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Investigating the Impact of Digital Transformation of External Auditing on their Business in the Egyptian Context

Abstract

Technology improvements are reflected in the demand for audits. Some authors claimed that regarding the role of assurance, a new audit role is emerging. Some others claimed that the ability of auditing firms to guarantee audits in these new industries is what decides whether an audit may be spread to other fields. The profession's capacity to modify audit procedures and programs, pick up new skills, expand the scope of their audit services, and enhance their standing in these new fields are keys to whether this is possible. Examining the possibilities and challenges of the digital revolution of external audit and how it could impact Egyptian business is the goal of the current research. This research aims to investigate the effects of digital audit job transformation on audit process quality. It also seeks to ascertain how the digital revolution would affect the improvement of auditor performance in terms of efficiency and effectiveness. To achieve the research aim, a semi-structured interview is conducted with technology experts and auditing managers from Egyptian companies of external audit activities. The interviews' responses were examined using the qualitative analysis program NVivo - version 12. As a result, several themes and variables have been developed based on the results of thematic and content analysis of interviews with expert managers in external auditing. Results revealed that digital transformation of external auditing contributes to providing new services with added value, avoiding business challenges, as well as supporting innovation.

KeyWords: Digital Transformation, External Auditing, Audit Performance, Audit Quality, Audit Business.

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دراسة تأثير التحول الرقمي على أعمال المراجع الخارجي للحسابات في السياق المصري

ملخص البحث

تنعكس التطورات التكنولوجية في الطلب على عمليات المراجعة ونجد بعض المؤلفين يدعو إلى الإهتمام بدور الثقة كدور جديد للمراجعة بدأ في الظهور. بينما يدعى البعض الآخر أن قدرة مؤسسات المراجعة في هذه الصناعات الجديدة هي التي تقرر مدى امكانية إمتداد المراجعة إلى مجالات أخرى.

وتعتبر قدرة مهنة المراجعة على تعديل إجراءات وبرامج المراجعة، واكتساب مهارات جديدة، وتوسيع نطاق خدماتها، وتعزيز مكانتها في هذه المجالات الجديدة، هي مفاتيح لمدى إمكانية ذلك.

ويهدف البحث الحالي إلى دراسة إمكانيات وتحديات الثورة الرقمية للمراجعة الخارجية وكيف أثرت على سوق الأعمال التجارية المصرية. كما يهدف إلى دراسة أثر التحول الوظيفي للمراجعة الرقمية على جودة عملية المراجعة.

يسعى هذا البحث ايضا إلى التأكد من كيفية تأثير الثورة الرقمية على تطوير أداء المراجع من ناحية الكفاءة والفعالية.

ولتحقيق هدف البحث، تم إجراء مقابلات شخصية شبه منظمة مع خبراء التكنولوجيا ومديري المراجعة من الشركات المصرية التي تعمل في أنشطة المراجعة الخارجية.

وتم فحص ردود المقابلات باستخدام برنامج التحليل النوعي–NVivo الإصدار 12. ونتيجة لذلك، وضع الباحث مواضيع ومتغيرات اعتمادا على نتائج التحليل الموضوعي لمضمون المقابلات مع المديرين الخبراء في مجال المراجعة الخارجية للحسابات.

وكشفت النتائج أن التحول الرقمي للمراجعة الخارجية يساهم في تقديم خدمات جديدة ذات قيمة مضافة تجنبا لتحديات الأعمال، بالاضافة إلى دعم الابتكار.

الكلمات المفتاحية: التحول الرقمي، المراجعة الخارجية للحسابات، أداء المراجعة، جودة المراجعة، أعمال المراجعة.

1. Introduction

Because of the rapid changes occurring around auditing facilities, the auditing profession, taken in its entirety, is one of the most professions that is characterized by continuous development and modernization as well as intense competition among practitioners of the profession. As a result, it is essential for these establishments to keep up with technological advancements to be able to improve the performance of their auditors in a way that ensures using audit as a governance tool may help managers and stakeholders avoid possible conflicts and ensure that accounting information is disclosed (Al-Attar, 2021; Sinaga et al., 2022). As a result, it is crucial to stress audit quality as one of the main concerns of stakeholders (Carpe and Strate, 2021). This may be done by growing the auditing profession to guarantee that the needs of stakeholders and report users are addressed.

Digital transformation is one of the most significant forms of technological development during the current period, which had been defined as the process of transiting from paper to digital (Aksa et al., 2021). It represents the transformation of the world in all its aspects over the past decades by relying on the internet networks for communication and communication into a digital image. Several professions, including the auditing profession, which is one of those most impacted by technology advancements, have had a tremendous influence on society because of these changes (Lombardi et al., 2014). One of the professions that extensively relies on information is accounting, since it is crucial to give correct information to its users through financial statements that decision-makers can trust. Governments have thus created websites to help with more effective and efficient information delivery (Lee-Geiller and Lee, 2019).

Financial scandals from the early 2000s (Enron, WorldCom, Parmalat, etc.) witness to managerial trickery and highlight the drawbacks of this governance system. The audit quality must be raised for the audit to fully realize its promise as a governance tool. The effectiveness of the audit was assessed based on the chance that an auditor would identify discrepancies in the financial statements and alert the concerned parties (Kahyaoğlu, 2020). Higher audit quality encourages better investor decision-making, better management supervision, and an

improvement in the accuracy of financial data. It has been demonstrated in several prior studies that there is an increasing requirement for quality audit to reduce information asymmetry and enhance earning management. For instance, it showed how the audit quality is inversely correlated with income management. Moreover, additional research reveals that to invest in firms, investors, particularly those from outside, need greater audit quality and improved governance. As a mediating factor, audit quality has been shown in past research to have indirect and advantageous impacts on other governance methods (Manita et al., 2020).

These days, audit companies are digitizing, improving their internal procedures, and researching new ways to use big data and technology to benefit their clients (Sestino et al., 2020). This digitalization could improve audit quality and better satisfy investors and other stakeholders by making the audit more relevant (Lugli and Bertacchini, 2022). The use of digital technologies such as the analysis of big data allows the auditor to evaluate all data from the reviewed organization and abandon the sample approach. In fact, by identifying all abnormalities and providing answers to concerns expressed, the digitalization of audit procedures enables him to improve risk assessment and the standard of judgements. Not to mention, the audit may also focus on current data instead of only historical data to assess the current level of sales, the predicted order booking, etc. to offer a future perspective of the sustainability of the inspected firm (Lugli and Bertacchini, 2022).

It is still in the early phases of its first use in many sectors, the most important of which is accounting and auditing, despite the enormous technical growth that has taken place in the globe, of which digital transformation is one of the most significant mechanisms. Technological advancement and contemporary tools to address the crisis as a suitable alternative to company continuity and lessen the material and financial losses resulting from pausing operations for extended periods of time in various areas. It is anticipated that the digital transformation will positively and effectively affect the auditor's performance of his duties and improve the efficiency and effectiveness of the audit process given that the accounting and auditing professions are among those that seek to achieve the highest quality in professional performance. Therefore, the current paper aims to investi-

gate the opportunities and challenges of external audit digital transformation and its effect on audit business in Egypt. This paper is divided into seven sections, where the first one is the current introduction, the second is a review of literature, third is the research methodology, fourth is the results of the analysis, fifth is the discussion and conclusion, sixth is the research implications, and seventh is the research recommendations and limitations.

2. Literature Review

The goal of Karlsen and Wallberg (2017) is to better understand how digitalization affects the tools and procedures used by the audit profession. Semi-structured interviews were conducted with active auditors located in the middle of Sweden are used to achieve this, with a focus on interpretation. Due to paperless working practices and more flexibility, conclusions are formed that the impact on the auditors' working ways is more significant than on the equipment. Similarly, Adiloglu and Gungor (2019) aimed to better understand how digitization affects the instruments and procedures used by the audit profession in Turkey. It was found that only the Big Four make the required infrastructural and human resource investments in addition to offering these services. As a result, information technologies have become more significant because of digitalization. Yet, the audit companies have not yet invested in these areas as needed.

According to research from Omitogun and Al-Adeem (2019), seasoned auditors recognize and are proficient with using big data and data analytics in audit engagements in Saudi Arabia. Auditors are skilled in information technology and aware about big data and data analytics, according to a poll provided to accountants electronically. However, aside from Excel, many are inexperienced with associated data analysis tools and lack the necessary technical abilities.

In line with these changes, Frishammar et al. (2019) discussed innovation techniques, possibilities, and problems for Sweden manufacturing companies. Possibilities and problems are present in openness, sterilization, and digitalization. Because of these tendencies, it is necessary to reevaluate firm-specific trade-offs while auditing innovation. The study recommended audit methodology may assist businesses in completing and enhancing their current innovation auditing

procedures, enabling managers to review and assess their innovation efforts in light of the changing innovation landscape more effectively. As a result, it may aid businesses and managers in enhancing innovation audits, which consequently enhances innovation management.

The literature shows how organizations are becoming more interested in digitization. Manita et al. (2020) aimed to investigate how digitalization affects audit's operations and how it might enhance audit's function as a governance instrument in France. The five largest French auditing firms' auditors were interviewed using a qualitative approach. This study explains how digital technology is affecting audit businesses, particularly the audit role as a governance system, at five important levels. (1) As a result of digitization, audits will be more relevant, enabling audit companies to expand their service offerings (2). Additionally, it will raise audit quality by analyzing all consumer data (3). Finally, digitization has led to the emergence of a new auditor profile (4), fostering an innovative culture inside audit companies (5). As a result, the management team's discretionary authority will be constrained while the business governance will be strengthened. This study emphasizes the significance of putting digital strategies into practice to provide regulators the information they need to make the required changes to audit standards. It should make it possible for universities and business schools to modify their training programs to meet the requirements of the audit companies.

The goal of Özen and Gurel (2020) was to better understand how the digital twin approach, which is essentially one of the benefits of technological advancements, is used and how it has an impact on public auditing in Turkey. It also aims to make significant contributions to the audit quality by guaranteeing the security of data and information technologies with the aid of ongoing modern auditing provided by the digital twin. With the changes brought about by the so-called "Industry 4.0" era, digitalization has transformed several industries, cut expenses associated with operations, and saved time. To promote transparency, aspects that are pertinent, competitiveness, innovative, and cooperation among audit specialists, authorities must actively encourage completely open innovation strategies in the audit business.

Krieger et al. (2021) investigated the adoption of sophisticated data analytics by audit companies, a topic unexplored in earlier studies. With fourteen interview partners working in Germany, one in the United States (US), and one in Switzerland (CH), Germany (G) is significantly represented in the sample under study. From expert interviews, a process theory was developed explaining the process's activities and the organizational units involved. It goes on to explain how organizational, technical, and environmental context impact the adoption process. The report contributes to the body of research on the level of technology usage in auditing by providing a theoretical framework that has never been applied before and contextualizing known features of technology adoption. The study findings presented in this paper emphasize the importance of audit companies' technology skills for the adoption of sophisticated data analytics. Audit teams' technological resources may be used to help with both the conception of prospective use cases for sophisticated data analytics and the dissemination of solutions into practice.

According to Shahim (2021), to fully use the growth potential in Amsterdam, other approaches must be taken, as well as the entry into new markets. By using technology, the real and digital worlds are seamlessly combined to create an attractive and captivating whole. This blurs their borders and, as a result, lessens their distinction. This remarkable mix offers unmatched chances to interact with customers in a seamless manner and positively influence their experience. Other audiences' understanding of security was limited because of the frequent use of computer terminology. The financial statement audit's context became apparent when security components (such as logical access protocols used for identity, authentication, and authorization) were included, and it was then carried out for external auditors. It was challenging for these practitioners to properly comprehend the supplied result of the effort, however, as it was mostly described in Information Technology (IT) jargon and was unrelated to the financial statement. A swift and major shift in the context of security was brought about by the Sarbanes–Oxley Act (SOX) and the crucial role that IT plays in this setting. The audience increased as security and compliance issues dominated many C–levels' agendas (e.g., CFOs).

Witte et al. (2022) investigated how in–charge auditors use innovation audit tools (TBATs) to engage in institutional work and have an influence on audit quality in the small pond of nonglobal network firms (NGNFs), or companies other than the "Global 7" in USA. The findings indicate that people's ability to pursue institution work and bring about change is significantly predicted by learning experience, engagement budgets, and audit company culture. Evidence suggests that auditors absorb the timeframe of their activities in various ways. These viewpoints are indicative of the type of organizational activity auditors would do. Additionally, new process–theory research problem about the technical cultures, trainings, relationships between auditors and clients, and ceremonial practices of audit businesses are generated by data.

Through digital–based governance and using information technology as a moderating factor, Ismanidar et al. (2022) seek to examine and conceptualize the impact of auditor competency and remote audit support on audit quality in Indonesia financial audits. Information systems with digital–based governance can improve the audit through digital integration and transformation that wants to replace paper–based processes in auditing. As a result, in order to maintain audit quality, government agencies must offer remote auditing while using IT as their foundation for internal audit integration.

The main question raised by Faccia et al. (2022) was whether a permissioned blockchain ecosystem might enhance an open innovation (OI) paradigm and if it would be more suitable than the semi–open innovation (SOI) paradigm that now rules the external audit sector in United Arab Emirates. The challenges that are examined in this article. Notably, blockchain needs the right legal frameworks in place for transactions to be binding on the law. Additionally, diversified teams and large investments are required to build efficient blockchain ecosystems and use the possibilities of data analytics. Systematic analysis is done through a review of relevant literature, abductive reasoning, and practical modelling techniques. The results demonstrate the failure of the current external audit paradigm for semi–open innovation due to market concentration, conflicting interests, and even fraud. Authorities must actively support fully Open Innovation techniques

in the audit industry to ensure openness, features relevant, competitiveness, innovation, and collaboration among audit experts.

Rahman and Ziru (2022) was to determine if the level of digitization of customers and the IT skills of audit companies have an impact on audit quality (AQ) in China. The audit firm's digital expertise is determined by the percentage of employees with superior IT proficiency. Clients with high levels of digitalization attain AQ, according to a fixed-effect regression model. This study finds a strong and positive association between audit fees and AQ, demonstrating that if an audit firm's IT is sophisticated and mature, AQ will be high in the same situation. The findings confirm that consumer digitization and auditor knowledge have a moderating effect on AQ. The auditors' IT expertise lowers the audit risk and boosts AQ.

Alrashidi et al. (2022) sought to ascertain the influence of big data analytics (BDA) on Middle Eastern external auditing techniques. The findings show that BDA has an impact on audit procedures at all stages because it provides information that helps auditors better understand the client's internal and external surroundings, which in turn influences the decision to accept the audit assignment.

To determine the factors influencing the usage of technology in auditing, Afsay et al. (2023) offered a synthesis of technology-related auditing studies. 88 papers were reviewed to identify 21 characteristics, including origin country (developed or developing), user type (internal or external), technology kind (conventional or advanced), company size (Big 4 or non-Big 4), and publication date, that are pertinent to technology acceptability in auditing (before and after 2013). Findings demonstrate that facilitator conditions, perceived utility, and comprehension of simplicity of use are the most critical elements in a person's acceptance of technology. Cost-benefit analysis, pressure from the marketplace, organizational preparation, and task-task matching are all important elements in technology uptake. According to the findings, auditors in affluent nations and Big 4 audit companies are more impacted by perceived usefulness and subjective norm, whereas those in developing nations and non-Big 4 audit firms are far more influenced by perceived usability, enabling circumstances, and organizational variables. Under-

standing the usability, arbitrary standards, and top management backing have a greater impact on adoption of conventional systems than modern ones. By evaluating technological acceptability variables in auditing, this study adds to the body of knowledge and offers policy, practice, and research implications.

3. Research Methodology

A semi–structured interviews is conducted by a total of 13 technology professionals and auditing managers from Egyptian businesses. The interview includes 10 questions covering the variables influencing the deployment of digital transformation of external auditing. The interview questions given to the targeted sample of Egyptian auditing managers and technology professionals are shown in Table 1. The questions are put to a variety of experts up till redundancy of data occurs; at that point, it signals that the sample is large enough and there is no need to interview any further people. The NVivo – version 12 software, a tool for qualitative analysis, was used to examine the interviewees' responses. Thematic analysis, which displays the relative value of each topic identified by the investigation, was used to conduct the analysis. The analysis involves the first coding, which identifies the codes using a word cloud and a word frequency table. As a result, the codes and themes are categorized, and a mind map is shown illustrating the research variables.

Table 1: Interview Questions

	Questions
1.	How many years of experience do you have?
2.	In which department do you work?
3.	How does your company keep pace with the recent technological transformation?
4.	Who are the entities that carry out external auditing in Egyptian company?
5.	What do you think of the process of digital transformation of the external audit?
6.	In your opinion, does the digital transformation of the external audit have an impact on the companies' performance?
7.	What opportunities do companies get when developing to digital transformation of the external audit?
8.	What challenges do companies face when developing to digital transformation of the external audit?

	Questions
9.	How can the process of digital transformation of the external audit be developed?
10.	Do you have any recommendations about digital transformation of the external audit?

4. Results And Findings

Using thematic analysis, the researcher carefully analyses the data to find recurring themes—topics, notions, and meaning patterns. The process of doing a thematic analysis may be done in several ways, but the most popular method involves six steps: familiarization, coding, topic generation, theme review, theme definition and name, and writing up. Thematic analysis, however, is a versatile technique that may be used to several other types of study (Braun and Clarke, 2019).

Figure 1 shows a word cloud of the 200 terms that appeared at least three times the most frequently to evaluate this data in relation to the research topics of the study. These phrases all fit quite well with the goals of the study. Additionally, it improves the data's reliability and applicability to the research. This word cloud wins the chance to create themes. Consequently, the researcher selected four main themes from the word cloud, including "data", "information", "audit", "digital", "external".

Figure 1: Word Cloud

Defining themes entails articulating precisely what each theme means and determining how it aids in comprehension of the facts. The process of naming themes is coming up with a brief and clear name for each theme. To comprehend the response to the study questions presented in table 2, these four primary themes are divided into many sub-themes.

Table 2: Summary Table of Main Themes

Theme	Code		Reference	Total
New Services of Digital Transformation of External Audit	1)	Process customer data	4	15
	2)	Audit files documentation	3	
	3)	Data analysis	4	
	4)	Cognition and Cloud Technologies	4	
Auditors Innovation	1)	Automated data collection's importance	3	13
	2)	Circularization process' digitalization	3	
	3)	Working paper opening automation	2	
	4)	Global Customer Data Reconciliations with Financial Accounts	2	
	5)	Billing checks	3	
Auditors Business Challenges	1)	Digital crimes	3	15
	2)	Data security and privacy problems involving corporations	6	
	3)	Difficult of data and information standardization	3	
	4)	Lack of Skilled and Trained Auditors	3	
Digital Transformation Add-Value	1)	Save time	5	18
	2)	Cut costs	3	
	3)	Greater degree of quality	5	
	4)	Reduce information asymmetry	3	
	5)	Boost stockholder confidence & increase investment judgement	3	

Second, the interviews were compiled, examined, and their respondents' responses looked into utilizing content analysis. In this stage, the researcher additionally assesses the interviewees' replies using a word frequency table to identify the key themes that may be gleaned for the study by cascading the words into categories.

4-1 Theme of New Services of Digital Transformation of External Audit

From the interviews, the first theme is generated, which is the theme of new services of digital transformation of external audit, and from it several codes are generated, represented in the following: process customer data, audit files documentation, data analysis and cognition and cloud technologies. These codes are illustrated in Figure 2, where the codes are presented for the theme of new services of digital transformation of external audit.
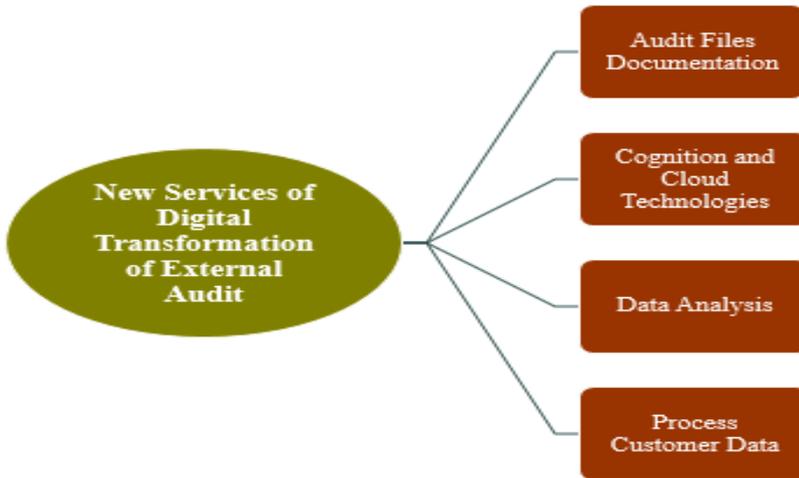
Figure 2: Mind Map of Theme of New Services of Digital Transformation of External Audit

4-1-1 Process Customer Data

One of the most important processes that digitizing external auditing is concerned with is the processing of customer data for this company, by collecting and analyzing correct data and knowing their opinions about the company's products or services, checking the complaints submitted by them, and finding out who are the customers who are most looking forward to the product or service of this company, among them, appropriate reports are provided that help in the development of the company, and it also provides reliable information to customers about the company and its products, on an ongoing basis and is easily accessible. This code was discussed in the interviews, and this was shown in the evidence that appeared in the second interview:

"It enables the switch from a risk-based strategy to one that examines all data, enabling businesses to provide their customers smarter and more pertinent services."

Moreover, the fourth interview confirmed this, and this was shown in the following evidence:

"The auditor cannot keep up with the growing size of the customers data."

The sixth interview discussed this in the following evidence:

"Digitalization should alter how auditors conduct audit tasks by supplying more information to address consumer demands."

Moreover, some evidence appeared in the eighth interview, as follows:

"Due to the benefits that artificial intelligence offers in a variety of sectors, it is anticipated that the references will assist the author in carrying out his job efficiently and in giving the data and supporting arguments required for the review process."

4-1-2 Audit Files Documentation

In addition, the process of documenting audit files is greatly affected by the digital transformation of external auditing, and this is because it is easier as documents are uploaded to digital devices and then analyzed and has a negative impact on cost as well as a positive impact on time, and this is because this process takes place in less time Much of the time this step is done in the traditional way. Documenting the audit files in a digital way makes the data more reliable and accurate. This code was discussed in the interviews, and this was shown in the evidence that appeared in the fourth interview:

" It is crucial for policymakers to design appropriate audit standards and pertinent analytical technologies for big data by combining and explaining considerations of practical demands and business trends in order to use smart audit practices to increase audit assurance and audit quality"

Moreover, the seventh interview confirmed this, and this was shown in the following evidence:

"Audit file documentation is enhanced by the capacity to perform another time the check later made possible by digitization, which enables a true traceability procedure."

In the thirteenth interviews, these evidences about this code were revealed:

"It helps in providing documented files free of errors, and even in the event of any error that is easy to solve."

4-1-3 Data Analysis

There is no doubt that data analysis methods using digital transformation save a lot of time and are more accurate than traditional data analysis methods that are done manually. This is because manual analysis methods make a lot of errors and are subject to repetition several times, and this is due to the difficulty of finding out the error and fixing it. Accordingly, the digital transformation of external auditing will help a lot in the process of analyzing financial data and data related to customers and shareholders. This code was discussed in the interviews, and this was shown in the evidence that appeared in the first interview:

"We have more time thanks to digital transformation to do better analysis and offer valuable advice, findings, and strategies to improve"

Moreover, the third interview confirmed this, and this was shown in the following evidence:

"Paying close attention to data analysis is one of the most important factors that must be taken into account in order to accomplish the right growth of external auditing. This is so that auditors can offer their clients suggestions and standards, including indications and statistics, by employing data analytics. Auditors will be able to draw precise and pertinent findings from an analysis of the raw data that is supplied in the anticipated format for speedy interpretation."

The sixth interview discussed this in the following evidence:

"involvement in analytics and other digital technologies, including as computer vision, data visualization, data transformation, and data mining, allows auditors to discover anomalous transactions inside the client's system and helps to build them"

In the thirteenth interviews, these evidence about this code were revealed:

"One of the most important elements that must be developed is the huge data analysis programs, and this is because it is one of the important tools in review facilities as it improves the quality of the review guide and helps the references to identify operational risks and cheat better."

4-1-4 Cognition and Cloud Technologies

One of the most important elements affecting the digitization of external audit-ing, as the interviewees explained, are cloud and cognitive technologies, because the cloud makes it possible to store information or programs on remote loca-tions, often computer servers. Cognitive technology teaches a computer to eval-uate like an auditor using principles of machine learning and artificial intelli-gence. Therefore, it enhances the process of relying on the cause of digital trans-formation, and helps its development, because there is a wide range of data stor-age space, from which any process of losing any information or data is avoided, and data is stored in the long term. This code was discussed in the interviews, and this was shown in the evidence that appeared in the first interview:

" The audit technique is impacted by cloud and cognitive technologies, which also improve the control procedures"

Moreover, the third interview confirmed this, and this was shown in the follow-ing evidence:

"Our efforts would be more successful if we were connected to the cloud, as this enables the storage of information or programs on remote servers, which is often done using computers."

Moreover, some evidence appeared in the ninth interview, as follows:

"It is possible by paying attention to the development of cognition technology, and this gives a greater and broader scope for information, its integration and storage, and helps in data analysis processes."

In the eleventh interviews, these evidences about this code were revealed:

"By developing cloud computing, which is a type of computer program that provides all data and applications to users as services provided via the Internet and

allows the storage of data and programs on the server available on the computer. Using accountable accounting programs on cloud computing, accountants, helps to access all types of information on the Internet to serve customers at anytime and anywhere."

The key phrases that indicate the theme of new services of digital transformation of external audit and its codes, their count, and their weights are summarized in Table 3.

Table 3: Word Frequency Table for Theme of New Services of Digital Transformation of External Audit

Word	Length	Count	Weighted Percentage (%)
process	7	14	0.75
customer	8	4	0.21
customers	9	8	0.43
data	4	76	4.06
audit	5	44	2.35
file	4	2	0.11
files'	6	2	0.11
documentation	13	4	0.21
analysis	8	12	0.64
cognitive	9	2	0.11
cloud	5	8	0.43
technologies	12	8	0.43

4-2 Theme of Auditors Innovation

From the interviews, the second theme is generated, which is the theme of auditors' innovation, and from it several codes are generated, represented in the following: automated data collection's importance, circularization process' digitalization, working paper opening automation, global customer data reconciliations with financial accounts and billing checks. These codes are illustrated in Figure 3, where the codes are presented for the theme of auditors' innovation.
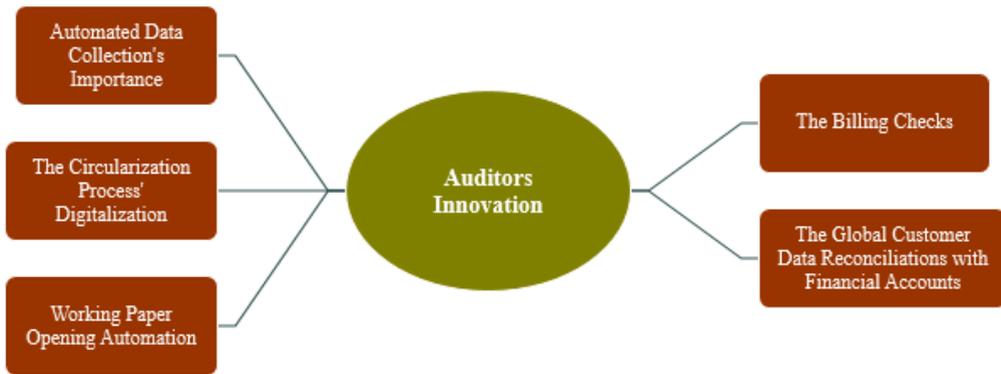
Figure 3: Mind Map of Theme of Auditors Innovation

4-2-1Automated Data Collection's Importance

According to the respondents, the first opportunity presented by the interviews for the digital transformation of external auditing is the change of the data gathering process from being conventional to electronic, which in turn helps speed up data collection. Additionally, it guarantees the accuracy of the data and the validity of the analysis. It also lowers the likelihood of errors occurring throughout the external audit's scrutiny procedure. The report must contain an assessment of the fairness of the financial accounts, and it must cover every aspect of internal control, accounting, and other aspects, with samples chosen based on risk and relative relevance. This code was discussed in the interviews, and this was shown in the evidence that appeared in the second interview:

"By automatically and quickly collecting data and then readily evaluating it using algorithms"

Moreover, the seventh interview confirmed this, and this was shown in the following evidence:

"There is an opportunity in the automated data collection that takes place through the digitization of the external audit."

Moreover, some evidence appeared in the ninth interview, as follows:

"It facilitates the data collection process, by automatically converting it, and this is because searching through many paper documents consumes a lot of time."

4-2-2 Circularization Process' Digitalization

The second opportunities provided by the interviews, according to the interviewees, for the digital transformation of external auditing is the digitization of the generalization process, and in this process data, information, and results are circulated, and one of them guarantees the reliability of these results because there is no inconsistency in them. This code was discussed in the interviews, and this was shown in the evidence that appeared in the first interview:

"It enhances the audit files' documentation since digitalization makes actual traceability possible by making it possible to recreate the control in the future."

Moreover, the fifth interview confirmed this, and this was shown in the following evidence:

"Companies may digitize external audits by using data mining to visualize data operations against predetermined workflows to find and evaluate exceptions. The workflow method allows us to directly extract data as frequently as necessary thanks to data mining."

In the tenth interviews, these evidence about this code were revealed:

"The majority of activities that occur within the company are to the technical orientation and digital transformation, which in turn aids in what is known as the circularization process."

4-2-3 Working Paper Opening Automation

The third opportunities provided by the interviews, according to the interviewees, for the digital transformation of external auditing is the automation of opening the worksheet. Certainly, the interviews showed that the processes of opening the papers take a lot of time at the beginning, just to count the papers and invoices of the institution. It may require many auditors for this process. It is also the cause most of the time in the errors that occur in the audit. This code was discussed in the interviews, and this was shown in the evidence that appeared in the second interview:

"Among them is working paper opening automation, and this is because all se-curities are analyzed and approved using electronic devices, and this makes the analysis process more accurate."

Moreover, the sixth interview confirmed this, and this was shown in the follow-ing evidence:

"It shortens the time required for opening paperwork because it transforms this process into an electronic one, which is more effective. Opening and closing worksheets typically takes teams from 3–5 working days, but with digitization, this task is carried out quickly and efficiently."

4-2-4 Global Customer Data Reconciliations with Financial Accounts

The fourth opportunities provided by the interviews, according to the inter-viewees, for the digital transformation of external auditing is the global customer data reconciliations with the financial accounts. This is what some of the coun-terparties provided. This is an opportunity in the case of exporting products, and this is to collect customer data abroad. But this is not an opportunity for compa-nies operating on a local scale only. This code was discussed in the interviews, and this was shown in the evidence that appeared in the fourth interview:

"It will help reconcile global customer data with financial accounts, and this in turn will help us develop the product effectively for what customers need."

Moreover, the eleventh interview confirmed this, and this was shown in the fol-lowing evidence:

"In my view, it is important in the case of international companies that export the products, and this is because the digital transformation helps to settle the cus-tomer's international data with the financial accounts of the company, and the ease of accessing, collecting and analyzing these data."

4-2-5 Billing Checks

The fifth opportunities provided by the interviews, according to the interview-ees, for the digital transformation of external auditing is bills and checks. As the digitization of the audit process helps to exhale invoices and checks and copies of them electronically, and this is to ensure that they are not lost. Whereas, in the

event of its loss, it may lead to an imbalance in the budget, and this is because there is a shortage between revenues and expenditures. This code was discussed in the interviews, and this was shown in the evidence that appeared in the third interview:

"Adopting the digital transformation of the external audit helps in converting all operations from paper to electronic, for example, for invoice checks."

Moreover, the fifth interview confirmed this, and this was shown in the following evidence:

"The bills are also converted into digital, and this helps to quickly count them."

In the twelfth interviews, these evidence about this code were revealed:

"One of the most important opportunities is to transfer electronic bills checks, and this helps to ease their inventory, assembly and analyze them, and this is because this step is the most exhausting and difficult steps for auditors."

The key phrases that indicate the theme of auditors' innovation and its codes, their count, and their weights are summarized in Table 4.

Table 4: Word Frequency Table for Theme of Auditors Innovation

Word	Length	Count	Weighted Percentage (%)
automated	9	2	0.11
data	4	76	4.06
collection	10	6	0.32
importance	10	2	0.11
process	7	14	0.75
digitalization	14	4	0.21
working	7	4	0.21
paper	9	2	0.11
opening	7	6	0.32
automation	10	4	0.21
global	6	2	0.11
customer	8	4	0.21
financial	9	6	0.32
accounts	8	4	0.21
bills	5	6	0.32
checks	6	4	0.21

4-3 Theme of Auditors Business Challenges

From the interviews, the third theme is generated, which is the theme of auditors' business challenges, and from it several codes are generated, represented in the following: digital crimes, data security and privacy problems involving corporations, difficult of data and information standardization and lack of skilled and trained auditors. These codes are illustrated in Figure 4, where the codes are presented for the theme of auditors' business challenges.

Figure 4: Mind Map of Theme of Auditors Business Challenges

4-3-1 Digital Crimes

Digital crimes are the first code that appeared, and this is because it represents the challenges that can prevent the adoption of digitization for external auditing. These crimes are represented in the presence of different data and conflicting information on electronic devices. Some viruses can in turn erase all data and documents. This code was discussed in the interviews, and this was shown in the evidence that appeared in the second interview:

> *"The technological reliance on auditing prevents the data from being exposed to digital crimes and hacking of this data."*

Moreover, the seventh interview confirmed this, and this was shown in the following evidence:

> *"There are many digital crimes, which may cause the information provided by the external audit to be unreliable in case it is digitized."*

Moreover, some evidence appeared in the thirteenth interview, as follows:

"Electronic crimes can be the most effective risk of technology adoption in external audit, due to the presence of some secret information that must be maintained from detection."

4-3-2 Data Security and Privacy Problems Involving Corporations

Data security and privacy problems involving corporations are the second code that appeared, and this is because it represents the challenges that can prevent the adoption of digitization for external auditing. As I explained in the previous code, the company's data and documents can face several electronic problems, and this is what makes the data insecure, through hacking operations, it can be easily hacked and manipulated, so national protection programs must be designed to ensure the privacy of this data and to protect the company. This code was discussed in the interviews, and this was shown in the evidence that appeared in the third interview:

"The challenge is privacy and security, as the automation of data can cause significant security problems and lack of privacy for data."

Moreover, the fifth interview confirmed this, and this was shown in the following evidence:

"This is a danger that the digital transformation may encounter, and it arises from the auditors' ignorance of the necessity to establish data protection policies, which may result in certain security problems"

"This is to link the information technology department with the audit department, and from them the information technology department ensures more secure systems on data."

The sixth interview discussed this in the following evidence:

"To gather data in a secure manner and in a format that can be used by the instruments of an audit company."

In the tenth interview, these evidences about this code were revealed:

"Security problems can be the biggest challenges facing the adoption of digital transformation, not only in auditing, but in all operations and fields, so I think

that companies should include a large section of information technology in order to develop secure systems and preserve data."

"I think linking the IT department with the audit department ensures more secure systems on the data, and helps to provide strong proposals for development."

4-3-3 Difficult Of Data and Information Standardization

Difficult of data and information standardization are the third code that appeared, and this is because it represents the challenges that can prevent the adoption of digitization for external auditing. One of the challenges that the company faces is the difficulty of standardizing data and information, and from it is difficult to reach clear results for the company's budgets, and in this case, it is necessary for electronic devices to solve this problem, so some companies may find the digital conversion process for external auditing useless. This code was discussed in the interviews, and this was shown in the evidence that appeared in the first interview:

"The standardization of information can be a challenge that directs the adoption of digital transformation of the external audit."

The fourth interview discussed this in the following evidence:

"The quality of the audit may suffer from the analysis of information that is not pertinent to an audit, is not properly regulated, is unreliable, or whose external source isn't well understood."

Moreover, some evidence appeared in the eleventh interview, as follows:

"There is difficulty in the market information standardization and integrating it with the company's information."

4-3-4 Lack of Skilled and Trained Auditors

Lack of skilled and trained auditors are the fourth code that appeared, and this is because it represents the challenges that can prevent the adoption of digitization for external auditing. The cost of training auditors is the reason for the lack of training that companies can provide with the aim of digital development in their systems. Likewise, the lack of technology skills of auditors and employees is a

factor that also affects the adoption of digital transformation in external auditing. This code was discussed in the interviews, and this was shown in the evidence that appeared in the eighth interview:

"The most significant of which is the requirement for qualified auditors with high skills and coaches who are adequate and effective in dealing with these modern technological tools in order to meet the resulting collection and operation of large data and its understanding of this technology."

Moreover, some evidence appeared in the ninth interviews, as follows:

"Its adoption can be difficult, and this is due to the lack of information and training for the auditors, and obtaining information and learning to deal with these systems requires great effort on us."

In the twelfth interviews, these evidence about this code were revealed:

"The performance of the auditors may be impacted by technology advancement and the digital revolution, which might result in changes to the accounting and review professions due to changes in professional standards and audit facilities' level of service."

The key phrases that indicate the theme of auditors' business challenges and its codes, their count, and their weights are summarized in Table 5.

Table 5: Word Frequency Table for Theme of Auditors Business Challenges

Word	Length	Count	Weighted Percentage (%)
digital	7	30	1.60
crimes	6	6	0.32
data	4	76	4.06
security	8	8	0.43
privacy	7	4	0.21
problems	8	6	0.32
difficult	9	4	0.21
information	11	48	2.57
standardization	15	4	0.21
lack	4	4	0.21
skills	6	2	0.11
training	8	2	0.11
auditors	8	18	0.96

4-4 Theme of Digital Transformation Add-Value

From the interviews, the fourth theme is generated, which is the theme of digital transformation add–value, and from it several codes are generated, represented in the following: save time, cut costs, greater degree of quality, reduce information asymmetry and boost stockholder confidence and increase investment judge-ment. These codes are illustrated in Figure 5, where the codes are presented for the theme of digital transformation add–value.
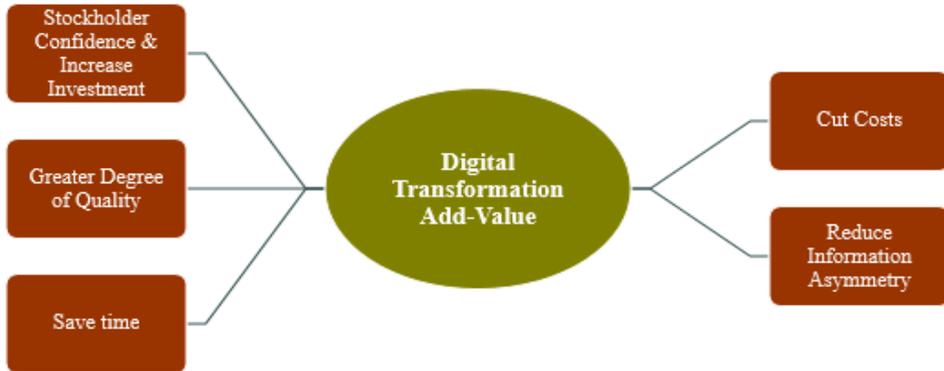

Figure 5: Mind Map of Theme of Digital Transformation Add-Value

4-4-1 Save Time

The first code of consequences of external audit transformation theme are save time. This code shows the impact of adopting the digital development of exter-nal auditing on the company's performance. Preserving time was an important element that many interviewees talked about and showed its importance and how it has an impact on the internal performance of the company, as well as the employees. This code was discussed in the interviews, and this was shown in the evidence that appeared in the second interview:

"New digital technologies enable auditors to undertake specific audit procedures and save a substantial amount of time."

The fifth interview discussed this in the following evidence:

"It saves a lot of time needed to review all bills."

Moreover, some evidence appeared in the ninth interview, as follows:

"I think, is in reducing the time of the review process, and this is because in traditional review processes it takes a long time to work on them."

In the thirteenth interviews, these evidence about this code were revealed:

"It is necessary to be prepared accurately as the inaccuracy may lead to the damage of a huge number of transactions in a short time."

4-4-2 Cut Costs

The second code of consequences of external audit transformation theme are cut costs. This code shows the impact of adopting the digital development of external auditing on the company's performance, and it shows from the interviewers how this development affects reducing the costs of the companies' operations. This code was discussed in the interviews, and this was shown in the evidence that appeared in the second interview:

"Digitization considerably lowers the cost of audits."

The fifth interview discussed this in the following evidence:

" this is by not only saving time but also saving cost, as the cost of traditional external auditing increases the cost of collecting information and forming a committee of several individuals"

Moreover, some evidence appeared in the eleventh interview, as follows:

"One of its most important advantages is that there are no fees for updating the program and therefore this is a reduction in cost."

4-4-3 Greater Degree of Quality

The third code of consequences of external audit transformation theme are greater degree of quality. It shows by the interviewers how this development affects increasing the quality of the companies' services or products from the point of view of the interviewees. This code was discussed in the interviews, and this was shown in the evidence that appeared in the first interview:

"To increase audit quality and efficiency, the auditor may swiftly evaluate all of the data rather than manually evaluating sample data"

"I said it help to improve the quality of the product as it gives a reliable infor-mation from external party."

The seventh interview discussed this in the following evidence:

"We can do duties more easily, and it ensures the accuracy of information and the effectiveness of the services the business offers to clients."

Moreover, some evidence appeared in the eighth interview, as follows:

"It has a significant impact on the company's quality information and data, so we get more documented results in the company, so it is useful and adds a competi-tive advantage to the company that it adopts."

In the ninth interview, these evidence about this code were revealed:

"I anticipate that the digital transformation will lead to some significant changes in the review process's quality, particularly with regard to some applied review procedures and the timing of the audit report."

4-4-4 Reduce Information Asymmetry

The fourth code of consequences of external audit transformation theme are re-duce information asymmetry. Another advantage added by the adoption of digi-tal transformation is that it reduces the asymmetry of information, and this was shown by the interviews. This code was discussed in the interviews, and this was shown in the evidence that appeared in the second interview:

"The highest degree of assurance for the inspection comprises an opinion on the correctness of the financial statements in its report as well as a comprehensive in-vestigation of all pertinent internal control, accounting, and other aspects, with samples selected based on risk and relative relevance."

The sixth interview discussed this in the following evidence:

"This is because accounting systems and other information systems will become more connected and secure. This will lessen issues with risk transfer and knowledge asymmetry between management and stakeholders."

Moreover, some evidence appeared in the eighth interview, as follows:

"One of the numerous benefits of the digital revolution is the simplicity of communication and information access, which frees up time for information gathering."

4-4-5 Boost Stockholder Confidence and Increase Investment Judgement

The fifth code of consequences of external audit transformation theme are boost stockholder confidence and increase investment judgement. Enhancing shareholder confidence is one of the most important advantages that can attract many companies to adopt digital transformation within them, and this is because it helps in providing investment judgment because the company's data is always available and easy to access in addition to being reliable. This code was discussed in the interviews, and this was shown in the evidence that appeared in the third interview:

"As it provides reliable information, and this is what increases the company's reliability with investors and increases the external investment of the shareholders in the company"

The fourth interview discussed this in the following evidence:

"It enhances the confidence of shareholders by providing them with reliable and accurate information in a short time."

In the twelfth interviews, these evidence about this code were revealed:

"It has a good effect on the company's performance, as it was previously found, and this is a course that also helps to increase the confidence of the shareholder in the company, due to the accuracy and quality of the company's data and its statistics."

The key phrases that indicate the theme of digital transformation add-value and its codes, their count, and their weights are summarized in Table 6.

Table 6: Word Frequency Table for Theme of Digital Transformation Add-Value

Word	Length	Count	Weighted Percentage (%)
save	4	2	0.11
time	4	24	1.28
cost	4	10	0.53
greater	7	2	0.11
quality	7	16	0.86
information	11	48	2.57
asymmetry	9	2	0.11
confidence	10	6	0.32
increase	8	6	0.32
investment	10	2	0.11

5. Discussion and Conclusion

First, new services of digital transformation of external audit theme are the first theme compiled from the codes that appeared in the interviews, where codes such as process customer data, audit files documentation, data analysis and cognition and cloud technologies are integrated. Second, auditors' innovation theme is the second theme compiled from the codes that appeared in the interviews, where codes such as automated data collection's importance, circularization process' digitalization, working paper opening automation, global customer data reconciliations with financial accounts and billing checks are integrated.

Third, auditors' business challenge's theme is the third theme compiled from the codes that appeared in the interviews, where codes such as digital crimes, data security and privacy problems involving corporations, difficult of data and information standardization and lack of skilled and trained auditors. Fourth, digital transformation add–value theme is the fourth theme compiled from the codes that appeared in the interviews, where codes such save time, cut costs, greater degree of quality, reduce information asymmetry and boost stockholder confidence and increase investment judgement are integrated.

To raise organization knowledge of the digital transformation of external auditing, a number of themes and variables have been constructed based on the findings of thematic analysis of interviews with expert managers in external au-

diting. The purpose of this study is to create a brand–new decision–support system for organizational performance in the context of external auditing's digital revolution. Figure 6 concludes with a mind map that summarizes all the issues raised by the interviewees' comments.
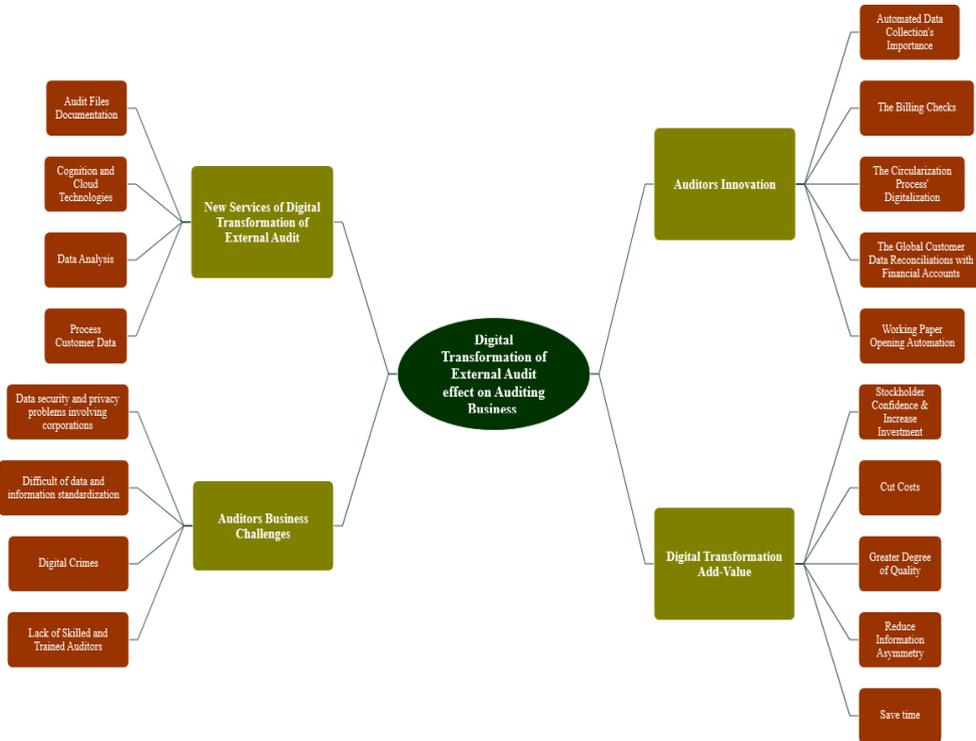

Figure 6: Paper Mind Map

6. Research Implications

The goal of the study is to enhance external auditing while also examining the opportunities and difficulties presented by the digital revolution of external auditing and how it affects Egyptian audit business. Because of this, the study's interviews with specialists were its main emphasis. This section introduces the study's academic and practical implications.

Academic implications: The difficulties associated with the digital transformation of external auditing are addressed by talking about them in interviews and getting advice from experts on how to deal with them. The opportunities associated with the digital transformation of external auditing are also dis-

cussed, including knowing the best way to effectively take advantage of these opportunities.

Practical implications: This study helps firms grasp the value of implementing the digital transformation of external auditing and gives decision-makers a clear idea of its significance. Additionally, it offers a comprehensive knowledge of how the digitalization of external audits has affected how well companies' function.

7. Research Recommendations And Limitations

The results above means that it is important to invest in their partners' and workers' training and using the appropriate technology, as well as digitization of routine, low-value tasks to boost brand recognition in the marketplace. In addition, it is worth considering reorganizing audit teams and redistributing duties to account for the digitalization of some processes and allow for the enhancement of the auditing process. Moreover, decision makers should establish research facilities and team up with accelerators or other online players on initiatives such as the development of new tools for data analysis, control, etc.

Managers should also promote an innovation at all levels to keep up with market developments and steadily enhance audit services, as well as creating teams that work on the secure tool-compatible data collection and transfer of consumer information.

Human resources should also develop a new hiring approach that places a focus on digital talent, new abilities, and dual skill profiles. Audit facilities must keep up with technological advancements and adapt to environmental changes by holding the required training programs for auditors to qualify them and enhance their skills in using digital transformation techniques and contemporary technological means to perform their work, as well as by providing the necessary hardware and networks to implement digital transformation in audit facilities.

The research also made some recommendations for governments to help develop the external audit process, as well as some recommendations for scientific institutions, future researchers in the same field, to pay attention to some topics that help in developing external auditing using digital transformation, and these

recommendations were: (1) the importance of academic institutions educating students to cope with contemporary technology tools by giving him access to scientific data during his study time and updating accounting and auditing courses to reflect current trends, (2) Likewise, the need for professional organizations to hold tests for candidates to work in the auditing profession to determine their ability to use digital transformation techniques in their field of work in the future, to become a certified auditor to work in auditing offices, (3) The need for academics and researchers to conduct more scientific research and shed light on the importance of applying digital transformation technologies such as artificial intelligence, big data, robots, and cloud computing in auditing facilities and the impact of their application on the auditing profession, (4) The need for regulators and standards setters to issue standards and guidelines in line with modern technological developments and their application in the field of auditing.

There are methodological limitations in the research. Given sample size, the conclusions of this study cannot go beyond the exploratory framework. New research directions can finish this job. First and foremost, it is crucial to do research on how to improve corporate governance by digitizing internal audit processes. Furthermore, it is critical to determine if digitizing internal control systems would strengthen audit committees' role as a governance mechanism and restrain managers' opportunistic behavior. Because small auditing firms lack the resources of large ones to embrace technology and develop new services, it is equally interesting to look at how digitization impacts them. Finally, it is crucial to look at how digitization influences audit companies' hiring procedures.

The study indicates that future research includes a wider period so that it includes a larger sample size for the study. The first limitation may be reflected in the timing, because the data obtained for the study contain a limited time. The fact that this research is limited to selecting a sample of highly experienced managers, employees with less experience are not considered. As a result, it is also advisable to conduct more research including the sector with employees and managers in different business sectors rather than focusing on a specific sector. In addition, the scope of this study is limited to Egypt, a developing country, and it does not consider the opinions of other specialists in the Middle East. Therefore,

he suggested focusing on more developing countries (especially those in the Middle East) to study the effects of this new paradigm on different countries and to generalize the results.

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Appendix 1: Interview Questions

	Questions
1)	How many years of experience do you have?
2)	In which department do you work?
3)	How does your company keep pace with the recent technological transformation?
4)	Who are the entities that carry out external auditing in Egyptian company?
5)	What do you think of the process of digital transformation of the external audit?
6)	In your opinion, does the digital transformation of the external audit have an impact on the companies' performance?
7)	What opportunities do companies get when developing to digital transformation of the external audit?
8)	What challenges do companies face when developing to digital transformation of the external audit?
9)	How can the process of digital transformation of the external audit be developed?
10)	Do you have any recommendations about digital transformation of the external audit?