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Artificial Intelligence in Accountancy: Skills Evolution, Ethical Challenges and Future Directions in Digital Economy

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A B S T R A C T
Artificial Intelligence is transforming the accounting landscape at a rapid pace, gradually automating tasks that no longer require human intervention, thereby contributing to more accurate decision-making and prompting a shift in the skills necessary for practicing accountants. Using survey data collected from 289 accountants and auditors across the industry and public accounting sectors, this study explores the impact of AI adoption on accounting practices and skills. Descriptive statistics show that 72% of respondents use AI-enabled tools: artificial intelligence platforms, robotic process automation (RPA), and data analytics platforms, with the adoption ratio significantly higher among large businesses compared to SMEs. Correlation and regression analyses verify a strong positive association between AI adoption and skill transition ($r = .61$, $p < .01$; $\beta = .47$, $p < .001$), suggesting that more use of AI is directly related to higher requirements of technical skills (programming, data visualization) and soft skills (critical thinking, communication, ethical judgement). However, the results also reveal significant training deficiencies, especially regarding the ethical use of AI, which was covered by only 46% of respondents in formal governance or transparency frameworks. These findings underscore the importance of reskilling programs, ethical safeguards, and policy support, as well as the need to ensure that AI adoption contributes not only to efficiency but also to sustainable and responsible career development. The contribution of this research is that it offers a developing economy perspective on global discussions about the future of accounting, which can be of value to organizations, regulators, and professional bodies grappling with the digital transformation of the financial services industry.

الكلمات الدالة:
مهنة المحاسبة؛ تحول المهارات؛ التكنولوجيا المالية؛ الذكاء الاصطناعي الأخلاقي؛ الاقتصاد الرقمي؛ التنمية المستدامة.

الملخص
يُحدث الذكاء الاصطناعي تحولاً في مشهد المحاسبة بوتيرة سريعة، حيث يُؤتمت تدريجياً المهام التي لم تعد تتطلب تدخلاً بشرياً، مما يُسهم في اتخاذ قرارات أكثر دقة ويُحفز على إحداث تحول في المهارات اللازمة للمحاسبين الممارسين. باستخدام بيانات المسح التي تم جمعها من 289 محاسباً ومدققاً في قطاعي الصناعة والمحاسبة العامة، تستكشف هذه الدراسة تأثير اعتماد الذكاء الاصطناعي على ممارسات ومهارات المحاسبة. تُظهر الإحصاءات

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الوصفية أن 72% من المشاركين يستخدمون أدوات مُمكّنة بالذكاء الاصطناعي: منصات الذكاء الاصطناعي، وأتمتة العمليات الروبوتية (RPA)، ومنصات تحليل البيانات، مع ارتفاع نسبة التبني بشكل ملحوظ بين الشركات الكبيرة مُقارنةً بالشركات الصغيرة والمتوسطة. ب- تُثبت تحليلات الارتباط والانحدار وجود ارتباط إيجابي قوي بين اعتماد الذكاء الاصطناعي وانتقال المهارات (r = .61، p <.01؛ β = .47، p <.001)، مما يُشير إلى أن زيادة استخدام الذكاء الاصطناعي ترتبط ارتباطًا مباشرًا بمتطلبات أعلى من المهارات التقنية (البرمجة، وتصور البيانات) والمهارات الشخصية (التفكير النقدي، والتواصل، والحكم الأخلاقي). ومع ذلك، تكشف النتائج أيضًا عن قصور كبير في التدريب، لا سيما فيما يتعلق بالاستخدام الأخلاقي للذكاء الاصطناعي، والذي لم يُغطَّه سوى 46% من المشاركين في أطر الحوكمة أو الشفافية الرسمية. تُؤكد هذه النتائج على أهمية برامج إعادة تأهيل المهارات، والضمانات الأخلاقية، ودعم السياسات، بالإضافة إلى ضرورة ضمان مساهمة تبني الذكاء الاصطناعي ليس فقط في الكفاءة، بل أيضًا في التطوير المهني المستدام والمسؤول. وتكمن مساهمة هذا البحث في أنه يُقدم منظورًا للاقتصادات النامية حول المناقشات العالمية حول مستقبل المحاسبة، وهو ما يُمكن أن يكون ذا قيمة للمؤسسات والهيئات التنظيمية والهيئات المهنية التي تُكافح التحول الرقمي في قطاع الخدمات المالية.

JEL Classification: *M41, M15, G32, O33, & C83.*

1. Introduction

Artificial Intelligence (AI) has rapidly evolved from a supportive business tool into a central driver of organizational transformation across multiple industries, including healthcare, education, finance, and accounting. In finance, the emergence of FinTech solutions—such as blockchain, mobile payments, and digital auditing platforms—has revolutionized traditional operations by delivering greater speed, accuracy, and security (Iqbal & Hayat, 2025; Kokina & Davenport, 2017). Within accounting specifically, AI technologies including robotic process automation (RPA), machine learning (ML), and natural language processing (NLP) are streamlining repetitive tasks like data entry, reconciliations, and tax processing. At the same time, these technologies extend far beyond automation, enabling sophisticated applications such as predictive modeling, fraud detection, and advanced analytics (Richins et al., 2017; ICAEW, 2019). This shift underscores the profound role of AI in redefining how financial information is managed and interpreted.

The implications of this transformation extend beyond efficiency gains to the very competencies required of accounting professionals. Accountants are increasingly expected to master data analytics, digital platforms, and programming languages such as Python and R, while also strengthening human-centered skills such as ethical reasoning, communication, and critical thinking (ACCA, 2020; Brynjolfsson & McAfee, 2017). This reconfiguration of professional requirements reflects a wider global trend in which technological change is altering workforce dynamics and creating demand for hybrid skills that combine technical literacy with strategic insight (Pan & Seow, 2016). In this sense, the accountant's role is evolving from a passive record-keeper to an active strategic advisor who translates AI-driven insights into informed organizational decisions. However, the increasing reliance on AI raises significant concerns related to ethics, governance, and inclusivity. Challenges such as algorithmic bias, data privacy risks, and a lack of transparency highlight the urgent need for governance frameworks that ensure the responsible and accountable use of AI (Issa et al., 2016; IFAC, 2022). Furthermore, adoption patterns reveal sharp disparities: large corporations are generally better positioned to integrate AI due to greater financial and infrastructural resources, while small- and medium-sized enterprises (SMEs) often struggle to keep pace. Similarly, developing economies face slower adoption relative to advanced economies, reflecting a persistent digital divide that must be addressed through inclusive training, investment, and public policy (World Economic Forum, 2020; Chui & Francisco, 2017). These divides not only affect competitiveness but also risk reinforcing inequalities in the global workforce.

The transformative nature of AI in accounting is also closely tied to the broader evolution of FinTech. Innovations in blockchain, digital payments, and cryptocurrencies are reshaping financial transactions and

reporting systems, creating new opportunities but also introducing complex risks. In this evolving landscape, accountants are increasingly central to safeguarding financial integrity, ensuring compliance, and maintaining transparency in AI-driven systems (Iqbal & Hayat, 2025). As these technologies blur traditional boundaries in financial services, the demand for hybrid skillsets—combining technical knowledge with judgment-based competencies—becomes even more pronounced. This dual responsibility requires accountants not only to process financial data but also to interpret, contextualize, and advise on AI-generated outputs in ways that support organizational resilience (Pan & Seow, 2016).

Despite its potential, AI adoption in accounting introduces unresolved governance and ethical dilemmas. Concerns around bias, privacy breaches, and the opacity of AI decision-making have drawn increasing scrutiny from both researchers and practitioners (Issa et al., 2016; Janssen et al., 2020). Professional bodies and regulators are thus tasked with designing ethical frameworks that preserve accountability and trust in financial reporting while facilitating innovation (IFAC, 2022). Yet, as with adoption rates, access to governance resources and training is uneven, creating gaps between large and small organizations and between global North and South. Addressing these disparities requires a coordinated approach that integrates policy development, professional education, and organizational investment in ethical AI capacity-building (World Economic Forum, 2020). The motivation for this study lies in these unresolved tensions. On a practical level, organizations face mounting pressure to adopt AI to remain competitive, but their capacity to adapt varies widely depending on resources, infrastructure, and training opportunities (Moll & Yigitbasioglu, 2019). On an academic level, existing literature has largely emphasized technological efficiency, with less attention paid to the human capital dimension—namely, how accountants acquire and transform skills in response to AI. Similarly, while ethical concerns such as transparency and bias are widely acknowledged, limited empirical evidence exists on how these issues are experienced and perceived by practitioners in developing economies (Issa et al., 2016; Janssen et al., 2020). By exploring the perspectives of 289 accountants from a developing economy, this study contributes to filling these gaps. It highlights how practitioners navigate the dual role of AI: as a driver of efficiency, innovation, and competitiveness, and as a source of ethical and professional challenges that must be carefully managed. The findings underscore the necessity of balancing technological innovation with governance and inclusivity, ensuring that AI adoption supports sustainable professional development rather than deepening existing inequalities. In doing so, this study adds to global debates on the future of accounting by demonstrating that the discipline's evolution is not defined solely by automation but by the integration of human expertise, ethical responsibility, and technological advancement.

2. Literature Review

Over the past decade, a growing body of research has examined the transformative role of Artificial Intelligence (AI) in reshaping the accounting profession. Early studies primarily focused on the automation of repetitive and routine tasks through Robotic Process Automation (RPA), such as data entry, reconciliations, and invoice processing (Earley, 2015; Kokina & Davenport, 2017). These studies highlighted how automation reduces operational costs and improves efficiency in financial reporting systems. With the emergence of Big Data Analytics and Machine Learning (ML), the scope of AI in accounting has expanded to include more sophisticated tasks such as fraud detection, predictive auditing, and advanced financial forecasting (Richins et al., 2017; Issa et al., 2016). Research also indicates that AI-driven audit practices improve accuracy in decision-making and reduce the risk of human errors, thereby strengthening the reliability of financial information (Moll & Yigitbasioglu, 2019).

From a skills perspective, professional reports such as ACCA (2020) emphasize that future accountants must integrate technical competencies—such as proficiency in programming, data visualization, and statistical analysis—with soft skills including critical thinking, problem-solving, and ethical judgment. This skill shift redefines the accountant's role from a record-keeper to a strategic advisor who interprets data-driven insights for organizational decision-making (Pan & Seow, 2016). Furthermore, recent studies have raised attention to the ethical and governance dimensions of AI in accounting. Key concerns include algorithmic bias, data privacy, and transparency of predictive models (IFAC, 2022; Janssen et al., 2020). These issues underscore the need for responsible AI adoption supported by robust governance frameworks

and ethical standards. Finally, emerging literature explores the intersection of AI with financial technologies (FinTech), including blockchain, digital currencies, and automated auditing platforms. These innovations are expected to fundamentally reshape auditing practices, payment systems, and financial supply chains (Schäfer & Seuring, 2019; Iqbal & Hayat, 2025).

AI is profoundly transforming the field of accounting, impacting skill sets, ethical standards, and future operational directions. As AI continues to evolve, its integration into accounting practices necessitates a reassessment of the skills accountants need, addressing ethical dilemmas, and anticipating future trends in the digital economy. The advent of AI has led to significant skill transformations in the accounting profession. Research indicates that the integration of technologies such as Robotic Process Automation (RPA) illustrates AI's potential to automate routine tasks, thereby altering job descriptions and requiring new competencies from accountants (Tandiono, 2023). Abhulimen and Ejike underscore that as AI facilitates operational efficiencies in Small and Medium-sized Enterprises (SMEs), it creates demand for advanced analytical and technical skills within the workforce (Abhulimen & Ejike, 2024). This shift necessitates continuous professional development to adapt to new AI-driven tools and methodologies, ensuring accountants remain relevant in dynamically evolving environments. Simultaneously, the ethical challenges associated with AI in accounting are gaining attention. The deployment of AI raises significant concerns including data privacy, algorithm bias, and accountability issues (Adelakun et al., 2024; Islam, 2024). As highlighted by Adelakun et al., the ethical landscape in accounting is becoming complex as firms navigate these concerns while leveraging AI for enhanced decision-making and risk management (Adelakun et al., 2024). Furthermore, Akhter et al. emphasize that the growth of AI technologies requires frameworks for addressing fairness and transparency, which are essential for maintaining public trust in accounting practices (Akhter et al., 2024). These ethical considerations demand proactive engagement from accounting professionals, who must develop strategies to ensure the integrity and accountability of AI systems in their operations. Looking ahead, the future of accounting in the context of AI is likely to revolve around innovation and adaptability. Igou et al. suggest that as digital technologies such as AI and blockchain gain traction, the accounting profession will witness a transition from traditional practices towards more sophisticated, technology-driven approaches (Igou et al., 2023). This will not only enhance operational efficiencies but also challenge existing regulatory frameworks (Farayola et al., 2023; Jing-jing et al., 2023). Emerging business models, characterized by AI-driven insights and data analytics, will redefine the role of accountants as strategic advisors rather than mere number-crunchers (Farayola et al., 2023). Moreover, continuous dialogue regarding the ethical implications of these technologies will be crucial for shaping policies and regulations that ensure responsible AI usage in accounting. Thus, the intersection of AI technology with accounting is ushering in a transformative era that challenges existing skill sets, heightens ethical accountability, and propels the profession toward innovative practices. The trajectory of AI in accounting signifies not only a technological revolution but a profound shift in professional identity and ethical responsibility, requiring a collaborative approach to navigate the complexities it introduces.

2.1 Artificial Intelligence in Accounting

The integration of Artificial Intelligence (AI) in accounting represents a transformative evolution in operational methodologies, enhancing efficiency, accuracy, and decision-making capabilities within the industry. Various technologies, including robotic process automation (RPA), big data analytics, and machine learning, are increasingly utilized to streamline accounting processes and improve compliance mechanisms. RPA has emerged as a key technology in this transformation, enabling the automation of repetitive tasks that traditionally consume valuable time and resources. This technology has gained attention as enterprises pursue digital transformation strategies aimed at enhancing financial accounting efficiency and accuracy (Yao, 2024; (Hazar & Toplu, 2023). By automating transactional processes, organizations can redirect human resources towards more complex and strategic functions, thereby driving added value (Hazar & Toplu, 2023). For instance, studies indicate that RPA can facilitate rapid data processing, reduce the risk of human error, and ensure adherence to regulatory compliance in accounting practices (Gunawan, 2023; Gao & Zeng-jie, 2023). Moreover, the application of AI and machine learning in auditing demonstrates how these technologies can modernize traditional practices. AI technologies enhance audit efficiency by automating routine tasks and improving data analysis, significantly increasing the capabilities of auditors (Ivakhnenkov,

2023). An example is the E-Auditor, which employs machine learning algorithms to identify anomalies in tax data that may signal tax evasion, thereby enhancing audit accuracy compared to conventional methods (Rathor, 2024). In this regard, AI assists auditors in detecting errors and adapting to complex financial patterns, empowering them to conduct more effective audits (Ivakhnenkov, 2023). The digital transformation of accounting is further advanced by the integration of big data analytics, as highlighted by Zhu, who discusses how the combination of AI with big data equips organizations with essential tools for comprehensive financial analysis, allowing them to derive actionable insights from extensive datasets (Zhu, 2023). Such advanced analytical capabilities are vital for decision-making, strategic forecasting, and performance evaluation, strengthening the role of AI in contemporary accounting practices. Additionally, the adoption of AI-driven technologies provides firms with competitive advantages, not only enhancing operational efficiency but also functioning as a strategic necessity to maintain relevance in an increasingly technology-driven accounting environment (Гнатюк et al., 2023). Successful integration of AI and RPA enhances interdepartmental collaboration and responsiveness to market demands, exemplifying a holistic approach to accounting modernization (Liu et al., 2023). The intersection of AI and robotics in accounting signifies a profound evolution in methodologies and practices. As organizations continue to leverage these technologies, the landscape of financial management is anticipated to evolve, leading to more streamlined, accurate, and strategic accounting functions.

3. Methodology

This study employed a quantitative research design to investigate the transformative impact of Artificial Intelligence (AI) on accounting practices and professional skills. A cross-sectional survey was chosen because it provides a snapshot of accountants' perceptions and experiences at a particular point in time, making it suitable for understanding how practitioners are adapting to the digital shift (Creswell & Creswell, 2018). The purpose of this design was not only to measure the extent of AI adoption in accounting but also to capture how this adoption influences the demand for new technical and soft skills in the profession. The population of the study consisted of professional accountants and auditors working across both the public and private sectors. To ensure the inclusion of individuals with relevant exposure, a purposive sampling strategy was applied, targeting those who had at least some interaction with AI-based tools such as robotic process automation (RPA), automated auditing platforms, and data analytics software. The final sample comprised N = 289 respondents, representing a diverse mix of practitioners from multinational firms, small and medium-sized enterprises (SMEs), and government audit institutions. This diversity allowed the study to explore variations in AI adoption and skill transformation across organizational contexts.

Data were collected using a structured questionnaire that was adapted from previous research in accounting and auditing (Issa et al., 2016; Pan & Seow, 2016; Richins et al., 2017). The instrument was divided into three main sections. The first section captured demographic information such as age, gender, education, and years of experience. The second section examined the extent of AI adoption in accounting processes, while the third section focused on the transformation of skills, including both technical competencies (e.g., programming, statistical analysis, and data visualization) and soft skills (e.g., problem-solving, communication, and ethical judgment). All items were measured on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree," which allowed for the quantification of perceptions and facilitated statistical analysis. Once the data were collected, they were coded and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were first used to summarize demographic characteristics and provide an overview of AI adoption trends among respondents. To test the study's hypotheses, inferential statistics were employed. Correlation analysis was used to explore the association between AI adoption and the demand for new competencies, while regression analysis was conducted to examine the predictive power of AI adoption on the transformation of accounting skills. These statistical techniques enabled the study to go beyond descriptive observations and identify meaningful relationships between variables. Throughout the research process, ethical considerations were carefully observed. Participation was voluntary, informed consent was obtained from all respondents, and anonymity

was maintained to ensure confidentiality. The findings were reported with transparency and without bias, in line with established ethical guidelines for business and social science research (Bryman & Bell, 2015). Such ethical rigor not only enhances the reliability of the study but also reflects the importance of integrity when conducting research on emerging technologies that themselves raise ethical concerns.

4. Results and Discussion

The data from 289 respondents offered robust evidence regarding the relationship between AI adoption and the transformation of accounting skills. As reported earlier, descriptive results showed that the majority of accountants have begun integrating AI-enabled tools into their work, with clear implications for both technical and soft skill requirements. Correlation analysis indicated a strong positive association between AI adoption and skill transformation ($r = .61$, $p < .01$), suggesting that greater exposure to AI technologies is linked to increased demand for new competencies. To further validate this relationship, a regression analysis was conducted. AI adoption was entered as the independent variable, while skill transformation served as the dependent variable. The model proved to be statistically significant ($F(1, 287) = 112.46$, $p < .001$), explaining 37% of the variance in skill transformation ($R^2 = .37$). The results confirmed that AI adoption is a significant predictor of skill transformation ($\beta = .47$, $t = 10.61$, $p < .001$). These findings suggest that as organizations integrate AI into accounting systems, the profession increasingly requires hybrid skillsets that combine technical knowledge (e.g., data analytics and programming) with human-centered competencies (e.g., ethical reasoning and communication). The results are consistent with global trends highlighted by ACCA (2020), which emphasize the need for accountants to evolve into strategic advisors in a data-driven economy. However, the results also bring attention to a significant gap in training. Although respondents acknowledged the ethical challenges associated with AI, including algorithmic bias and privacy concerns, only 46% reported receiving formal training in responsible AI use. This highlights a disconnect between technological adoption and governance frameworks. Addressing this issue will require collaborative action from policymakers, universities, and professional bodies to develop curricula and training programs that integrate ethical AI principles into accounting education and practice.

Table 1: Descriptive Results of AI Adoption and Skill Transformation (N = 289)

Variable	Mean (M)	Std. Deviation (SD)	% Agreement (Agree/Strongly Agree)
Use of AI tools in accounting	3.92	0.84	72%
Importance of data analytics	4.28	0.67	81%
Importance of programming skills	3.76	0.91	64%
Importance of soft skills	4.35	0.58	85%
Concern about ethical issues	3.89	0.79	70%
Training in ethical AI	2.61	0.93	46%

Note. Scale ranges from 1 = strongly disagree to 5 = strongly agree.

Table 2: Regression Analysis Predicting Skill Transformation from AI Adoption (N = 289)

Predictor	B	SE B	β	t	p
(Constant)	1.84	0.21	–	8.76	< .001
AI Adoption	0.62	0.06	.47	10.61	< .001

Model Summary: $R = .61$, $R^2 = .37$, Adjusted $R^2 = .36$, $F(1, 287) = 112.46$, $p < .001$

Note. Dependent variable: Skill Transformation. B = unstandardized coefficients; β = standardized coefficients.

The estimation results support the notion that AI adoption is an essential predictor of changes in demand for accounting skills. More specifically, for each one-unit increase in AI adoption, skill transformation increased by 0.62 units after controlling for other confounding factors. This result suggests that accounting is no longer just automating dated processes but is becoming something that demands a much broader set of competences from a profession. This supports the general view that organizations need to invest in reskilling and upskilling initiatives to prepare accountants for the future of AI. Without formal education in both

technical and ethical practices, the profession faces an expanded skills gap and increased governance risk." These results suggest a pressing need for AI literacy and ethics training to be integrated into an accounting curriculum as a foundational component to foster sustainable and responsible digital transformation.

5. Conclusion and Recommendations

This study set out to examine how Artificial Intelligence (AI) is reshaping the accounting profession, with a particular focus on the transformation of professional skills. Drawing on the responses of 289 accountants and auditors, the findings demonstrate that AI adoption is no longer limited to automating routine tasks but is actively redefining the competencies required to succeed in the digital economy. The results confirmed a significant and positive relationship between the use of AI-enabled tools and the demand for new skillsets, highlighting the growing importance of technical competencies such as data analytics and programming alongside soft skills including critical thinking, communication, and ethical judgment. The implications of these findings are multifaceted. From an organizational perspective, companies must recognize that investing in AI infrastructure alone is insufficient; equal attention must be given to developing human capital. Training programs and professional development initiatives should be designed to equip accountants with hybrid skillsets that blend technical expertise with ethical awareness. Without such initiatives, organizations risk creating a digital divide in which AI adoption outpaces the workforce's capacity to adapt. From a policy perspective, regulators and professional bodies need to establish robust frameworks that ensure the responsible use of AI in accounting and financial services. Concerns about algorithmic bias, data transparency, and privacy require urgent attention. The study revealed that only 46% of respondents had received formal training in ethical AI, underscoring the importance of integrating governance and accountability mechanisms into both professional standards and educational curricula. International bodies such as IFAC, alongside local associations, can play a crucial role in setting global benchmarks for ethical AI in accounting. The results also have broader implications for the integration of AI with emerging financial technologies (FinTech), including blockchain and digital currencies. As AI and FinTech converge, new opportunities will arise for more transparent, efficient, and sustainable financial ecosystems. However, this convergence also introduces risks that demand careful regulation, particularly in developing economies where digital infrastructures may be less mature. By promoting cross-disciplinary collaboration between accountants, technologists, and policymakers, societies can ensure that AI-driven innovations contribute not only to economic efficiency but also to sustainability and inclusivity. Finally, the study contributes to global debates on the future of work by providing evidence from a developing economy context. While much of the existing literature focuses on advanced economies, these findings highlight the unique challenges and opportunities faced by emerging markets. Addressing the skills gap in such contexts requires a tailored approach that considers resource constraints while leveraging AI for long-term capacity building. Thus, AI represents both a challenge and an opportunity for the accounting profession. To fully harness its potential, stakeholders must balance technological adoption with human development, ethical safeguards, and sustainable practices. Only through such a balanced approach can AI be positioned not merely as a tool of automation, but as a catalyst for innovation, inclusivity, and responsible growth in the global digital economy.

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