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RESEARCH ARTICLE

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON AUDIT QUALITY "A FIELD STUDY ON AUDIT FIRMS IN EGYPT"

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ABSTRACT

The main objective of this research is to study the impact of Artificial intelligence on Audit quality. To achieve this objective, the researchers collected literature review about research variables. A field study was conducted on audit firms in Egypt. Data collected through structured questionnaire distributed. The completed respondents are 391 from 400 respondents and data were tabulated and presented using statistical tools such as correlation coefficient, regression and ANOVA analysis by using SPSS program. The research results showed that there is a positive weak correlation between artificial intelligence and audit quality with significant impact. As well as Using AI to improve audit quality, through helping auditors to find errors and issues of financial reports faster. However, the potential of using AI is significantly decrease the need for human auditors.

INTRODUCTION

Artificial intelligence is a substitute for human intelligence it is made through equipment and software together to solve complex business problems using reasoning, learning, elucidating and recognizing same steps same as human expert. AI has expert system instead of expert human and apply machine intelligence instead of human intelligence. Artificial intelligence helps managers in making decisions by providing more precise information, simplifying complex decision factors (Askary et al., 2018, P.332). It is an emerging technology, and it aims to mimic the human judgments and cognitive skills, with competitive advantages for adopters (Munoko et al., 2020, P.1). Also, We can define artificial intelligence as the intelligence exhibited by machines. In computer science, an ideal "Intelligent" machine is a flexible rational agent that perceives its environment and takes actions that increases its chances of success in achieving a goal (Adiloglu et al., 2019, P.2). The Organization for Economic Co-operation and Development (OECD) defines artificial intelligence (AI) as a machine-based system that can make predictions, suggestions, or judgments influencing actual or virtual environments for a certain set of human-specified

objectives (Noordin, N. A., et al., 2022, P.1). The usefulness of artificial intelligence is very important concept nowadays in the business and Academic practice. The introduction of the revolution of technology makes changes such as reorganization of industries. Businesses, governments, organizations, and individual's operations are reshaped through artificial intelligence (Issa, H., et al., 2016, P.1). AI is a powerful technology that can improve on cyber-security by preventing new attacks using autonomous systems and learning patterns. There are two most cited definitions for the audit quality, DeAngelo who defines as audit quality as the joint probability that auditors both discover a breach in the client's accounting system and report the breach, and DeFond and Zhang who define higher audit quality as greater assurance of high financial reporting quality (Rajgopal, S., et al., 2021, P.2). Researchers suggest that audit quality is defined as the probability that the auditor will detect a breach and report it. If auditors do not remain independent, they will be less likely to report irregularities, thereby impairing audit quality (Tepalagul, N., & Lin, L. 2015, P.3). Audits are of higher quality at the input level when the people implementing audit tests are competent and independent, and when the testing procedures used can produce reliable and

relevant evidence. The quality of audit inputs flows through to the audit process, where audits are of higher quality when the engagement team personnel make good decisions regarding the specific tests to be implemented and appropriately evaluate the evidence from these tests in leading to the audit report (Francis, 2011, P.2). We are examining the impact of AI on audit Quality in Egyptian audit firms. Trying to found that using of AI as a substitute for human intelligence affects Audit process, information risk and assurance of financial reporting.

Literature Review and Hypotheses Development: Literature review divided into three dimensions. The first dimension is about Artificial Intelligence how it works and how it affects firms. The second dimension is about Audit Quality frame work and the third one about effect of AI on Audit Quality.

LITERATURE REVIEW

Artificial Intelligence (AI)

Artificial intelligence is defined as a branch of science and computer engineering concerned with the development of intelligent machines or computers capable of thinking, learning, and working independently. Artificial intelligence helps to analyze large amounts of data, recognize patterns, and make decisions on its own. There are numerous ways to use AI in Organizations. It can smooth the process of data analysis and the review of documents to help with the decision-making process. In addition, AI can be used to create specific customized reports that meet the organization's needs (Nora Azima Noordin, *et al.*, 2022, P.3). The Organization for Economic Co-operation and Development (OECD) defines Artificial Intelligence (AI) as a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments. What separates AI from older data analytics techniques is that AI can copy highly non-linear interrelationships in the data and operation both large volumes of data and unstructured data such as texts and images.

AI algorithms can complement other recent technologies, which determine data that can be inspected by AI (e.g., images from drones) or specific applications for AI algorithms (e.g., robotic process automation) (Anastassia Fedyk, *et al.*, July 2022, P.7) According to (Dheeriyaa, P., &Singhvi, M., 2021, P.7) AI can easily be used in basic missions such as information retrieval from contracts, leases, and invoices. According to the National Association of corporate directors, directors rate AI as the biggest technology disruptors *yet also* regard it as the biggest business enabler likely to aid their organizations in the next 12 months. Given current advances in AI and machine learning, it should be obvious that an AI-based application can perform the work of Audit Committees members. (Azima, *et al.*, 2022). Suggested that if organizations prefer using AI in their businesses they should not neglect potential threats caused by AI on financial data. As AI becomes more proficient in identifying data patterns, it may also be able to identify sensitive information that should not be disclosed to outsiders.

If this information fell into the wrong hands, it could be used to manipulate financial institutions or to commit other crimes. In the light of previous articles, the researchers can conclude that Artificial Intelligence innovatively works with the internal controls systems to help managers to produce high-quality accounting information by reducing accounting information risk. It can be applied in developing and designing internal control system to produce reliable accounting information.

Audit Quality: For instance, the legal view of auditing provides two types of audit quality that contrast each other: "audit failure" and "non-audit failure". An audit failure happens in the case of lack of auditor independence, or if the auditor independence is present, but the auditor incorrectly issues an unqualified audit report due to failure to accumulate sufficient competent evidence as necessitated by auditing standards. On the other hand, a "good audit" or a non-failure audit is one in which the auditor complies with auditing standards and issues the accurate opinion about the client's financial statements at a reasonable level of audit risk (Francis, J. R., 2011, P.3). Another Common definition of Audit Quality is that it is a process that an auditor goes through to evaluate a financial statement's risk level of a material misstatement. In other words an auditor inspects whether a financial statement has been fairly documented to ensure that there are no material misstatements and to ensure a strong internal control. In these conditions auditor's independence is a critical point when reporting errors or fraud.

Find and report material errors, depends on different factors related to auditors' competencies. Training and experience prepare the auditor for the discovery of material misstatements. Moreover, independence would be the circumstance to report what has been discovered (Hosseinniakani *et al.*, 2014, P.2). Actual quality and perceived quality have been presented as important issues in audit quality definition. Actual audit quality can be defined as the probability of reducing the risk of reporting a material misstatement in the financial statement. While perceived quality is the perspective of financial statement users about auditor's ability to reduce the material misstatements. In this instance, Greater perceived audit quality can lead to improvements in audited clients' investment processes. In terms of achieving reasonable assurance, it can be said that audit quality refers to how well the auditing process can identify and report material inaccuracies in the financial statements (Hosseinniakani, S. M., *et al.*, 2014, P.2).

Effect of AI on Audit Quality: (Albawwat, I.2021) explained the perceived ease of use, usefulness, and contribution to the audit quality of different AI's types. The results indicate that auditors perceive Assisted and Augmented AI systems as ease of use in auditing while perceiving Autonomous AI systems as complicated to use. (Fedyk, A.2021) investigated the impact of A.I (Artificial Intelligence) on audit quality and efficiency for largest audit firms to identify audit firms' employment of AI workers and what is the performance of these workers. The results showed that AI helps to improve audit quality reduces fees, and ultimately displaces human auditors. (Yebi, D. K.2022) examined impact of AI on auditors' skills and competencies, audit process and audit quality.

Table 1. Definition of research variables

Hypotheses	Independent variable	Dependent variable	Measurement
H1: There is significant impact of Artificial Intelligence on Audit Quality	Artificial intelligence	Audit quality	Questionnaire

Table 2. Descriptive analysis Artificial Intelligence

Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1- Artificial intelligence is a substitute for human intelligence.	3.6%	15.5%	17.9%	48.8%	14.3%
2- Artificial intelligence is used because of the increasing human errors.	17.9%	46.4%	10.7%	16.7%	8.3%
3- Artificial intelligence helps to analyze large amounts of data, recognize patterns, and make decisions on its own.	29.8%	41.7%	10.7%	15.5%	2.4%
4- Artificial intelligence can smooth the process of data analysis and the review of documents to help with the decision-making process.	51.2%	44.0%	2.4%	1.2%	1.2%
5- AI can be used to create specific customized reports that meet the organization's needs.	34.5%	54.8%	7.1%	0%	3.6%
6- Artificial intelligence is revolutionizing the auditing process	35.7%	44.0%	10.7%	9.5%	0%
7- Artificial intelligence is mainly used to help auditors identify data patterns and make predictions and decisions.	32.1%	50.0%	10.7%	4.8%	2.4%

Table 3. Descriptive Statistics for Artificial Intelligence

Statements	Mean	St. Deviation
1- Artificial intelligence is a substitute for human intelligence.	2.4524	1.03441
2- Artificial intelligence is used because of the increasing human errors.	3.4881	1.20735
3- Artificial intelligence helps to analyze large amounts of data, recognize patterns, and make decisions on its own.	3.8095	1.10286
4- Artificial intelligence can smooth the process of data analysis and the review of documents to help with the decision-making process.	4.4286	.71618
5- AI can be used to create specific customized reports that meet the organization's needs	4.2024	.72444
6- Artificial intelligence is revolutionizing auditing process	4.0595	.92295
7- Artificial intelligence is mainly used to help auditors identify data patterns and make predictions and decisions.	4.0476	.91710

Table 4. Descriptive analysis Audit Quality

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1- The audit quality is the probability of the auditor detecting a breach and report it.	31.0%	54.8%	6.0%	6.0%	2.4%
2- Competent and independent auditors produce high quality audit.	42.9%	45.2%	10.7%	1.2%	0%
3- The Artificial Intelligence improves the audit quality.	41.7%	51.2%	6.0%	1.2%	0%
4- Artificial intelligence is associated with lower audit fees.	13.1%	41.7%	27.4%	16.7%	1.2%
5- AI software enables auditors to make judgments about which areas need the most scrutiny.	27.4%	54.8%	14.3%	3.6%	0%
6- Investors and regulators alike expects auditors to be experts in technology.	17.9%	56.0%	17.9%	7.1%	1.2%
7- Security auditors should have degrees in computer science, information technology, or a related field.	35.7%	36.9%	17.9%	8.3%	1.2%
8- Internal control weakness causes an increased audit risk.	57.1%	34.5%	3.6%	3.6%	1.2%
9- An auditor inspects whether a financial statement has been fairly documented to ensure that there are no material misstatements and to ensure a strong internal control.	47.6%	42.9%	7.1%	1.2%	1.2%
10- In the presence of internal control deficiency, auditors may increase their sufficient testing to maintain similar levels of audit quality.	32.1%	56.0%	10.7%	1.2%	0%

Table 5. Descriptive Statistics of Audit Quality

	Mean	St. Deviation
1- The audit quality is the probability of the auditor detecting a breach and report it.	4.0595	.90980
2- Competent and independent auditors produce high quality audit.	4.2976	.70761
3- The Artificial Intelligence improves the audit quality.	4.3333	.64627
4- Artificial intelligence is associated with lower audit fees.	3.4881	.96310
5- AI software enables auditors to make judgments about which areas need the most scrutiny.	4.0595	.75012
6- Investors and regulators alike expects auditors to be experts in technology.	3.8214	.85250
7- Security auditors should have degrees in computer science, information technology, or a related field.	3.9762	.99367
8- Internal control weakness causes an increased audit risk.	4.4286	.82558
9- An auditor inspects whether a financial statement has been fairly documented to ensure that there are no material misstatements and to ensure a strong internal control.	4.3452	.76826
10- In the presence of internal control deficiency, auditors may increase their sufficient testing to maintain similar levels of audit quality.	4.1905	.66724

Table 6. Correlations

		Artificial intelligence	Audit quality
Artificial intelligence	Pearson Correlation	1	.440**
	Sig. (2-tailed)		.000
	N	84	84
Audit quality	Pearson Correlation	.440**	1
	Sig. (2-tailed)	.000	
	N	84	84

** . Correlation is significant at the 0.01 level (2-tailed).

Table 7.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.440 ^a	.193	.184	.39698

a. Predictors: (Constant), Artificial intelligence

Table 8. ANOVA table

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.097	1	3.097	19.654	.000 ^b
	Residual	12.923	82	.158		
	Total	16.020	83			

a. Dependent Variable: Audit quality

b. Predictors: (Constant), Artificial intelligence

Results showed that AI has had a significant impact on auditors' skills and competencies, with many respondents affirming that the core skills now needed by auditors is IT skills. Audit process and audit quality have also been positively affected by AI. (Noordin, N. A.2022) presented external auditors' perception of the use of artificial intelligence (AI) in different audit firms located in the United Arab Emirates (UAE). The results showed that there is a non-significant difference in the perceived contribution of AI to audit quality between local and international audit firms. All the audit firms, whether local or international, have equal perceived contributions about the audit quality. (Albitar, K., et al., 2020, P.2) mentioned that using Cyber-security and AI are improving the internal control by protecting information from threats on the internet. AI reduces human errors, increases accuracy, and protects firms against unknown threats and learns its patterns while Cyber Security protects firms' information against known cyber threats. Audit quality gives a guide for auditors on the things that should be regarded in relation to the effect of social distancing measures on audit quality. According to previous mentioned articles, Researchers can conclude that AI is mainly used to help auditors identify data patterns and make predictions and decisions. AI is revolutionizing the auditing process and AI enabled auditing software can carry out complex audit much more efficiently, effectively, and accurately than humans is able to.

HYPOTHESES DEVELOPMENT

H1: There is significant impact of Artificial Intelligence on Audit Quality

METHODOLOGY

Data collected through structured questionnaire distributed on auditors in audit firms in Egypt. The questionnaire distributed through Google forms and personal meetings. The completed respondents are 391 from 400 respondents which mean there are 9 incompletes.

Data collected were synthesized and analyzed to give meaning to the specific objective of the research. The data were tabulated and presented using such statistical tools as correlation coefficient and regression analysis by using SPSS program. The questionnaire includes two sections; the first includes statements about Artificial Intelligence and the second includes statements about Audit Quality.

RESEARCH VARIABLES

Descriptive analysis: The statement which most respondent agreed on is the following: "AI can be used to create specific customized reports that meet the organization's needs." By 54.8%, "Artificial intelligence is mainly used to help auditors identify data patterns and make predictions and decisions." By 50.0%, and the following statement "Artificial intelligence is used because of the increasing human errors." By 46.4%. While most responses are Disagree on the following statement "Artificial intelligence is a substitute for human intelligence." By 48.8%. One of the best statements in the Artificial Intelligence that most people strongly agreed upon is "Artificial intelligence can smooth the process of data analysis and the review of documents to help with the decision-making process." By 51.4%. The highest mean is (4.4286) in the following statement: "Artificial intelligence can smooth the process of data analysis and the review of documents to help with the decision-making process.", and this refer to most of the answers is going to the agreement.

The standard deviation (0.71618) the standard deviation is less than 1, which means that there is valid homogeneity between opinions and that the variances in opinions and circulation is narrow. The lowest mean (2.4524) in "Artificial intelligence is a substitute for human intelligence." this refer to most of the answers is going to the agreement and the standard deviation (1.03441) The standard deviation is greater than 1, which means that there is valid heterogeneity between opinions and that the variances in opinions and circulation is wide. The statement which most respondents agreed on is the following:

“Investors and regulators alike expect auditors to be experts in technology.” By 56%, and both “audit quality is the probability of the auditor detecting a breach and report it.”, and “AI software enables auditors to make judgments about which areas need the most scrutiny.” By 54.8%. The respondents made a neutral response on the following statement: “Artificial intelligence is associated with lower audit fees.” By 27.4%

The highest mean is (4.4286) in the following statement: “Internal control weakness causes an increased audit risk.” and this refer to most of the answers is going to the agreement and the standard deviation (0.82558) The standard deviation is less than 1, which means that there is valid homogeneity between opinions and that the variances in opinions and circulation is narrow. The lowest mean is (3.4881) in the following statement: “Artificial intelligence is associated with lower audit fees.” and this refer to most of the answers is going to the agreement and the standard deviation (0.96310) The standard deviation is smaller than 1, which means that there is valid homogeneity between opinions and that the variances in opinions and circulation is narrow.

REGRESSION ANALYSIS

H1: There is significant impact of Artificial Intelligence on Audit Quality

There is a positive weak correlation between artificial intelligence and audit quality and that correlation is significant. From the previous table the correlation coefficient between impact of Artificial Intelligence on the Audit Quality= 0.440 which means positive weak correlation with significant level =0, which also means we will accept the first hypothesis stated that there is a relationship between Artificial Intelligence and the Audit Quality. From the previous regression table, the (F) test value is big for me which means its value with significant is 0.000 less than 0.05 which mean the regression analysis support correlation analysis there is a significant impact between Artificial Intelligence and Audit Quality.

RESEARCH RESULTS

According to the test hypotheses, there is a positive weak correlation between artificial intelligence and audit quality with significant impact. As well as Using AI to improve audit quality, through helping auditors to find errors and issues of financial reports faster. However the potential of using AI is significantly decrease the need for human auditors. AI has the ability to greatly improve audit quality, but its deployment needs to be closely monitored to prevent any early problems. With appropriate training, data, and governance, AI can enhance the efficiency and effectiveness of audits, leading to more accurate and reliable financial reporting.

RESEARCH SUMMARY AND RECOMMENDATIONS

The main objective of this research is to study the impact of Artificial Intelligence on audit quality. We have collected literature reviews about the variables. Data collected through structured questionnaire distributed on auditors in audit firms in Egyptian audit firms. The data were tabulated and presented using such statistical tools as correlation coefficient

and regression and ANOVA analysis by using SPSS program. According to the test hypotheses, there is a positive weak correlation between artificial intelligence and audit quality with significant impact. Using AI to improve audit quality through helping auditors to find errors and issues of financial reports faster. However, the potential of using AI is significantly decrease the need for human auditors. The research highlights and opens the door for future research about AI impact on financial reporting quality Audit risk and fraud detection.

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