

## **Digital transformation using artificial intelligence technology and its role in enhancing the audit process (opportunities and threats): A**

### **Review**

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### **Abstract:**

Digital transformation using artificial intelligence (AI) systems has brought about major changes in the auditing process, as artificial intelligence is one of the most important technologies used in digital transformation. However, opponents of the artificial intelligence revolution view this progress as a step backward, which will lead to the failure of many auditors to adapt to this new environment, which in turn will lead to their decline. The problem of our research is to answer the following question: "To what extent does the use of artificial intelligence technology contribute to enhancing the auditing process. The answer will be provided by stimulating scientific discussion in an expanded manner about the use of artificial intelligence technology and its role in enhancing the auditing process by reviewing the most important literature that deals with artificial intelligence technology and its role in enhancing the auditing process using the analytical approach, and indicating the most important opportunities and threats facing its adoption. Our study adds value by showing how AI technology can be used to enhance the audit process. Second, it helps companies determine whether they have the capacity to adopt AI technology in the audit process by providing a comprehensive view of the threats and opportunities resulting from this decision.

**KEYWORDS:** (Digital transformation, artificial intelligence, Audit, opportunities & threats).

## 1. Introduction

The development in business intelligence and the use of computers has led to increased interest in using modern technologies in the audit process, as this leads to overcoming some aspects of human shortcomings when exercising professional judgment, and this is reflected in the audit process's increased effectiveness and efficiency. The new audit procedures incorporate the idea of risk, which has a strategic component relating to the economic unit's capacity to meet its goals. This requires auditors to rely on advanced technology that can identify the factors that prevent the unit from achieving its objectives (Al-Samarrai & Al-Sharida, 2020), which is called the transition stage to digital transformation. In recent years, digital transformation has received unprecedented international and local attention as a result of the tremendous boom brought about by the technological revolution in many sectors, and the amazing development in devices, machines, and smart systems that have provided innovative solutions in shortening time, reducing costs, and achieving greater efficiency in production processes, which works to achieve unprecedented changes occurring in the economy and labor market, in turn generating increased competition between various companies to keep pace with economic complexities, technological progress, and business risks (Dhaif et al. 2023), In addition, issues with their integrity, reliability, completeness, and security are brought on by the growing number of reports that are available. Applying new technology creates new business opportunities and risks, which indirectly affect IT auditing since it encounters new requirements and risks. (Alaba& Ghanoum, 2020). From the above, Digital transformation's effects on the audit process can be positive or negative, so the most important opportunities and threats will be explained using one of the key components of

the digital transformation, which is artificial intelligence, in order to respond to the question:

*How much does using artificial intelligence technology help to improve the audit process?*

## **2. Theoretical framework and Literature review**

### **2.1 Digital transformation and artificial intelligence**

Digital transformation is a huge development that leads to a completely new way of thinking and performing, and it is also a step towards change in the context of companies' work from the traditional system to the digital system. This happens by linking one of the new elements of digital transformation, artificial intelligence, to all aspects of the company, including leadership, performance, culture and environment. The Dartmouth Conference on Artificial Intelligence, which took place in 1956, is credited with giving rise to artificial intelligence. In particular, the term "artificial intelligence" was first used in the conference proposal. According to John McCarthy, Marvin Minsky, Claude Shannon, and Nathaniel Rochester, the concept that "every aspect of learning or any other feature of intelligence can in principle be described so precisely that a machine can be made to emulate it" served as the cornerstone of artificial intelligence research. The Dartmouth conference put a strong emphasis on the automation, language-capable computers, and the ability of artificial intelligence to expand. (Cordeschi, 2007). In the early 1970s, the term artificial intelligence technology became noticeable among scholars, and a large amount of work related to this technology was conducted (Anh,2021& Anh).

According to Elaine(2000) and quoted from Chukwudi et al. (2018), artificial intelligence (AI) is the study of how computers perform tasks better than humans. Topics (2016) stated that it is a technical science that expands and develops research to establish theories, methodologies, technology, and application systems by emulating human intellect. In a nutshell, it is an electronic system that uses technology to convert human

wisdom into useful work. the use of artificial intelligence techniques. As a result, there exist systems that behave and reason rationally like people. According to Chukwudi et al. (2018), artificial intelligence is the capacity of a machine to carry out tasks that are typically handled by the human brain. Specifically, this refers to the capacity to learn, acquire, and carry out various duties, such as making decisions, appreciating relationships, and coming up with original ideas.

As for the focus areas for applying artificial intelligence technology in auditing, Hasan (2021) explained that the application areas most mentioned based on what literature review covered There are numerous examples including expert systems (ES), continuous auditing, decision support systems, neural networks (NN), deep learning, and machine learning, natural language processing (NLP), fuzzy logic, robotic process automation (RPA), and hybrid systems.

## **2.2. The effects of digital transformation using artificial intelligence technology on auditing.**

Auditing in general and internal audit in particular is one of the most important governance mechanisms as it plays an important role in ensuring the reliability and suitability of financial reports. With digital transformation, auditing has entered a new era of development. Through the contribution of digital transformation in enhancing and developing the audit process. As it represents a challenge to achieve quality in auditing. An audit is of high quality when it is conducted in an environment characterized by appropriate and supportive requirements among the relevant stakeholders in the financial reporting chain (International Auditing Standards Board, 2014). The International Auditing Standards Board (2014) framework emphasized the importance of information systems and technological systems applied in auditing. Audit software can help auditors conduct audit reports that lead to efficiency and enhance audit operations by achieving quality.

Artificial intelligence (AI)-based technology is essential for the future of the auditing sector. These technological advancements are crucial instruments that allow auditors the means to increase the effectiveness and efficiency of their work. as a result of technical advancements, the auditing profession has undergone tremendous change throughout time. In this field, several changes have been made. It entails a rise in the quantity and complexity of audit rules, numerous modifications to professional standards and ethics, an improvement in the caliber of audit work, an upsurge in audit firm competition, a decrease in audit fees, and the provision of new services to clients (such as financial and technological advice). Within the profession, new audit types and services have also been introduced. The interaction of these elements has heightened rivalry in the auditing sector. As a result, auditors frequently use modern methods and tools that IT and AI have made possible. For the auditor's decision-making process to be facilitated and sped up, they offer pertinent and timely information. Thus, it improves auditing efficiency and quality. The definition of a financial audit is “the activity carried out by a skilled and independent person to analyze financial and economic information extracted from accounting documents that have been examined using the associated auditing and verification methods.” This activity's objective is to publish a report outlining the auditor's assessment of the accuracy of the data so that a third party can recognize and use it. And on a large scale. It includes almost every audit engagement where judgment is required by the audit professional (Al-Sayyed et al. 2021).

The auditing profession relies heavily on accounting information Due to this feature, the accounting sector is a key application area for artificial intelligence. The correctness of the accounting reports is increased by AI's first entry booking efficiency and the removal of human error. Audit tasks necessitate decision making, sample selection, and evaluation. In general, In audit phases when rule-based tasks must be completed, especially time-consuming ones, AI may be helpful. The 1980s saw the first attempts to apply artificial intelligence to accounting and auditing. Abdul Mohammadi specifically

referred to the applications of decision support systems and knowledge-based expert systems, both of which increase the effectiveness of audit decision-making. The research conducted by Borthick & West (1987) was likewise based on expert systems. According to the authors, expert systems help auditors "plan audits, collect and evaluate evidence, and form opinions," which increases auditing's efficacy and efficiency. According to Zemankova (2019), artificial intelligence is initially capable of suggesting a level of relative importance, evaluating the efficiency of internal audits, and determining whether reserves or allocation amounts are adequate. One factor affecting the quality of audits is the time and effort required to carry out audit services. Using artificial intelligence to carry out audit duties can help to cut down on these requirements. In order to use electronic technologies and their applications in electronic auditing, employees must possess a high level of scientific and practical credentials. Auditing tasks must be accomplished objectively, and qualified auditors must use artificial intelligence to achieve objectivity in the process of investigation, evaluation of financial reports, and analysis of the data. Additionally, it succeeds in achieving objectivity and impartiality in the auditing of financial reports as well as in identifying fundamental mistakes and financial statement distortions. (Al-Ratami, 2012; Al Sammarraee and Al-Shareeda, 2020). (Saad, 2022) is quoted. and from the above we find that this serves as an impetus for research in this field and investigation into the extent of using artificial intelligence technology to enhance the auditing process.

In order to forecast future trends in research and software development in the region in light of their unique benefits and drawbacks, Omoteso (2012) looked into the use of artificial intelligence in auditing by reviewing prior studies on auditors' use of AI systems. It also analyzes earlier studies on the applications of neural networks and expert systems to auditing and their effects. The effectiveness of audit committees, the design and monitoring of internal control systems, and the consequences of employing such systems for small and medium-sized audit companies are all evaluated in this study.

Operations and survival, educational auditing, auditing of public sector organizations, independence of the auditor, auditing standards, and performance gaps.

On the other hand, (Anbar and Muhammad, 2016) revealed their research on audit quality according to applied artificial intelligence research on the Federal Financial Supervision Bureau. The use of artificial intelligence technology will help the success of the auditing profession and increase its quality by implementing it at different stages of the auditing process.

Kokina and Davenport (2017) reviewed the development of artificial intelligence in accounting and auditing, as well as how automation is transforming the field. They were interested in learning what cognitive technologies can currently achieve and how they will affect both human auditors and the auditing process as a whole in the future. Additionally, it gave instances of how the Big Four accounting firms had used AI. They presented the results, explored the implications for future research, and discussed several conceivable biases related to the development and application of artificial intelligence.

As for (Ukpong, et al., 2019), their study aimed to clarify the nature of accounting and auditing issues as well as the necessity of using artificial intelligence (AI) techniques, with a focus on current accounting concerns that require the successful development of new artificial intelligence, particularly auditing. This study was conducted using stakeholders, such as CEOs of banks and universities in Nigeria. Their study concluded with the future roles of banks and the effects that artificial intelligence can have on auditing systems.

Hasan (2021) touched on the use of artificial intelligence technology in accounting and auditing by reviewing the most important literature review that dealt with this technology, as evidenced by its findings in light of studies on artificial intelligence in accounting and auditing. Increased efficiency, productivity, and accuracy are anticipated to result from

the greater use of AI in the accounting and auditing professions, but there will also be costs associated with income problems, wealth inequalities, the abolition of traditional occupations, and an untrained workforce. By tackling this paradigm shift and preparing students, policies, and future professionals for the difficulties of a world filled with big data, blockchain technology, artificial intelligence, and other technologies, it is necessary to train educators, regulators, and professional organizations. The accounting curricula must also be revised by academics. Professional organizations must also revamp their training and professional development programs. The development and implementation of artificial intelligence in accounting and auditing professions can be considered a double-edged sword.

As for Al-Sayyid et al. (2021) The aim of their study was to examine how artificial intelligence technologies affect audit evidence from the perspective of certified auditors working in Jordanian IT companies. Their results showed that the use of the expert system significantly affected the audit evidence, and that the audit evidence is not significantly affected by neural network technology.

As artificial intelligence has evolved to serve society in all fields, deal with complex audit operations, improve audit performance, and enhance the abilities and competencies of practitioners, Saad (2022) investigated the role of artificial intelligence techniques in achieving audit quality by assessing the impact of AI on the auditing profession. in the field of auditing. This study examines how utilizing artificial intelligence can enhance the standard of professional audit performance, capability to carry out more complicated audit activities, and audit efficiency. The findings of a field study conducted in Palestine revealed a strong and favorable correlation between the use of artificial intelligence and raising the standard of professional audit performance. The use of artificial intelligence and capacity to carry out a complex audit procedure are significantly positively



correlated. In addition, there is a considerable beneficial association between AI applications of Artificial intelligence and enhancing audit efficiency.

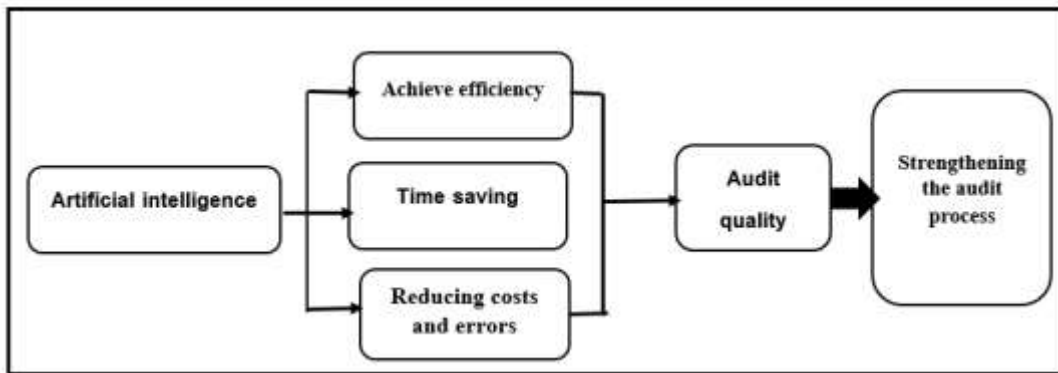
Fedyk et al. (2022) sought to understand how artificial intelligence (AI) affects the effectiveness and quality of auditing. Their findings demonstrate that although the effects on employment take time to materialize, investing in AI helps to raise audit quality, lower costs, and ultimately replace human auditors. In-depth interviews with 17 auditors working for the eight largest public accounting firms in the United States are used to support their empirical study, which demonstrates that the primary objective of employing AI in auditing is to increase quality, followed by efficiency.

Rikhardsson et al. (2022) discussed the relationship between artificial intelligence and auditing in small and medium-sized businesses, the study's objective was to find out what auditors, who primarily audit small and medium-sized businesses, believe artificial intelligence will do to the auditing profession and the auditing industry as a whole. They believe they will be most beneficial to the SMEs they audit. Their conclusions showed that these auditors expect considerable gains in their work efficiency, that they will find it easy to learn how to utilize AI applications, and that AI use in auditing companies will eventually become necessary. They believed that the use of artificial intelligence will enhance certain tasks' performance.

As artificial intelligence has evolved to serve society in all fields, Saad (2022) investigated the role of artificial intelligence techniques in achieving audit quality by evaluating the impact of technology on the auditing profession. These techniques address complex audit operations, improve audit performance, and increase practitioners' skills and competencies. in the field of auditing. This study examines how utilizing artificial intelligence can enhance the standard of professional audit performance, the capability to carry out more complicated audit activities, and audit efficiency. The results of a field study carried out in Palestine show that there is a high and positive association between

the use of artificial intelligence and improving professional audit performance. Our ability to complete difficult audit processes is greatly and favorably impacted by the deployment of artificial intelligence. Increased audit efficiency and the use of artificial intelligence are also strongly and favorably associated. Below is a figure that shows a summary of what has been discussed

**Figure (1):** Summary of the theoretical framework and Literature review



*Reference: was prepared by researchers based on Literature review*

### 3. Present-day trends and opportunities for artificial intelligence in auditing

The potential and trends brought about by the employment of AI technology have been explained in the literature review. According to Kokina and Davenport (2017), auditing is especially well-suited for applications that use data analysis and artificial intelligence. Companies may utilize artificial intelligence to improve internal operations, provide services such as auditing and fraud detection, and consult with customers. Artificial intelligence is used to help improve the audit process's accuracy and effectiveness, as well as to identify potential issues in a company's financial reporting and potential bookkeeping fraud. 2019 (Kaplan & Haenlein) In addition, technology has helped to raise the caliber of audits. Artificial intelligence contributed to the timely, accurate, and thorough completion of the audit procedure. (Aduloju et al. 2014)

Based on (Moffitt et al., 2018), the creation of automatic entries using artificial intelligence can occasionally detect fraudulent intrusions to minimize human participation and help reduce human errors. In addition, technology has helped to raise the standard of auditing. According to Aduloju et al. (2014), artificial intelligence contributed to the timely, accurate, and thorough completion of the audit process.

Many audit procedures that once needed manual labor—including data input procedures—are now enabled by artificial intelligence, claim (Raji & Buolamwini 2019). Unlike human auditors, AI systems are capable of writing scripts, creating audit tests, and reviewing all data. Artificial intelligence is transforming the auditing process in a number of ways, including computerized analysis of accounting records. When employing AI to generate automated entries, minimizing human mistake is advantageous. AI has the ability to both identify fraudulent entries and minimize human involvement (Moffitt et al. 2018).

#### **4. Threats resulting from the use of artificial intelligence technology in auditing**

Opportunities and potential don't just materialize when AI technology is used. Unless the regulatory environment poses a substantial number of risks and difficulties related to the use of artificial intelligence in auditing. According to the auditing firm Deloitte, there are different regulations for cloud-based services around the world, including tighter regulations in Europe. As a result, businesses in nations with laxer laws and regulations have more options for creating AI technology. Personal and financial information also presents a significant challenge. There are regulations that set limits on the gathering, sending, and storing of reports and personal information. On the other side, people can better manage the company utilizing their reports. Financial reports must be shared with third parties upon a customer's request, per Deloitte, who claims that this is required under European law. According to Clifford (2018), there are general risks associated with artificial intelligence that are widely publicized, such as the potential to reduce the

demand for labor across the economy or to cause income inequality as a result of a particular concentration of market power in the sector. A governing agency is required to regulate the development of artificial intelligence, according to billionaire technology entrepreneur Elon Musk, who has also suggested that it may be more deadly than nuclear weapons. One of the well-known scientists, Similar warnings were made by Stephen Hawking concerning the perils of artificial intelligence, which he warned may bring about the extinction of humanity by restricting human intelligence. Most often, algorithms are employed in auditing to identify risk. The General Data Protection Regulation (GDPR) of the EU mandates that businesses be able to defend the findings reached by their algorithms. Additionally, algorithms must be investigated to demonstrate that they do not engage in fraud, deception, internal bias, or human logical mistakes or biases. This need must be taken into consideration by the algorithms used in the audit for the outputs to continue to provide an accurate and balanced representation of reality. Zemankova (2019) asserts that biased algorithms may be used to make decisions that cause financial loss and damage the reputation of investors and business owners.

According to (Chassignol et al. 2018), artificial intelligence has the potential to jeopardize the security of financial reporting. As AI becomes more adept at identifying trends in data, it may be able to identify sensitive information that shouldn't be disclosed to outsiders. The misuse of this information may result in fraud or other illegal activities involving financial institutions.

## **5. Conclusions and recommendations**

Based on the information found in the literature review and research, artificial intelligence technology in auditing has a great deal of potential to increase productivity, decrease costs and human errors, and give auditors more time to focus on more complex, value-added tasks. All of these possibilities and advantages can improve auditing quality and grow a company's consumer base. Despite the benefits and opportunities resulting

from the use of this technology, on the other hand, there are many threats that have emerged, and based on what was discussed in our study, the most important of them are the restrictions imposed on countries whose companies apply this technology, reducing the number of workers in those companies, in addition to that It poses a security threat to the content of financial reports, as sensitive information that should not be disclosed to a third party can be hidden, and this encourages the commission of fraud and manipulation in the company. In conclusion, the researchers recommend that more studies be conducted to stimulate the use of this technology, not only with regard to enhancing the auditing process by achieving quality in auditing, but also with regard to various auditing processes. Although researchers expect more threats and risks to be presented in the future, this will bring more benefits, opportunities, possible innovations, and effective solutions.

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