TURKISH AUDITING PROFESSION IN THE DIGITAL ERA: FROM AUDIT 1.0 TO AUDIT 4.0[*]

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ABSTRACT

The purpose of this paper is to explore how technological improvements have affected and will have impact on auditing professions. A qualitative approach has been used to answer the research questions. This is a case study that the empirical data has been collected through semi-structured interviews. The interviews have been applied to six auditors who are in charge of six different audit firms. The findings have shown that in the last five years, audited firms have experienced digitalization in the accounting field such as e-book and e-tax return applications came into effect. In the view of auditors, the skills needed to be a complete auditor will dramatically change in the near future. Additionally, due to growing importance of IT knowledge, universities have a great responsibility to adapt their curriculum according to new technologies.

Keywords: Turkish Audit Sector, Audit Profession, Audit 4.0, Continuous Audit, Digital

JEL Classification: M41, M42

DİJİTAL ÇAĞDA TÜRK DENETİM MESLEĞİ: DENETİM 1.0'DAN DENETİM 4.0'A

ÖZ

Bu çalışmanın amacı, teknolojik gelişmelerin denetim mesleklerini nasıl etkilediğini ve nasıl etkileyeceğini araştırmaktır. Araştırma sorularını cevaplamak için nitel bir yaklaşım kullanılmıştır. Bu çalışma, ampirik verilerin yarı yapılandırılmış görüşmeler yolu ile toplandığı bir durum incelemesidir. Görüşmeler, altı farklı denetim firmasından yetkili altı denetçiye uygulanmıştır. Bulgular, son beş yılda denetlenen firmaların muhasebe alanında e-defter ve e-vergi beyannamesi uygulamalarının yürürlüğe girmesi gibi dijitalleşmeye maruz kaldıklarını

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göstermektedir. Denetçilerin bakış açısına göre, tam bir denetçi olmak için gereken beceriler yakın gelecekte önemli ölçüde değişecektir. Buna ek olarak, BT bilgisinin artan öneminden ötürü, üniversiteler müfredatlarını yeni teknolojilere göre uyarlamada büyük bir sorumluluğa sahiptir.

Anahtar Kelimeler: Türk Denetim Sektörü, Denetim Mesleği, Denetim 4.0, Sürekli Denetim, Dijital

JEL Sınıflandırması: M41, M42

1. INTRODUCTION

New kinds of technology such as artificial intelligence, cloud, big data analytics, mobile devices have been changing auditing practices (Munoko et al 2020). It is projected that 30 % of corporate audits are being conducted by Artificial Intelligence (AI) by 2025 (World Economic Forum 2015, 7). Auditors have to improve their IT usage skills for being adapted to the new auditing environment.

In this paper, it is tried to respond to how the technology has been impacting on auditing professions. In order to identify this effect, semi-structured interviews are applied to a group of auditors to examine these technologies are changing the practice of auditing.

This paper is organized as follows. The methodology section introduces the research model of the paper. The literature review section summarizes the literature of related studies. The case study section reports the responses of auditors and analysis them. The conclusion section concludes the paper and offers suggestions for future research.

2. METHODOLOGY

This paper follows a qualitative approach by using the case study method. A qualitative approach depends on the contextual interpretation of empirical data. Researchers can analyze the social behavior and opinions of participants. However, results depend on the subjective analysis of researchers. Embodying the unstructured and unstandardized process, the approach is difficult and restricted.

In this paper, the semi-structured interviews are applied the auditors who are located in Ankara. Ethics committee approval of the semi-structured interviews was obtained from Ankara Hacı Bayram Veli University Ethics Committee with the decision of the meeting 05, dated 08.06.2020 and numbered 11054618-302.08.01. Each interview lasts forty minutes.

In interviews, four main questions asked:

Q1- How have technological advancements affected the auditing profession over the last five years?

Q2- What is IT knowledge level of auditors?

Q3- Do you believe that rule setters need to make changes in adapting digitalization?

Q4 –What types of changes, will be seen in terms of IT in auditing 291ort he next five years?

Interviews only include open-ended questions in which auditors have choice of free words. The interviews have not recorded, only responses have taken notes. Responses have sent to auditors by email, and asked for reviewing explanations. The name of auditors and their firms never have recorded.

3. LITERATURE REVIEW

Dai and Vasarhelyi (2016) classify auditing into four generations in terms of types of tools used in the auditing process. Tools are closely related to the technology of the current era. While calculators were a main tool in the first generation, intelligent systems are the latest ones in the latest generation it is called Audit 4.0. The development level of a country's technology also determines in which generation its auditing process is located. As the latest generation, Audit 4.0 uses a similar infrastructure of Industry 4.0 business management process (Dai and Vasarhelyi 2016).

Technology is an important factor in helping auditors collect and analyze data. The modern business environment generates big data. Alles (2015) mentions that the audit profession cannot neglect big data analytic, because firms gradually have begun to use it to make strategic decisions. As an auditor, an unsuccessful analysis of large amounts of undocumented information leads to sub-optimal auditing judgments (Brown-Liburd et al. 2015, 455).

New advanced technology requires a new set of skills. The business world is going forward to a highly automated, highly flexible and highly interconnected environment, with real-time capabilities of fault detection, prediction, and decision-making (Dai and Vasarhelyi 2016, 8). Audit firms should invest in technology to protect audit quality. For example, the Big 4 have been making significant investments in AI for both advisory and assurance practice (Brown-Liburd et al 2015). Interview accounting firms by Omoteso et al (2010) showed that technology is indeed reshaping the role of auditors. They determined that continuous auditing and AI would gain more prominence within the audit profession.

The reflections of industrial revolutions on auditing field, the process of transition from Audit 1.0 to Audit 4.0, the impact on the auditing profession and auditors are the subjects of this paper. Demirkol and İkvan (2020) have tried to design Audit 4.0 model that includes new generation applications and tools that are components of Industry 4.0 such as smart factories, cyber physical systems and RFID in order to determine the possible effects of Industry 4.0 on auditing activities. Ertan and Engin (2018), on the other hand, have tried to create an Audit 4.0 system with the Digital Twin method, which is formed by the combination of new generation tools such as sensors, artificial intelligence and augmented reality.

Yıldız and Ağdeniz (2019) have defined Audit 4.0 as a real-time and assuring auditing that uses financial and non-financial internal and external big data obtained with IoT as input and analyzes it with artificial intelligence technologies beyond continuous auditing. It is envisaged that the auditors will be an expert data analyst (Demirkol and Ikvan 2020) and risk manager (Yıldız and Ağdeniz 2019). It is emphasized that traditional auditor features cannot keep up with these developments, so they should constantly innovate themselves in accordance with digital developments. To achieve this, audit firms should provide professional and digital training for their employees. It is recommended to create an auditor profile that will be required in the Audit 4.0 process and to prepare recruitment and training in accordance with this new structure (Erturan and Ergin 2018). In addition, auditing standards should be revised in line with these innovations in order to implement information technologies.

4. CASE STUDY RESULTS

This research using the semi-structured interview is a qualitative study. The six auditors located in Ankara participate in the research. As there is no specific method of the calculation sample size in qualitative studies (Yildirim and Simsek 1997, Dworking 2012), 6 participants are considered sufficient.

Auditors have different tenure from 7 years to 28 years. Except for two auditors, others work in an auditing firm that is a member of the international auditing network. Five auditors are authorized to audit publicly traded firms, one has not.

The following Table 1 is a summary of the auditors' features such as sex, tenure, scope of membership and authorization.

Table 1. Demographic Characters of Auditors

	Gender	Tenure (Year)	Membership	Authorization
Auditor 1	M	20	I	Ultd
Auditor 2	M	24	I	Ultd
Auditor 3	M	16	I	Ultd
Auditor 4	M	28	N	Ultd
Auditor 5	M	12	N	Ultd
Auditor 6	F	7	N	Ltd
Abbreviations: M/F: Male, Female; I/N: International/National; Ultd/Ltd: Unlimited/Limited				

The auditors have been chosen to get opinions from different perceptive. They have different skills and experiences. The average experience of auditors is 18 years. The longest and shortest experience are 24 years and 7 years, respectively. The half of companies the auditor work are a member of an

international auditing and accounting network; the rest is not. Five auditors have an authority to audit trade and nontrade firms, while one auditor can only audit nontrade firms.

Responses of four main questions are reported below:

Q1: How have technological advancements affected the auditing profession over the last five years?

As the first question, the auditors were asked about the technological developments in the field of audit in the last five years. They highlighted two main points.

Firstly, the auditors all cited the digitalization of the firms they audited as one of the most important developments. E-books and e-file tax returns applications were shown as the most important developments. According to the Turkish tax legislation, large firms are required to keep electronic books according to their assets and income levels. According to auditors, this requirement made firms more transparent and more organized.

Auditor 1 stated that companies' accounting programs became web-based, data flow became very easy and analytical data was generated. Auditor 2 and Auditor 3 explained that it is now very easy to obtain information from companies, that all data of companies is taken in a short time and that the need for on-site auditing has decreased.

From the points of auditors, they began to download all information on firms and upload their systems easily. Because all information is ready on their hand, the necessity of onsite auditing decreased.

Auditing software programs were noted as the second major development. All auditors stated that auditing was conducted on an Excel-based method two or three years ago whereas they had switched to a general purpose auditing program. Auditor 4, Auditor 3 and Auditor 1 explained that they had switched to the new program but were still using Excel-based programs. Auditor 1 said that there were many programs developed by themselves and that they could not leave these programs at once.

Auditors were asked the questions about the reasons for switching to auditing programs and the benefits of using audit programs. They explained that the program increases the effectiveness and efficiency of the auditing. Auditor 1 stated that the auditing emerged as a process, that the staff had a chance to see the general overview, and that continuity could be achieved in the follow-up of the process. Auditor 2, Auditor 4 and Auditor 3 stated that various analyses were carried out automatically when data was transferred into the auditing program. Auditor 6 also stated that the difficulty of preparing the auditing file was eliminated, the file was prepared digitally, and the document mess was eliminated.

Q2: What is IT knowledge level of auditors?

For an auditing of the age, one of the most important features that auditors should have is IT competence (Alles 2015, 448). In this section, IT competence of auditing companies and their employees will be revealed.

Auditors think information technology knowledge is not enough. Nor they also believe that the information technology structure of audit firms is strong. They also noted that their company did not have a trained staff in terms of IT. According to auditors, the education system did not support knowledge of IT. They gained some skills in their effort. It is seen that the knowledge level of them closely related to their interest.

Auditor 1 explained his opinions by noting: "We do not have a corporate structure; in other words, we do not have an IT department. The level of knowledge of our employees is very limited in this regard. This is not only our problem, only 5-6 companies in Turkey have IT staff, 4 out of 5 of them receive services by outsourcing."

Dai and Vasarhelyi (2016) categorize the auditing into several generations. The authors claim that digital technologies have brought auditing to a new stage called Audit 4.0. These stages presented to the auditors in Table 2 were explained and the question of the stage of the audit in our country was asked.

Table 2. Generations of the Audit

The Generation of the Audit			
Audit 1.0	**Audit 2.0**	**Audit 3.0**	**Audit 4.0**
Manual audit	IT audit	Inclusion of Big Data in audit analytics	Semi- and progressive automation of audit
Tools: pencils, calculators	**Tools:** Excel, CAAT software	**Tool:** analytic apps	**Tools:** sensors, CPS, IoT/IoS, RFID, GPS

Source: Dai and Vasarhelyi 2016, 2.

Auditors believe that the audit profession in Turkey is behind developing countries' profession. As they experience the generation of Audit 3.0, Turkey still lives in the generation of Audit 2.0. In Turkey, Excel and GPAP are used heavily in the auditing process. Although most evidence is digital, auditors collect physical evidence. Digital documents firstly are being printed out and then are physically being audited and filed by auditors.

Auditor 5 has stated that the data is now digital, and that auditing should also be digital and that the need for IT personnel is increasing and that IT information is required even for looking at the accounting books. Auditor 1 evaluated the incident from another point of view and stated that there was no company in Turkey whose infrastructure was in line with 3.0. Therefore, he explained that the audit companies did not make a suitable infrastructure investment. Auditor 2 said that there are only six audit companies

in Turkey that have been authorized to audit IT. Therefore, it is difficult to say that the sector is in the stage of Audit 2.0.

There should also be a link between the audit generations shown in Table 2 and the level of knowledge of employees. In this respect, the participants were asked what level of information they expected from their employees to contribute to digital audit. All auditors have said that Excel knowledge is very important and that employees are required to use Excel effectively. Auditor 1, Auditor 2 and Auditor 3 said that they had difficulty in finding qualified staff and that being able to use Office programs became the main criteria during the recruitment phase. Auditor 1 and Auditor 5 stated that the staff was in need of the ability to write Excel-based programs in the following stages.

Auditor firms often recruit staff from business schools. Schools' curriculum is behind the need for the audit profession. In business schools, adoption of new technology and application of IT in the learning process are not sufficient to enhance education environments and blackboard and chalk remain the primary teaching technologies (Leidner and Jarvenpa 1995, 265). Even Microsoft Office knowledge can not be taught in this type of school. After recruitment, auditing firms undertake huge costs to give some skills to new staff. Because of education needs, recruited staff can not serve effectively in a short time. Excel knowledge of the staff is still been seen as a major skill for auditors in Turkey. Programming macros in Excel especially are accepted as a high IT knowledge among auditors.

The auditors also stressed that the education at schools for auditors is quite inadequate. Auditor 1 and Auditor 2 noted that the auditors graduated from departments such as Business Administration and Economics and that the education given was not suitable for the digital world. Auditor 2 has stated that it is mandatory for universities to revise their education programs that IT knowledge should be presented to universities. Auditor 4 stated that business education should now be enriched with IT education.

Auditor 1 and Auditor 5 noted that they paid attention to IT knowledge while recruiting personnel. However, due to the lack of business and economics graduates, they preferred graduates from the fields such as Statistics, Econometrics and even Physics.

In the study of Kostic and Tang (2017), they have revealed that the IT ability and knowledge of auditors depend heavily on their personal interest and previous training regarding the auditing business. According to the study, it has been seen that people, except for those who are IT experts, categorize themselves according to the level of Excel knowledge. Moreover, being able to write macro in an Excel file is seen as an advanced IT level.

Auditors must be well-equipped and develop knowledge and skills according to the developments in information technology in order to ensure public confidence and to perform high-quality audits (Türker 2018,204).

Q3: Do you believe that rule setters need to make changes in adapting digitalization?

Auditors have been asked whether standard setters like CMB and KGK should make arrangements to keep up with the digital world.

Auditors mention that standard setters should amend auditing standards; they should adopt standards with the digital world. Current standards only cover few rules about digital auditing, for example, electronic evidence is vital and audit files can be kept electronically. This regulation is not enough for today's business environment. Standards should regulate digital auditing.

Participants would like regulatory bodies to give some special authority to verify some information, such as property ownership, bank balance. Online confirmation increases the effectiveness of confirmation. Not only cost and time consumption dramatically does not drop but also the reliability of evidence increase.

Noting that KGK has collected XBRL-based digital data whereas it has not announce them, Auditor 1 stressed that there should be an exchange of information among auditors in order to ease the analysis of industry and company. He has also emphasized that a major step will be taken in the direction of big data in our country.

Auditor 2, Auditor 3, Auditor 5 and Auditor 6 stated that there should be more provisions in the auditing standards regarding digital auditing there should be changes accordingly.

Auditor 1, Auditor 2 and Auditor 5 have not highlighted that the processes of digital auditing should be defined.

Auditor 5 stated that he had analyzed all the standards and that there were no provisions in the audit standards except for provisions that electronic data were evidence and that documents could be created electronically.

Auditor 5 explained that "In standards, there is no answer to the question of how to audit through an integrated digital system." He stated that the provisions on how to carry out digital auditing systematically should be included in the standards after revising them.

According to the standards, all kinds of documents and information are evidence. Providing the evidence either physical or electronic will not change the case. Auditor 5 has noted that the evidence in electronic media is not a replica of the original, and that these are the original ones. Therefore, there is a need to control the original copy. Auditor 1 and Auditor 5 explained that the validity and having the electronic evidence should be checked and standards should be regulated accordingly.

Auditor 1 and Auditor 2 emphasized the need to take steps in terms of finding the information at its own source. The auditors stated that the data should be verified from other external sources not from the

company being the source of the information. Therefore, the regulatory authorities should provide permission to auditing companies in order to access the data online. According to the auditors, arrangements should be made for the company's information to be queried online from third parties such as Land Registry, Bank and etc.

Q4: What types of changes in terms of information technology will be seen in auditing for the next five years?

Auditors were asked about the impact of technological innovations such as Big Data and Bitcoin on the profession.

The auditors all said that the profession has to undergo a radical change. According to the auditors, the qualifications of an accountant and auditor will be different. Auditor 3 states that the auditing profession will face the danger of being no longer in demand and Auditor 1 says that a decrease in employment can be expected. On the other hand, others state that the profession will always exist, but the employment structure will change. As a change in the employment structure, they express that the accountant and the auditor will become individuals with high IT capabilities. It is believed that the final decision-maker will always be the person himself, especially in auditing (Auditor 1 and Auditor 5). However, it is expected that the document verification process will change completely, and the physical controls will decrease (Auditor 5). In addition, it is believed that program evaluation and testing will become the main task of auditors (Auditor 2, Auditor 3, Auditor 5). Auditor 1 stated that he believed that the time-consuming and continuous repetitive tasks of auditors would be reduced and replaced by more tasks such as risk assessment and analysis.

The findings were found to be in line with the literature. In their study on auditors, Kostic and Tang (2017) determined that auditors believe that their time-consuming and manual tasks will decrease. In the same study, it has been determined that auditors will focus on examining extraordinary events, strengthening customer relations and activities that create value for the customer and the firm in the future.

Another expectation for the upcoming period is that the real-time auditing process will begin. In classical auditing understanding, following the contract, the auditing activity is planned, and opinions are formed as a result of the audit activity carried out. In the auditing process, collecting, processing and reporting the data take time. Therefore, the reports reach the relevant persons with delay. The time difference decreases the value of information. Most auditors state that real-time auditing is a requirement. Auditor 5 said, “If we want to increase the value of the auditing, we need to report faster without reducing the quality of the auditing and the classical understanding of the audit should be changed”. According to the auditors, it is required to have an infrastructure that can move to continuous supervision.

According to Auditor 2 and Auditor 5, there is a need for software that can instantly identify errors and risky events. The auditor should be directed to the events presented by these software.

Auditor 2 came up with a more interesting idea, stating that by switching to continuous auditing, reporting faster and changing the type of assurance could be done. According to Auditor 2, a way is also possible to give a fast but low-assurance auditing opinion, and then to give a higher-security opinion. Thus, information can be delivered to the users of the financial statements immediately without any delay in compliance with our age.

5. CONCLUSION

This qualitative research was conducted by a six-auditor interview. Four main questions were asked to auditors. Questions are related to a) technological improvements that impacted auditors, b) auditors level of IT knowledge c) steps that should be taken rule setter and d) future perceptions of auditors.

According to the empirical study covering the results of interviews, the following results were obtained.

- Audited firms got digital, as they began to use web-based accounting programs, auditors can reach financial information easier.
- Auditors believe that their knowledge of IT is not sufficient.
- Using GPAP is big and important step to forward to digitalization. It helps auditor to conduct auditing services more effectively.
- The audit profession in Turkey is behind developing countries' profession. As they experience the generation of Audit 3.0, Turkey still lives in the generation of Audit 2.0.
- The education in the departments such as Business Administration and Economics is far behind the digital world. The curriculum in the departments should be revised and the graduates should have basic IT knowledge.
- Auditing standards should be reconsidered and provisions on how to conduct digital auditing should be included in the standards.
- The authorization of auditors should be increased and the possibility of online questioning of company information from third parties should be introduced. In this context, opportunities such as checking the land registry records and bank balances should be enabled.
- For the confirmation of digital information and documents, a central system should be established by the government.

- Although it is believed that employment in the auditing profession will decrease, it is considered that it will change qualifications.
- Auditors are expected to focus more on analysis and interpretation.
- It is stated that there will always be an auditing and that the final decision will always be up to the person himself.
- Unless auditing sector keeps up with the transformation, the quality of the auditing will decline.
- It has been stated that the speed of data preparation in the business world will become increasingly important and therefore it is necessary to speed up their presentation to the public by auditing them. In this respect, it is perhaps expected that the results of the digital auditing will be disclosed for a much shorter period of time and that the level of assurance given will be brought under reasonable assurance.

The number of auditors included in the research could be widened. In addition to auditors, standard setters and regulatory bodies and firms could be added to the research.

YAZARIN BEYANI

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BİLGİLENDİRİLMİŞ ONAM

Katılımcılardan bilgilendirilmiş onam alınmıştır.

AUTHOR'S DECLARATION

This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support.

ETHICS COMMITTEE APPROVAL

This study was approved by the Ankara Hacı Bayram Veli University Ethics Committee (Date: 08.06.2020, Meeting No: 5, Decision No: 11054618-302.08.01).

INFORMED CONSENT

Written consent was obtained from the participants.

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