The Impact of Deep and Machine Learning on Financial Reports Quality and it's Reflective on Decisions Making

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Abstract

Purpose: Aims this sthey to measure the impact of Artificial Intelligence (AI) on the financial reports quality (FRQ) and its reflection on Decision Makers (DM).Design/methodology/approach: we adopted the descriptive analytical approach The study tool used the questionnaire, which was distributed to a sample of mainly accountants, as well as several programmers, and 121 responses were obtained, and the statistical program was used to analyze the results and test hypotheses. Smart-PlsFindings: The results of the study showed that there is a positive effect of AI represented by Machine Learning (ML) and Deep Learning (DL) on the FRQ and DM, as well as there is a positive effect of the FRQ on DM.Research, Practical & Social implications: with the expansion of the economic requirements of society, in addition to the rapid development of information technology, including the development of AI and the prosperity it brought about in several areas, including computer science, engineering and medicine, which provided a good opportunity For accountants in employing AI technology in order to raise the FRQ,Originality/value: the technology has become necessary to be applied in the field of accounting, because this will lead to important changes in the accounting industry and its development.

Keywords: *artificial intelligence, financial reports quality, Decision Makers.*

Introduction

Investment decisions are of great importance to the economic institution, as they determine the survival or growth of the economic institution. Financial economics theories have shown that the lack of asymmetry in information between the company and external parties leads to inefficiency in investment decisions. The reason for this is that the asymmetry of information and information accounting leads to distortions in the market, and thus the company's inability to achieve the optimal level (Al-Janabi et al., 2023; Kim et al., 2023). Financial report financially transaction carried out by the company issuing the financial reports, which controls its preparation and submission to various users, who in turn use these reports to improve their decisions (Ali et al., 2023; Setiyono, 2022). At the global level, wrong financial reporting is common, as indicated by the PricewaterhouseCoopers study. That is, 49% of financial reports lack quality (Kaawaase et al., 2021; Fauzan, 2022). The beginning of the emergence of (AI) in the program "Logic Theorist" which was created by "Herbert Simon, Allen Newell, and John Shaw,". It is the cornerstone of its inception, and this program helped in the development of

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AI and prosperity in the world of technology that helped increase storage capacity in computers, and thus provided a good opportunity for accountants to employ these technologies to process a larger volume of data as part of their work, and therefore these technologies became very necessary (Giles, 2019; Markhaichuk & Panshin, 2022). With the expansion of the economic requirements of society, in addition to the rapid development of information technology, this necessitated the application of AI techniques in the field of accounting, because this will lead to important changes in the accounting industry and its development (Li et al., 2018; Zhou, 2022). Accounting is an important profession that is no less important than any other profession, such as medicine and the legal profession, because it has met all the requirements to be considered as such, and among the most important of these requirements is that it has a role in the welfare of society. For this reason, the profession Accounting should interact with the variables of its work environment and affect it because it will certainly be affected by it (Ali et al., 2023; Zakariya et al., 2023).

Redundancy and tiredness are traits of traditional accounting labor, but applying AI to the sector can address its flaws of inefficiency and low added value, which encourages accountants to engage in more innovative work and provide more value to the organization. According to Luo et al. (2018), applying AI to the accounting sector will significantly improve firms' competitiveness while also fostering the sector's growth and innovation. One of the most important tasks that an accountant performs in accounting firms is the preparation of financial reports, as it represents a source of concern for DM represented by investors, shareholders, lenders, and others.

Where financial reports are a two-party transaction carried out by the company that issues the financial reports, which controls their preparation and submission to various users, who in turn use these reports in the hope that they will help them improve their decisions (Al Naim & Jamil, 2023); Maseer et al., 2022).

Investment decisions are of great importance to the economic unit, as they determine the survival or growth of the economic unit. Long-term benefits may be achieved, or the future of the economic unit may be at risk (Al-taee & Flayyih, 2023;(Talha, 2022). Financial economics theories have been proposed that the lack of information asymmetry between the company and external parties leads to inefficiency in investment decisions. The reason for this is that information asymmetry results in distortions in the market, and thus the company's inability to achieve the optimal level (Zhai & Wang, 2016). At the global level, incorrect financial reporting is common, as the PricewaterhouseCoopers study indicated that 49% of financial reports lack quality (Kawaase et al., 2021; Faqir, 2023). Hence, the idea of research was evident as a result of the users' need for quality financial reports that help them make correct decisions (Abdulhussein et al., 2023). The need to use AI techniques to raise the FRQ emerged. In light of this, the importance of the study was represented in its scarcity, which in turn will contribute to explaining the importance of AI, which has become one of the contemporary and important topics in recent times, and its impact on producing quality reports and thus increasing the confidence of investors, because it meets their needs in decision-making (Hussein et al., 2023).

The research problem stems from several controversial issues in financial reports, such as accounting estimates, which are a major challenge for the compilers of financial reports, due to the uncertainty surrounding them, the volatility of financial markets, and administrative biases (Abass et al., 2023; Priambodo et al., 2022). Among these issues is also the asymmetry of information as This phenomenon leads to the market's inability to reach the real prices of securities, as the increase in the volatility of securities prices leads to a prevalence of anxiety

and lack of confidence in the market, and thus a decrease in trading volume and negatively affecting liquidity levels and investment efficiency (Hadi et al., 2023). On a global level, there are doubts about the quality and credibility of financial reports, and data users are not very sure of the reliability on which financial reports are prepared on the basis of which, due to the financial scandals that have been reported in some companies, the Arthur Andersen and Enron scandals have become a reference point for discontent Users over the years, and although this issue led to the emergence of the Sarbanes-Oxley Act in 2002, it did not solve the problem of public dissatisfaction and the inability of analysts to rely on corporate reports to conduct predictive analysis (Jimoh, 2022; Jasim, 2022).

Theoretical Framework and Literature Review

The Concept of Artificial Intelligence

Every human being is in a state of transformation to become a machine. Rather, it is more correct to say that it is the machine that is in the process of evolving into a human being. This was stated by the French philosopher (Paul Valery) in his famous books at the beginning of the nineteenth century. Where this saying was the beginning of an actual presentation of the problem related to the future of the machine in its coexistence with man, and therefore this question was recorded as the first question in the field of machine intelligence or what is known and the most common and used term Today is AI (Gamora et al., 2018). The word (Intelligence) means intelligence, and if we search for it in the dictionary of the English language, it means person's intelligence or ability to learn things. The ability to think and understand (devoid of the effect of instinct and spontaneity) (Negnevitsky, 2005; Cellan-Jones, 2014). In this context, AI is defined as the machine's ability to perform cognitive functions, represented by perception, learning, interaction and inference. The ability of a computer-controlled digital computer (lootah & Faccia, 2019; Ergen, 2019).

Machine Learning

ML is an integral part of AI and is so common that it is often confused with AI (Weber, 2020). It deals with data-driven learning improvement. Ultimately, it is about how much better tasks can be consistently solved by the machine, using training data and algorithms in particular. It should be noted how ML works. A device or program can learn to perform certain tasks if it has previously acquired experience in the form of relevant data. With this data and with each task completed, the machine gets more experienced - in other words, it's learning. In the past, the ability of a machine to solve a task was tied to the programmer's code. Today the machine learns on its own, for example, the machine shows pictures of animals including the name of the animal. After some time, the machine can decide for itself which animal appears in another image (Flayyih & Khiari, 2022) Algorithms in ML are divided into three categories Supervised Learning Supervised learning is the simplest learning paradigm. Learning in the supervised model involves creating a function that is trained using a training set and can then be applied to the new data (Al-taee & Flayyih, 2022). Where the goal is to predict the output value of a specific input value. Using this algorithm, a set of data is trained. There are two types of supervised learning algorithm (Aidi et al., 2023). classification and regression (Palanisamy, 2020). Unsupervised Learning Algorithm: In this algorithm, the output is predicted based on the similarity between the input vectors. This method is used when the data is not classified. Unsupervised learning includes two learning categories: grouping and association (Nikkeh et al., 2022). Reinforcement learning: It is the third category of ML where the computer program

learns directly from experiments, or it is an algorithm that learns behavior by observation and then adapting, receiving the result from its environment and continuously improving its future steps (Al-Jaber 2020).

Deep Learning

It is an in-depth form of ML; it is a method of creating AI. Unlike ML, humans no longer have to intervene here. It only provides information and data for learning, and the machine independently performs predictions and makes decisions. DL is a more complex algorithm that can perform communications with multi-layered networks. DL relies on very large amounts of data and the use of artificial neural networks (Url, 2022).

Artificial Intelligence and Financial Reports Quality

A study (Li & Zheng, 2018) indicated that AI works to change the traditional methods of accounting work, where when using AI techniques in accounting systems, it leads to handing over a large amount of accounting work to computers for the purpose of completing it, so the smart technologies in the accounting system settle invoices As well as preparing scales and automatically completing procedures and treatments, especially routine tasks that are more time-consuming (Talab & Flayyih, 2023).

ML: This technology helps the company to avoid the possibility of financial fraud, because these technologies cannot be tempted by force or money because they are linked to certain predetermined rules and act directly, as well as they can predict, explore and identify fraudulent activities easily. By creating sophisticated ML-based models, the audit process can also be transformed by DL, a form of AI that can analyze unstructured data such as emails, social media posts, and audio files of conference calls And synchronization with financial details In recognition of the enormous potential in AI, major accounting firms can benefit from it through the effective implementation of cognitive technologies and thus the audit process will become "smarter, richer, and more efficient. This is what users of financial statements deserve" (Ukpong, 2019). AI also contributes to raising the accuracy and efficiency of future forecasts. AI technologies play an essential role in creating a work environment that is more predictable and less risky, by using a number of algorithms that process a large amount of data in record time for the purpose of predicting the financial status of the project, where intelligence technologies help AI is used to make decisions, and some banks used these technologies to review customers and banking transactions for the purpose of deciding whether the company or individual is creditworthy or not. AI also works to reduce costs by transferring tasks from humans to AI, accelerating response time, and keeping humans Keep up to date with the latest organizational changes, and save time with reporting. Bank of New York Mellon Corp. has already developed and deployed hundreds of automated computer programs. These bots are built to perform repetitive tasks ranging from automated programs to respond to data requests from external auditors to systems that correct formatting and data errors in dollar fund transfer requests (Singapore, 2018). This also works to promote products. AI techniques help in designing promotional and marketing programs for products effectively by identifying appropriate messages to attract the consumer and determining the appropriate price by analyzing data on consumer preferences and the status of competitors (Hani et al., 2023) and finally studying Workers' needs AI techniques create a high value for user data, allowing the project to adapt to the customer's needs and preferences, thus enhancing their loyalty and increasing the marketing share and the company's revenue. For example, chatbots can provide customers with information needed for a product (Partanen, 2017)

Making Decisions

DM, they are those individuals or groups that carry out the various stages and steps of decision-making. The goals of the decision are the goals that the decision seeks to achieve (Gofwan, 2022). About the qualities of the decision-maker, one of the most important qualities that the decision-maker must possess is to have a holistic view, to have good experience in the subject matter of the decision, to be well-versed in the techniques and methods of decision-making, to be objective and realistic, to be bold in risky situations, and to be quick. Intuition in situations that require speed in decision-making, and finally be deliberate in situations that require in-depth analysis (Shams, 2009).
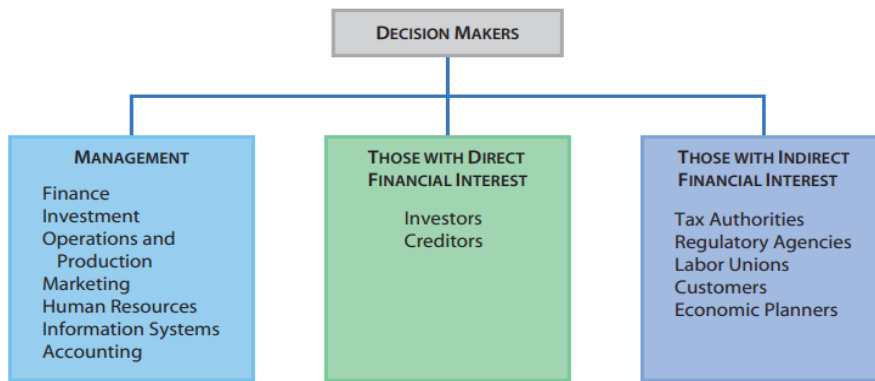

Figure 1. classification of DM
Sources: (Needles et al., 2013).

Intelligent Information and Decision Making

Information is the raw material from which decisions are made. Since there is a direct relationship between the quality of this raw material and the quality of the product represented in the decisions taken, and for this reason the availability of appropriate quantitative and qualitative information. And in due time. It is the basis for decision making. Where the ability to make successful decisions increases as the quality and adequacy of available information increases and the amount of accuracy in presenting and explaining the facts related to the phenomenon under study. Thus, providing appropriate information at the right time to the decision-maker would achieve many benefits (Al-Sarraj, 2018). Developing the ability of the DM to benefit from the available information as well as previous experiences. Rationalizing and coordinating the efforts of the decision-maker in research and development in the light of the available information. Ensure a broad knowledge base to solve problems. Provide alternatives and modern methods to solve problems and choices sufficient to reduce them in the future (Al-Refiay et al., 2022). Because it is currently relatively weak compared to what a strong AI will be in the future, AI is currently considered more as a support for important business decisions than as a DM. More and more data sets are being available to inform judgments as processing speed and power rise (Stone et al., 2020). The study (Duan, 2019) also showed that the new wave of AI is likely to improve the organization's ability to use data to make predictions and significantly reduce the cost of doing so. In addition, the study (Duan, 2019) showed that using AI will improve the decision-making process (Albderi et al., 2023).

Research Methodology

we are adopting on questionnaire was designed for the purpose of testing research hypotheses, and this consisted of three main axes: - The first axis included five dimensions dedicated to measuring AI, and each dimension included six questions, and the second axis included six questions measuring in their entirety. The FRQ, and the third axis also includes six questions that measure DM in their entirety. A seven-category scale was used to express the axes and dimensions above, in which the measurements range from one point with a content that strongly disagrees, and seven points with a content that strongly agrees.

Sample

We are distributing 121 of the 150 questionnaires that were issued were collected from the sample. The sample questionnaire respondents are described below.

Table (1) Distribution of sample members by sex

Category	Valid Percent	Frequency	Percent
Female	0.53	64	0.53
Male	0.47	57	0.47
Total	1.00	121	1.00

Source: Prepared by the authors (2023).

Table (1) above shows that 53% of the sample were females and 47% were males, and thus females represent the highest percentage. This is consistent with what was confirmed by feminist theory in that women are a category that cannot be ignored, as the Oxford dictionary defines feminist theory as "is the recognition of women's rights from The various levels of academic and practical life without excluding women from it". The percentages are close in the distribution of the questionnaire to males and females, and this indicates the achievement of gender balance among the sample members, which is important from the perspective of the research and its representation of the sample, as the closeness of the participation rate helps in obtaining balanced and comprehensive opinions, which increases the strength of the study.

Table (2) Distribution of sample members according to educational qualification

Category	Valid Percent	Percent	Frequency
Diploma	0.05	0.05	6
Bachelor	0.35	0.35	42
Master	0.47	0.47	57
Doctorate	0.13	0.13	16
Total	1.00	1.00	121

Source: Prepared by the authors (2023).

It is noted from Table (2) above that the participation rate of the master's class is high in filling out the questionnaire, and this reflects that this group paid more attention to the subject of the questionnaire and they have more motivation to participate and present their opinions, and this helps to give opinions based on awareness, experience and greater knowledge of the topics, as well as their being from Categories interested in recent research and studies.

Table (3) Distribution of sample members according to years of experience

Category	Valid Percent	Frequency	Percent
Less than 5 years	0.30	36	0.30
5-10 years	0.26	31	0.26
11-15 years	0.18	22	0.18
More than 15 years	0.26	32	0.26
Total	1.00	121	1.00

Source: Prepared by the authors (2023).

Table (3) above shows that the results are close to the response rates, in order to try to include all groups from different years of experience for the purpose of collecting different opinions and experiences to achieve comprehensiveness in the results and enhance diversity in order to contribute to enriching the analysis as well as reaching results that are comprehensive and accurate.

Table (4) Distribution of the individuals in the questionnaire sample according to scientific specialization

Category	Valid Percent	Frequency	Percent
Accounting	0.69	84	0.69
Auditing	0.11	13	0.11
Business	0.07	9	0.07
Information Technology	0.13	16	0.13
Total	1.00	121	1.00

Source: Prepared by the authors (2023).

Table (4) above shows that the distribution of the questionnaire for the most category is the accounting major, in addition to the auditing and business management specialization, due to their relevance to the subject of the research, especially the axes of the FRQ and DM. The computers specialization was also included and made them part of the questionnaire sample in order to obtain objective and accurate data regarding The first axis of AI and its impact on the quality of data and information.

Results and Discussion

Table (5) Results of testing the first sub-hypothesis.

Path	β	S.D (STDEV)	T statistics	Sig.
ML > FRQ	0.662	0.049	13.575	0.000

Source: Prepared by the authors (2023).

It is noted from Table (5) above that the P-Value amounted to 0.000, which is much less than the predetermined value of the accepted error in social sciences by 0.05, and therefore the first sub-hypothesis of the research is accepted.

The following table presents the value of each of the R^2, which shows the interpretation coefficient of the model, and the value of the F-square, which shows the effect of the independent variable.

Table (6): Explanation and influence coefficients for the first sub-hypothesis

Path	R^2	F-square
ML > FRQ	0.438	0.780

Source: Prepared by the authors (2023).

From the interruption of the R^2 value and the F-square value in Table (6) above with the explanations for these values, we find that ML explains 43.8% of the variation in the FRQ, and this explanation is average because the R^2 interpretation coefficient ranges between -0.19 0.67, and we also find that ML has a 78% impact on the FRQ, which is a significant impact because the F-square value was more than 0.35.

•The second sub-hypothesis: "The DL technique, as one of the AI techniques, has a positive effect on the FRQ". Table (7) presents the results of testing the first sub-hypothesis according to the outputs of the Smart-Pls programme.

Table (7) Results of testing the second sub-hypothesis

Path	β	S.D	T statistics	Sig.
DL > FRQ	0.822	0.018	44.537	0.000

Source: Prepared by the authors (2023).

It is noted from Table (7) above that the value of the P-Value amounted to 0.000, which is much less than the predetermined value of the accepted error in social sciences by 0.05, and therefore the second sub-hypothesis of the research is accepted.

Table (8) presents the value of each of the R^2, which shows the interpretation coefficient of the model, and the value of the F-square, which shows the effect of the independent variable.

Table (8) Explanation and influence coefficients for the second hypothesis

Path	R^2	F-square
DL > FRQ	0.676	2.082

Source: Prepared by the authors (2023).

From the interruption of the R2 value and the F-square value in Table (8) above with the explanations for these values, we find that DL explains 67.6% of the variation in the FRQ, and this explanation is significant because the R2 interpretation coefficient is greater than 0.67. We also find that DL affects the FRQ by 208.2%, which is a significant effect because the F-square value was more than 0.35.

The second main hypothesis "The FRQ positively affects DM"

Table (9) presents the results of testing the second main hypothesis according to the outputs of the Smart-Pls program

Table (9) Results of testing the second main hypothesis

Path	β	S.D	T statistics	Sig.
DM > the FRQ	0.690	0.046	15.032	0.000

Source: Prepared by the authors (2023).

It is noted from Table (9) above that the value of the P-Value amounted to 0.000, which is much less than the predetermined value of the accepted error in social sciences by 0.05, and therefore the second main research hypothesis is accepted.

Table (9) shows that the value of each of the R^2, which shows the interpretation coefficient of the model, and the value of the F-square, which shows the amount of influence of the independent variable

Table (10) Explanation and influence coefficients for the second main hypothesis

Path	R^2	F-square
DM > the FRQ	0.476	0.908

Source: Prepared by the authors (2023).

From the interruption of the R2 value and the F-square value in Table (10) above with the explanations for these values, we find that the quality of automated reports explains 47.6% of the variance in DM, and this explanation is considered average because the R^2 interpretation coefficient ranges between -0.19 0.67, and we also find that the FRQ affects DM by 90.8%, which is a significant effect because the F-square value was more than 0.35.

The third main hypothesis "AI positively affects DM.

The path shown in Figure (2) was formulated for the purpose of testing the hypothesis:
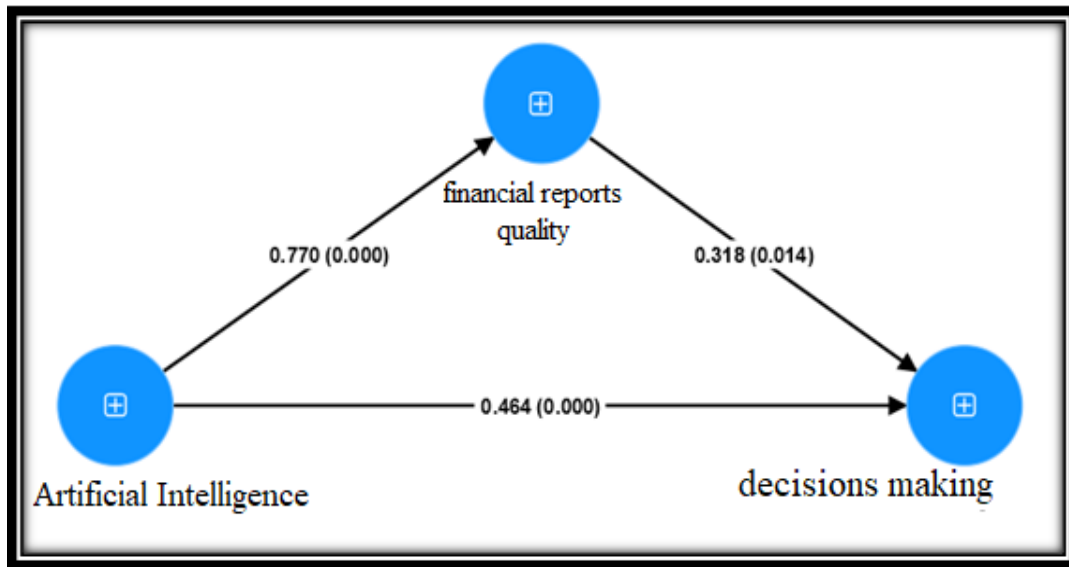

Figure (2) The course and results of testing the third main hypothesis.
Source: Prepared by the authors (2023).

Table (11) presents the results of testing the third hypothesis according to the outputs of the Smart-Pls program.

Table (11) results of testing the third main hypothesis

Path	β	S.D	T statistics	Sig.
DM > AI	0.464	0.132	3.508	0.000
DM >FRQ > AI	0.245	0.099	2.476	0.013

Source: Prepared by the authors (2023).

Table (11) above presents the results of the direct impact of AI on DM, as well as the indirect impact or through the mediating variable, the FRQ. It is noted from the above table that the P-value for both effects amounted to 0.000 and 0.013, respectively, which is much less than the predetermined value of the accepted error in social sciences by 0.05. AI in DM. Table (12) shows the value of each of the R^2, which shows the interpretation coefficient of the model, and the value of the F-square, which shows the amount of influence of the independent variable.

Table (12) Explanation and influence coefficients for the third main hypothesis

Path	R^2	F-square
DM > AI	0.544	0.192

Source: Prepared by the authors (2023).

And from the interruption of the R^2 value and the F-square value in Table (12) above with the explanations for these values, we find that AI explains 54.4% of the variance in DM, and this explanation is average because the R^2 interpretation coefficient is greater than It ranges between -0.19 0.67, and we also find that AI affects DM by 19.2%, which is considered a medium effect because the F-square value ranged between 0.15 - 0.35.

Conclusions

AI is one of the branches of digital transformation and its purpose is to make machines think and help make decisions. The application of AI has become an imperative in the field of accounting for the significant changes that it will lead in this field. There is a positive impact of AI techniques on the FRQ, thus enhancing the performance of the institution. The FRQ according to AI techniques is a mechanism for good governance and mitigate the problem of information asymmetry. AI has techniques that work to find solutions to complex problems that are difficult to solve by traditional methods or cause an obstacle for the establishment to achieve its goals and ensure its continuity. AI works to increase the effectiveness and appropriateness of decision-making due to the role of these technologies in finding solutions to problems and choosing the best alternative .Providing educational courses and training programs on how to deal with all areas of digital transformation, especially AI techniques in the field of accounting. Expanding scientific research related to AI and demonstrating the advantages of AI in the field of accounting and financial reporting. Companies and banks should strive to take advantage of AI techniques, due to the many advantages it brings, most notably improving the FRQ as well as reducing costs. The study recommends the need to increase the FRQ because of its impact on the stability of companies, which in turn is reflected in the economic situation of countries. Attracting experts and specialists in the field of AI in order to contribute to its application in companies and banks. Taking care of the needs of users of accounting information and providing high quality information with high technologies to make appropriate decisions. There is an urgent need for high-quality information for the purpose of getting out of the state of uncertainty and approaching the state of complete certainty, because the decision-making process goes through several stages and involves complications.

Avenue for Future Research

After completing our current study, we propose a set of future studies to complement our study according to the following:

1. Studying the role of AI techniques in controlling financial risks.
2. Studying the impact of integration between AI and cyber security technologies on the financial statements
3. Studying the remaining mechanisms of AI technology and their impact on the FRQ
4. Studying AI technology and its impact on audit quality

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