical presence of the auditor	24
Q23- no training courses along with software extension	25
Q16- no effective control foundation in order to prevent from using old functional and disintegrated softwares	26
Q30- high cost of holding training sessions along with software expansion	27
Q27- no training for authorities in relation to administration of system without paper	28
Q33- fear of using technology	29
Q15- no culturing on the basis of trust in long term and temporary status	30
Q8- increasing guesses and predictions due to no physical presence of auditor	31
Q10- impossibility of direct monitoring of employees' functions	32
Q18- lake of united rules for denomination and categorization of files	33
Q9- not providing and setting network security softwares in most of organizations	34
Q32- resistance against re-engineering of business processes	35
Q13- elongation of auditing process due to no focus and distance from audited organization	36