

The impact of the use of artificial intelligence on the quality of the professional judgment of the auditor in Algeria

أثر استخدام الذكاء الاصطناعي على جودة الحكم المهني لمدقق الحسابات في الجزائر

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Abstract:

The objective of this research is to investigate the perspectives of external auditors in Algeria on how artificial intelligence influences the refinement of their professional judgment in auditing activities. To meet the goals of this research, we utilized existing literature to outline the theoretical framework and augmented this with empirical evidence gathered through a field study involving statistical analysis. This analysis followed the distribution of surveys to a cohort of 50 external auditors based in Algeria. The findings indicated a consensus among the participants concerning the effect of artificial intelligence on various aspects of judgment quality. These aspects include the auditor's individual standards, their educational and practical competencies, and their comprehension of the auditing context, which collectively influence auditor's professional judgment.

Keywords: Artificial Intelligence; Auditor's Professional judgment.

JEL Classification Codes: M42, O33.

ملخص:

الغاية من هذه الدراسة هو استكشاف آراء المدققين الخارجيين الجزائريين حول أثر استخدام الذكاء الاصطناعي على جودة الحكم المهني للمدقق الخارجي ولتحقيق أهداف هذا البحث، استندنا إلى الدراسات السابقة لبناء الإطار النظري للدراسة، وتعزيزه ببحث ميداني. تم توزيع استبيان على عينة مكونة من 50 فرداً من المدققين الخارجيين في الجزائر.

وتوصلنا إلى توافق أفراد العينة الذين شملتهم الدراسة حول أثر استخدام الذكاء الاصطناعي على ابعاد جودة الحكم المهني والمتمثلة في المعايير الشخصية للمدقق، التأهيل العلمي والعملية، فهم المدقق لبيئة التدقيق ومنه التأثير على الحكم المهني للمدقق في حد ذاته. كلمات مفتاحية: ذكاء اصطناعي، حكم مهني للمدقق.

تصنيفات JEL: O33، M42

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INTRODUCTION:

The advent of the Fourth Industrial Revolution in the early 21st century was marked by significant progress in digital technologies, which included developments in mobile networks, three-dimensional printing, artificial intelligence, digital infrastructures, intelligent systems, autonomous vehicles, nanotechnology, biotechnology, materials science, energy storage technologies, quantum computing, automated border control systems, and sophisticated computing prowess.

These technologies boast the capability to craft narratives and challenge the creative prowess of traditional novelists.

Artificial intelligence is one of the types of modern science that has spread widely recently, and has entered many industrial and research fields, most notably robots and smart services for governments and companies. Artificial intelligence, a discipline of computer science, encapsulates the behaviors and attributes that various software applications rely on, mirroring human cognitive functions across diverse tasks. A critical aspect of this capability is the machine's proficiency in learning and executing accurate decisions.

Artificial intelligence acquires information through practical practices, and is able to distinguish between multiple issues accurately. Among the professions in which this modern technology has been relied upon is the external audit profession, where the audit professional views artificial intelligence as a supportive and strategic function for completing audit work and procedures due to the diversity and multiplicity of forms and sizes of different institutions through adopting technology to adapt audit solutions and Achieving the quality of its operations, which leads to strengthening its professional judgment. Despite the increased use of AI systems in recent years, there is limited research examining how auditors' use of AI in difficult tasks impacts their judgment and decision making.

This study aims to assess the influence of artificial intelligence on the efficacy of professional judgment within the auditing industry in Algeria. Current research exploring the effects of artificial intelligence on the quality of auditors' decisions indicates that the Fourth Industrial Revolution is set to bring about significant transformations in various fields, including audit procedures. It is anticipated that technological integration will not only enhance but could potentially automate auditors' decision-making processes progressively.

The research delves into how emerging technologies affect auditing, emphasizing aspects of automation and enhancement. It argues that deliberation, sense-making, and reflexivity, crucial for early career auditors, may be lost when automation is applied to low-value tasks. The paper also questions the meaning of judgment in auditing. It also highlights the challenges auditors face in navigating new areas of indeterminacy, highlighting the need for further research and development. (Rita Samiolo,2023)

(Danielle Lombardi and others,2023) this study investigates the effectiveness of an interactive AI system in improving auditor judgment during fraud risk assessments. It aims to eliminate the dilution effect, which biases novice auditors' judgments, and suggests that this system could enhance audit efficiency and effectiveness when auditors make appropriate risk evaluations.

Another investigation (Heloise Henry, 2021) reveals that artificial intelligence is extensively employed in auditing firms for routine and monotonous tasks, with comprehensive population testing proving most advantageous. This allows auditors to devote more time to activities that

necessitate considerable professional discernment and provide enhanced value. Nonetheless, the successful deployment of AI necessitates advanced technological proficiency and skills, while the significance of human interaction and judgment is increasingly emphasized.

The scholars (Gopalan Puthukulam and others, 2021) undertook this study to clarify the implications of AI and machine learning (ML) augmented auditing techniques on auditors' professional skepticism and decision-making. The findings reveal a positive relationship between the use of AI and machine learning and the enhancement of professional skepticism and judgment. These technologies assist in identifying discrepancies and inaccuracies more effectively. AI and ML contribute to data verification, thereby enhancing reliability in error and fraud detection, in contrast to traditional manual auditing that depends on selective data examination.

This study distinguishes itself from prior works in various ways. It focuses on the insights of external auditors regarding the enhancements artificial intelligence brings to professional judgment quality in Algeria. In contrast, (Rita Samiolo, 2023) investigated auditor judgment amidst the Fourth Industrial Revolution. (Danielle Lombardi et al., 2023) analyzed the deployment of an Interactive Artificial Intelligence System to enhance auditor decision-making in complex situations. (Heloise Henry, 2021) conducted a Thematic Analysis on the influence of Artificial Intelligence (AI) on auditors.

This paper seeks to expand on existing research by offering fresh insights. It mainly focuses on the perspectives of external auditors concerning the role of AI in improving the quality of their professional decision-making. However, the specific effects of AI on the quality of professional judgment among auditors in Algeria have been largely overlooked in previous auditing literature.

Given the strong recommendations for examining auditor and employee perceptions to boost audit quality, researching how auditors view AI is crucial as it significantly influences their professional judgment. Additionally, there are scant studies on the application of AI in auditing globally, particularly concerning auditor's professional judgment, including in Algeria, where research has not yet achieved its full potential. Thus, this paper addresses a significant research gap. The subsequent sections of this document outline the conceptual framework, methodology, data analysis, results, and discussions, which lead to hypothesis testing and analysis, ultimately concluding the paper.

1- Conceptual framework:

1-1-AI and Auditing Profession:

Identifying methods to bolster trust in audited reports and the audit profession at large already presents considerable challenges and demands. Because of the prevalence of contemporary digital technology, auditors are typically required to enhance their degree of productivity and social resilience. It is therefore necessary to stay up to date with advancements and make modifications in the auditing field as it moves toward a more digital framework. (Earl Jed & others, 2023, p. 416)

Artificial intelligence, including methods like sentiment analysis, picture recognition, speech recognition, machine learning, and data mining, offers advanced services to the auditing industry, enabling the interpretation of ledgers, detecting mistakes, and communicating risks to customers. AI-based tools reduce client inquiries and allow for quick examination of whole ledgers, identifying transactions missed by conventional testing methods. (Tamanna Abdul

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Rahman Dalwai, 2022, p. 105)

According to an alternative interpretation, artificial intelligence comprises machines that carry out tasks requiring intelligence, which typically encompasses knowledge acquisition, sensing, thinking, goal-setting and achievement, and generating artificial intelligence through methods like machine learning (ML), deep learning, and language understanding. (boubiaia & wafi, 2021, p. 356)

These days, artificial intelligence is an issue that is changing social and professional spheres. Artificial intelligence, a scientific area that has its roots in ancient Greece, strives to build computers that can replicate human intellect in a variety of jobs. The discipline leverages unique human characteristics such as the capacity for language creation and symbol manipulation through artificial networks, culturally ingrained systems, and algorithms, rather than attempting to mimic and replicate human cognitive functions. Artificial intelligence aims to integrate elements of human intelligence into computing systems to achieve its goals. (Luis Rodrigues, 2023, p. 2)

The audit field, still in its developmental stages and where artificial intelligence is regarded as a supportive tool for ongoing corporate success, is significantly impacted by AI. The integration of AI is expected to expedite the completion of complex tasks and enhance performance levels. As a result, auditors are advised to rely on AI to pinpoint elements that enhance the efficacy and efficiency of the external audit process, thus facilitating faster and more economical auditing activities. Such improvements not only enhance the quality of audit work but also increase the productivity of external auditors. (Raed, 2021, p. 1)

A study by Khaled Hussainey and Nora Azima Noordin notes that as the business environment becomes more complex, technology-driven decision-making tools are increasingly vital. Thus, the auditing profession must adopt artificial intelligence technologies to navigate these complexities effectively. AI is seen as a crucial factor in enhancing the synergy between AI tools and auditing processes, especially due to the necessity for their adoption and the auditor's increased professional skepticism. (Nora Azima Noordin, 2022, p. 2)

According to a report by the American Institute of Certified Public Accountants (AICPA), utilizing AI can reduce the risk of human fatigue during the repetitive analysis of organizational data. It is also recognized that these tools can process large volumes of data, both accurate and erroneous from various sources, and identify patterns, connections, and anomalies that might not be evident to auditors. As a result, auditors are required to apply their professional expertise and judgment to assess the validity and relevance of these findings, thereby influencing their decision-making processes. (AICPA & C., 2020, p. 4)

1-2-AI and Professional judgment:

Narratives regarding technological change suggest that the deployment of new technologies, such big data analytics, can be more challenging and time-consuming because of conflicts within audit companies and a lack of regulatory direction. As we delve into increasingly sophisticated technologies such as AI and machine learning that mimic auditor judgment, this development often emerges. Prior research on the effects of the Fourth Industrial Revolution has predominantly centered on the routine or duplicable elements of auditing tasks. As auditing incorporates these advanced technologies, the perennial debates concerning the structure of audit governance often emerge anew. (Rita samiolo, 2023, p. 4)

Machine learning along with other advanced cognitive methods are employed in predictive analytics and decision support systems to discern patterns in data that can predict future outcomes, aiding individuals in making informed decisions based on these forecasts. Such applications include data retrieval and searches, future data predictions, failure forecasting, behavior anticipation, selection and matching of optimal solutions, detecting similarities and matches in data, enhancing operations, and intelligent navigation systems. (Raed, 2021, p. 4)

Additionally, the study makes the assumption that after engaging with an AI system, less seasoned auditors in a mixed information environment may downgrade their original evaluations of fraud risk. The study's findings also show that utilizing an AI system with structured and interactive information processing capabilities can help with decision-making and enhance auditor judgment. when carrying out challenging and intricate jobs. In particular, it can lessen users' cognitive load and effort while improving their judgment process, which is different from some other general conclusions that the AI system is a trustworthy and useful tool for auditors to utilize when making decisions about fraud risk. Raising the standard of auditing. (Danielle & and others, 2023, p. 31)

The notion of creating an electronic software that does all of the steps and tasks that an auditor would perform, from planning to selecting sample sizes to writing work documents to receiving the audit report, was put out in Raed Saad's research. Research examining the efficacy of internal control mechanisms asserts that incorporating artificial intelligence throughout the auditing process is crucial for achieving audit objectives and improving audit quality. AI tools are indispensable to business entities as they enable improved decision-making, scrutinize anomalies, and elevate quality, factors essential for a business's sustainability and competitive edge. (Raed, 2021, p. 6)

1-3-Determinants of quality of auditor's professional judgment:

1-3-1-professional judgment:

Professional judgment encompasses not just an array of experiences integrated into the auditor's cognitive framework but also pertains to the mental strategies utilized by the auditor to process incoming data. This process includes juxtaposing newly gathered insights from specific scenarios against the auditor's extensive mental archive of past experiences. (Hassan, 2012, pp. 569-570)

In the domains of auditing, accounting, and ethical norms, professional judgment is characterized as "the utilization and reliance on pertinent education, expertise, and experience in making informed and accurate determinations concerning actions appropriate to the circumstances of the audit task." (Hoang To Loan , 2023, p. 02)

1-3-2-Additional elements influencing the quality of the auditor's professional judgment:

Previous studies have shown that a number of factors, including the auditors' personal traits, their present work environment, and their cumulative knowledge and experience, might affect their professional judgment when conducting audits. Personal traits rank among the most significant components in these categories. In terms of the practical ramifications, new research has shed light on the individual characteristics covered by auditing standards that affect practicing auditors' professional judgment. For instance, experience and job level play a significant role in assessing the professional judgment of auditors. They demonstrated how individual characteristics like education, experience, psychological condition, and industry

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knowledge affect the use of professional judgment. (Hoang To Loan , 2023, p. 3)

Professional standards, which provide auditors guidelines, have an impact on professional judgment, a delicate subject. Elevated levels of professional judgment are required from auditors during the audit process due to these factors. The Canadian Institute of Certified Public Accountants (1995) identified two key factors, information collection and synthesis of findings, as among the five main criteria influencing an auditor's professional judgment. Below is an overview of these determinants:

- Audit engagement context (such as accountability, business acumen, audit panels, market competition, and established professional guidelines) includes additional factors that influence the deployment of professional judgment in independent audits.
- Characteristics of an auditor (including autonomy, fairness, integrity, knowledge accumulation, experiential learning, specialized proficiency, professional capability, judgment biases, and professional skepticism),
- This document aims to promote uniformity within the profession by highlighting the significance of audit evidence concerning materiality and audit risk, thereby ensuring that the evidence collected is both sufficient and pertinent.

- The auditing methodology encompasses identifying key issues, gathering relevant information, exploring possible solutions, evaluating alternatives, and making informed decisions. The research delves into the qualitative dimensions of audit judgments such as accuracy, agreement, durability, uniformity, indication of problems, self-perception, justifiability, consultation practices, and record-keeping. (Elçin & Dursun , 2018, pp. 144-145)

The effectiveness of external audits is determined by the external auditor's ability to gather information, conduct analyses, and assess risks, all anchored by their professional judgment.

Attributes of the external auditor, such as independence, specialized knowledge, focus area, and professionalism, are critical. The audit's quality hinges on the auditor's ability to detect and report errors and significant discrepancies in financial statements. This capability helps bridge the informational gap between shareholders and management, thereby protecting shareholder interests amid the separation of ownership and management. (mahmoud Hassan , 2023, pp. 237-238)

2-Methodology

A statistical study was conducted in order to collect data and information related to the phenomenon or research problem under study. To meet the research goals, a qualitative instrument in the form of a questionnaire was employed, targeting expert accountants and auditors within Algeria. This methodology is also considered appropriate and logical to allow easy comparison of data and the ability to implement quantitative analyses. It provides simplicity in processing data statistically. Descartes' five-point scale was employed to collect responses from the sample members, consisting of 50 external auditors.

3-RESULTS AND DISCUSSION

3-1-Validity and reliability of study tool

3-1-1- Validity: Validity was established using two approaches:

- **Apparent validity:** An expert panel evaluated the questionnaire to examine the clarity of the item wording and their pertinence to the study's variables. Their input prompted adjustments that enhanced the survey instrument.

-Construct validity: The findings are displayed in the subsequent table:

Table01 : Pearson correlation coefficient results

Variable	Pearson correlation coefficient	The dimensions	Significance level
Artificial intelligence	0.437	Artificial Intelligence	*0.001
Quality of auditor's professional judgment	0.559	Auditor's personal standards	*0.000
	0.365	Scientific and practical qualifications	*0.009
	0.425	The auditor's understanding of the audit environment	*0.002
	0.844	Auditor professional skepticism	*0.000

Source: Prepared by researchers based on SPSS V26 outputs

* Statistically significant at $\alpha \leq 0.05$

**Statistically insignificant at $\alpha \geq 0.05$

The Pearson correlation coefficients, which assess the relationship between the artificial intelligence dimension and the total questionnaire scores, are statistically significant at a threshold of $\alpha \leq 0.05$. This implies that the observed significance is below the established limit. Additionally, the correlation coefficients between the dimensions of the quality of the auditor's professional judgment and the overall dimension are also statistically significant at $\alpha \leq 0.05$. With coefficients ranging from 0.365 to 0.844, all positive, the research instrument demonstrates strong construct validity, confirming its ability to accurately measure the intended variables.

3-1-2- Instrument Reliability: The ensuing table presents the results. The reliability of the questionnaire was ascertained through the Cronbach's Alpha coefficient method, as elaborated in the subsequent table:

Table: The results of the stability coefficient

Variables	Cronbach's Alpha	The stability
Artificial Intelligence	0.780	0.883
Quality of auditor's professional judgment	0.935	0.966
the entire survey	0.912	0.954

Source: Prepared by researchers based on SPSS V26 outputs

***Persistence is square root of Cronbach's alpha coefficient.**

Stability is derived by taking the square root of the Cronbach's alpha coefficient. As shown in the table above, the overall survey's Cronbach's alpha recorded a value of 0.912, while the initial and subsequent axes showed values of 0.780 and 0.935, respectively. Additionally, the stability coefficients for each axis of the survey were notably high, with values ranging from 0.883 to 0.966. For the entire survey, stability was estimated at 0.954. Since all stability coefficients surpassed 0.700, it confirms that the survey tool exhibits a high degree of reliability.

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3-2-Analysis of the study results:

3-2-1-Analysis of sample characteristics: Based on the information gathered from the personal characteristics of the sample participants via the questionnaire, the collected data is represented in the following table:

variable	years	frequency	Pourcent age	variable	Certificate	frequency	pourcent age
Age group	From 20 to 29 years	4	8	Educational level	Bachelor's degrees	38	76
	From 30 to 39 years	7	14		Master's degrees	4	8
	From 40 to 49 years	34	68		doctorates	8	16
	50 years and more	5	10	Practical level	Accounting Expert	22	44
Years of work	Less than 5 years	5	10		auditor	8	56
	From 5 to 10 years	28	56				
	From 11 to 15 years	10	20				
	16 years and more	7	14				

Source: Prepared by researchers based on SPSS V26 outputs

It is evident that a significant proportion of the sample (68%) falls within the average age range, underscoring a youthful dominance within the accounting and auditing sector. This trend is likely driven by the ample job opportunities available in this field for accountants and auditors. The educational qualifications of the sample are also noteworthy, with 76% holding either a bachelor's or master's degree. Of the surveyed individuals, 24% hold both master's and doctoral degrees, confirming that each participant has the high-level academic credentials required for the rigors of the profession. Additionally, it was noted that 56% of the participants are auditors, with the remaining 44% being experts in accounting. This discrepancy can be attributed to certain prerequisites required for obtaining an accounting expert certificate, such as specific experience and other criteria.

Regarding the distribution of professional experience, 56% of the respondents have accrued between 5 and 10 years of experience. This positively reflects the competencies of the sample and meets the requirements of their roles, which generally necessitate substantial practical expertise. The participants selected for the study are among the most informed on the topic, thereby enhancing the study's validity.

3-2-2-Statistical Analysis of First Axis of Instrument: To analyze the items in the first axis representing artificial intelligence's sufficiency to achieve effectiveness of use, the following table was utilized, summarizing the statistical results:

Table 8: Arithmetic Means and Standard Deviations of Sample Individuals' Responses Regarding Artificial Intelligence's Sufficiency to Achieve Effectiveness of Use

Variable	paragraphs	The arithmetic mean	Standard deviation	Degree of adoption
Artificial Intelligence's Sufficiency to Achieve Effectiveness of Use	10 – 01	4.15	0.323	high

Source: Prepared by researchers based on SPSS V26 outputs

The table presented above indicates that the mean scores for the respondents' views on the suitability of artificial intelligence for effective implementation were significantly elevated. The overall mean was 4.15 with a standard deviation of 0.323. This can be attributed to the consensus among respondents regarding artificial intelligence being sufficient to achieve effectiveness of use. It is perceived as a modern technology capable of assisting users in performing their tasks in easy and quick ways, thus eliminating laborious manual work.

3-2-3-statistical Analysis of Second Axis of instrument: The table shown previously demonstrates that the average scores reflecting the participants' opinions on the appropriateness of artificial intelligence for efficient execution were notably high.

Table: Mean values and standard deviations of the responses related to the quality of the auditor's professional judgment.

Dimensions of the quality of the auditor's professional judgment	Paragraphs	Std-deviation	Mean	Rank	Degree of adoption
Auditor's personal standards	11-16	4.25	0.487	1	Very high
auditor's understanding of the audit environment	24-28	4.20	0.416	2	Very high
auditor's scientific and practical qualification	17-23	4.16	0.416	3	high
professional scepticism of Auditor's	29-34	3.92	0.556	4	high
the quality of professional judgment	-	4.13	0.487	-	high

Source: Compiled by researchers using SPSS V26 software.

The information shown in the table above indicates a positive perception among the study participants regarding the quality of professional judgment in auditing, as evidenced by an average score of 4.13 and a standard deviation of 0.487. Among the evaluated attributes, personal criteria for auditors emerged as the most significant, achieving the highest average score of 4.25 and a standard deviation of 0.487. This score reflects the participants strong belief in the necessity of possessing specific personal attributes and standards, such as independence, for auditors. The strong approval ratings reflect the participants staunch support for maintaining these standards across various aspects of auditing, from planning and conducting audits to reporting findings and expressing professional judgments.

In evaluating their understanding of the audit environment, this factor was rated second highest with an average score of 4.20 and a standard deviation of 0.416. Academic and practical qualifications were ranked third with an average score of 4.16 and a standard deviation of 0.489, indicating a slightly lesser but still notable importance attributed to these qualifications by the respondents.

Professional skepticism held the fourth position, with an average score of 3.92 and a standard deviation of 0.556, and also received a high endorsement rate. This suggests that the quality of

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professional judgment in auditors is greatly reliant on their personal attributes, which are crucial during the performance of their sensitive duties. Thus, a robust understanding of these elements, followed by academic and practical qualifications and professional skepticism, are deemed essential determinants of an auditor's work quality.

3-2-4-Hypothesis testing and analysis: To address the research question, the study's hypotheses were examined through simple linear regression, and the findings are displayed.

Table: Simple linear regression test results for both the main hypothesis and the sub-hypotheses

Hypotheses	Independent variable	Dependent variable	R	R square	F	Sig
The main hypothesis	Artificial intelligence	the quality of professional judgment	0.70	0.490	6.765	0.001
			$Y=2.265 + 3.156x + \varepsilon_i$			
sub-hypothesis 01	Artificial intelligence	Personal Standards	0.51	0.260	28.077	0.000
			$Y1=1.365 + 1.289x + \varepsilon_i$			
sub-hypothesis 02	Artificial intelligence	auditor's scientific and practical qualification	0.80	0.64	12.158	0.002
			$Y2=1.078 + 0.345x + \varepsilon_i$			
sub-hypothesis 03	Artificial intelligence	auditor's understanding of the audit environment	0.63	0.39	7.025	0.013
			$Y3=2.846 + 0.065x + \varepsilon_i$			
sub-hypothesis 04	Artificial intelligence	professional scepticism of Auditor's	0.33	0.10	2.589	0.118
			$Y4=2.984 + 0.246x + \varepsilon_i$			

Source: Compiled by researchers using SPSS V26 software.

* Statistically significant at $\alpha \leq 0.05$

The following summarizes the outcomes from testing the primary hypothesis and its sub-hypotheses:

3-2-4-1-Testing the main hypothesis

The main hypothesis: "There is a statistically significant effect of the use of artificial intelligence on the quality of professional judgment according to the opinions of auditors in Algeria at a significant level ($\alpha \geq 0.05$).” Statistical evaluations provided the following insights:

- The correlation coefficient, recorded at (0.70), indicates a strong and positive direct relationship between the integration of artificial intelligence and the enhancement of the auditor's professional judgment.
- The coefficient of determination shows that (49%) of the variations in the auditor's judgment quality can be ascribed to AI, whereas the other (51%) are influenced by various factors not accounted for in this study.
- Results from the (F-Test) underscore the robustness of the model where AI acts as an independent variable that significantly affects the quality of the auditor's judgment as a dependent variable. The (F) value reached (6.765), with a significance level (Sig=0.001) substantially below the standard threshold of 0.05, thus validating the hypothesis that: "The integration of AI significantly enhances the quality of professional judgment."

Drawing from the research by Rita Samiolo and Danielle Lombardi, it is evident that AI positively influences judgment quality through its array of auditing techniques. These techniques enable auditors to thoroughly scrutinize and analyze various situations encountered during audit tasks, thereby facilitating sound and high-quality professional judgments. Dependence on AI outputs may shape how auditors evaluate the importance of findings and decide on suitable audit procedures.

3-2-4-2- Testing the sub-hypotheses:

- **First sub-hypothesis:** “There is a statistically significant effect of the use of artificial intelligence on the auditor's personal standards according to the opinions of auditors in Algeria at a significant level ($\alpha \geq 0.05$)”. The findings from the statistical evaluation are as follows:
 - The correlation coefficient, recorded at (0.51), reveals a substantial positive association between artificial intelligence and the auditor's personal ethical standards.
 - The coefficient of determination reveals that (26%) of the alterations in the auditor's personal standards can be attributed to AI, while the remaining (74%) are influenced by external factors not examined in this analysis.
 - The (F-Test) value, standing at (28.077) with a significance level (Sig=0.000) markedly below the threshold of 0.05, supports the hypothesis stating: "Artificial intelligence significantly impacts the auditor's personal standards, as viewed by auditors in Algeria with a significant level ($\alpha \leq 0.05$).” This underscores the pivotal role of personal standards in enhancing the quality of an auditor’s professional judgment as evidenced by the study conducted by Hoang To Loan Nguyen, which highlighted the influence of personal factors on professional judgment.
 - The adoption of AI in auditing introduces complex ethical considerations related to data privacy and algorithmic fairness, requiring auditors to adeptly manage these issues while upholding their ethical standards. As AI influences a key aspect of auditor judgment quality, it concurrently affects the overall integrity of the auditor’s professional judgment.
- **The second sub-hypothesis:** “There is a statistically significant impact of the use of artificial intelligence on the auditor's scientific and practical qualification according to the opinions of auditors in Algeria at a significant level ($\alpha \geq 0.05$).” The statistical findings showed:
 - The correlation coefficient value is (0.80), demonstrating a robust positive direct connection between artificial intelligence and the auditor's scientific and practical capabilities.
 - The coefficient of determination reveals that (64%) of the variations in the auditor's scientific and practical qualifications are attributable to AI, while the remaining (36%) are due to other variables not considered in this study.The (F-Test) value underscores the robustness of the relationship model between AI as an independent variable and the standards of scientific and practical qualifications as a dependent variable. The (F) value was (7.025), with a significance level (Sig=0.002), well below the 0.05 threshold. This supports the hypothesis: “The use of artificial intelligence significantly impacts the dimension of the auditor's scientific and practical qualifications according to the perspectives of auditors in Algeria, with statistical significance ($\alpha \geq 0.05$).” According to Hoang To Loan Nguyen's study, the position level and experience are crucial in determining auditors'

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level of professional judgment. The study by the American Institute of Certified Public Accountants (AICPA) and auditors' responses highlight the necessity for auditors to familiarize themselves with AI techniques used in auditing. Consequently, auditors must develop the skills to leverage these technologies effectively and stay abreast of rapid advancements in the field. AI can influence the auditor's acquisition of knowledge and development of their skills in their field in an easy way through the use of new applications, and they can obtain the experience of previous auditors through machine learning techniques. The adoption of AI by the auditor requires new technical skills in data analysis and machine learning, as professional qualifications need to incorporate training on these modern technologies to ensure that auditors are able to effectively utilize them in their work. It can be said that AI emphasizes its impact on this dimension on the need for continuous learning and ethical awareness.

- **The third sub-hypothesis:** “There is a statistically significant impact of the use of artificial intelligence on the auditor's understanding of the audit environment. According to the opinions of auditors in Algeria at a significant level ($\alpha \geq 0.05$).” The statistical results indicated:
 - _ The correlation coefficient is (0.69), suggesting a strong direct relationship between the use of artificial intelligence and the auditor's comprehension of the audit environment.
 - _ The coefficient of determination shows that (39%) of the variation in the auditor's understanding of the audit environment is due to AI, while the remaining (61%) is influenced by other factors not covered in this analysis.
 - _ The (F-Test) result of (28.077) with a significance level (Sig=0.013), which is below the standard threshold of 0.05, confirms the hypothesis: "Artificial intelligence significantly impacts the auditor's understanding of the audit environment." This finding is further supported by the conclusion that: "The integration of artificial intelligence profoundly affects the auditor's understanding of the audit environment, as evaluated by auditors in Algeria, at a significant level ($\alpha \leq 0.05$).” AI technologies provide auditors with access to analyses of historical data, industry trends, and regulatory updates, all of which are crucial for identifying risks.
 - _ According to (Elçin Şişmanoğlu and Dursun), the audit engagement context (which includes elements like accountability, business acumen, client engagement continuity, audit panels, market competition, and professional norms) significantly influences auditors' application of professional judgment.

Given that this aspect significantly enhances the overall quality of the auditor's professional judgment and is affected by AI, it is clear that AI has a notable influence on the entire range of professional judgment quality.

- **The fourth sub-hypothesis:** “There is no statistically significant effect of the use of artificial intelligence on professional doubt according to the opinions of auditors in Algeria at a significant level ($\alpha \geq 0.05$).” The statistical outcomes are as follows:
 - _ The correlation coefficient, recorded at (0.33), indicates a minimal connection between artificial intelligence and professional skepticism.
 - The coefficient of determination reveals that only (10%) of the changes in the auditor's professional skepticism can be attributed to AI, while the remaining (90%) are due to other

factors not considered in this evaluation

- The (F-Test) result, positioned at (28.077), with a significance value (Sig=0.118) that exceeds the established threshold of 0.05, leads to the dismissal of the hypothesis that: "Artificial intelligence lacks a statistically significant impact on professional skepticism as perceived by auditors in Algeria at a significant level ($\alpha \leq 0.05$).\" According to the research of (Alaa Abdelnasser Sakkal), professional skepticism is essential to the auditing process and forms a critical component of an auditor's capabilities. It is fundamentally connected to the professional judgments within the audit process, which are crucial for enhancing audit quality.

Based on this study and feedback from auditors, AI has minimal impact on auditors' professional skepticism because this type of skepticism is a core skill developed through training, experience, and the exercise of professional judgment. Although AI can automate specific aspects of the audit process, the auditor is still tasked with managing the audit, examining underlying assumptions, and applying judgment, functions that AI cannot completely automate.

Conclusion:

Professional judgment is a key element in the auditing process. The primary aim of auditing is to enhance the credibility of financial statements through an impartial technical assessment by the external auditor, thereby increasing trust in the auditor as a central figure in the profession.

The auditor's professional judgment is shaped by a variety of factors, including personal standards, educational background, practical experience, and comprehension of the audit environment. However, with the advent of artificial intelligence, often referred to as the Fourth Industrial Revolution, our field study has demonstrated, based on auditor feedback, that AI techniques significantly enhance the quality of professional judgment across its three examined dimensions. Key findings include:

- AI's implementation by Algerian auditors influences their personal standards such as independence, objectivity, integrity, and transparency.
- AI helps auditors in understanding the audit environment, facilitating an easier grasp of the area to be audited.
- AI impacts the auditors' academic and practical qualifications, enabling easier acquisition of knowledge and experience, and fostering skill development in modern technology.
- The study participants concurred that AI does not impact the auditor's professional skepticism, viewing it as an intrinsic human skill essential for conducting audit activities.
- AI significantly enhances the quality of the auditor's professional judgment by influencing its determining factors.

Based on these outcomes, we recommend the following:

- Encouragement for Algerian external auditors to integrate AI techniques.
- Encouraging accountants and bookkeepers to enhance their professional judgment by integrating artificial intelligence into their practices.
- Initiatives to enhance external auditors' skills through the implementation of artificial intelligence applications.

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- _ Implementation of training programs for external auditors in modern technological fields.

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