



Technological dependency, algorithmic biases, and governance: Challenges of artificial intelligence in modern accounting

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Abstract: The rapid advancement of Artificial Intelligence (AI) has profoundly influenced various industries, including accounting, by automating repetitive tasks, improving data accuracy, and facilitating strategic decision-making. This paper comprehensively analyzes AI's implications for the accounting profession, highlighting both opportunities and potential risks. While AI adoption optimizes efficiency and encourages innovation, it raises concerns like job displacement, ethical dilemmas, algorithmic transparency, and data security challenges. Through a multidisciplinary approach, the study examines the necessity of developing strong ethical frameworks, enhancing professional competencies, and promoting cross-sector collaboration to address these risks. The findings emphasize the importance of balanced AI integration to ensure transparency, ethical practices, and sustained professional relevance in an increasingly digital world landscape.

Keywords: Artificial Intelligence; Accounting; Automation; Ethical Challenges; Data Governance.

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1. Introduction

In the current context of technological transformations, the emergence of Artificial Intelligence (AI) has redefined practices and competencies across multiple sectors, including accounting. These technologies have proven to be essential tools for automating processes, enhancing accuracy in financial management, and optimizing strategic decision-making. However, significant risks arise alongside these opportunities, such as job displacement, technological dependency, and ethical challenges related to privacy, transparency, and fairness in algorithm use. This article provides a comprehensive analysis of the implications of AI in the accounting profession, highlighting its benefits and potential risks to promote a responsible and ethical approach to its implementation.

1.1. Justification of the study

The advent of Artificial Intelligence in the accounting field has brought about far-reaching transformations in how financial information is collected, processed, and analyzed (Kokina & Davenport, 2017). These technologies, including machine learning algorithms and advanced automation systems, can significantly reduce the time needed for repetitive tasks, allowing professionals to concentrate on higher-value strategic activities (Moffitt et al 2018).

In this context, the need arises to assess the risks associated with the widespread implementation of AI in the accounting profession. While the opportunities for improving productivity and the quality of information are undeniable, threats such as job displacement,

excessive reliance on technological solutions, and ethical challenges related to using sensitive data also emerge (Heath, 2019). Furthermore, discussions surrounding algorithm transparency and governance are becoming increasingly relevant to the quality of financial information and the accountability of accountants (Hussin et al., 2024).

Therefore, this study is justified by the need to provide a comprehensive perspective on AI's potential negative impacts on the accounting profession. It aims to offer a concise analysis to guide professionals and stakeholders in making decisions based on the responsible use of this technology (Aburous, 2019; Rabbani, 2024).

1.2. Objective and scope of the article

The primary objective of this article is to identify and analyze the risks that AI poses to the accounting profession, focusing on threats that may arise both at the individual level (skills and employability) and the organizational level (ethics, governance, and information security). To this end, the article reviews the most recent research and recommendations on process automation, its impact on job stability, and ethical considerations related to AI.

The scope of this article is exploratory and descriptive, as it aims to outline the key risk factors and their implications for accounting practice without attempting to exhaustively address the complexity of potential contextual variables (Kokina & Davenport, 2017; Moffitt et al., 2018). The study draws on academic literature, reports from international organizations, and regulatory references to support its reflections and conclusions. While acknowledging

the numerous benefits associated with AI adoption, this document emphasizes the challenges and safeguards required to minimize the adverse impact of its implementation.

2. Evolution of AI in accounting

2.1. The current landscape of AI in the financial sector

The adoption of Artificial Intelligence (AI) has accelerated in the financial sector, driven by the availability of large volumes of data and advancements in machine learning algorithms (Harmon & Psaltis, 2021; Kabza, 2020). Various banking institutions, insurance companies, and brokerage firms are integrating AI solutions to optimize risk assessment processes, detect fraud, and develop market prediction models (Guo, 2016).

From a regulatory perspective, international organizations such as the Financial Stability Board (FSB) have highlighted the need to balance technological innovation with financial stability, recognizing the potential impact of improper algorithmic use on the formation of speculative bubbles or the amplification of systemic risks (Harmon & Psaltis, 2021; Kabza, 2020). In line with this, the IFRS Foundation notes that digital transformation in the financial domain requires the development of new regulatory frameworks that account for the complexity of AI and its effects on the reliability of financial information (Černevičienė & Kabašinskas, 2024; de Almeida et al., 2021; Munoko et al., 2020).

On the other hand, the rapid expansion of AI in the financial environment also presents challenges regarding cybersecurity, personal data protection, and operational risk management. Handling large volumes of sensitive data, coupled with the increasing digital interconnection of financial institutions, exposes the system to vulnerabilities that necessitate a comprehensive governance and oversight approach (Guerrero et al., 2024; Javaheri et al., 2024).

In this scenario, AI emerges as a technology capable of automating processes and improving efficiency and as a disruptive force that calls for a redefinition of professional competencies and the adoption of robust ethical frameworks. Such frameworks must ensure algorithmic transparency and safeguard the interests of end users (Černevičienė & Kabašinskas, 2024; de Almeida et al., 2021; Guerrero et al., 2024; Javaheri et al., 2024; Munoko et al., 2020).

2.2. Main applications in accounting processes

AI applications in accounting primarily focus on automating repetitive tasks and enhancing information quality through advanced analytical algorithms (Moffitt et al., 2018). The following are the key areas where AI is driving the most significant transformations:

1. **Data Processing and Classification:** Using optical character recognition (OCR) tools and machine learning algorithms allows for automatically classifying invoices, receipts, and other accounting documents. This automation reduces the risk of human error, increases processing speed, and frees professionals to perform more analytical tasks (Kokina & Davenport, 2017).
2. **Automated Controls and Reconciliations:** AI facilitates the detection of discrepancies in financial information by analyzing large volumes of transactions. Algorithm-based reconciliation systems can more accurately identify anomalous patterns and issue early alerts regarding potential fraud or accounting inconsistencies (Černevičienė & Kabašinskas, 2024; Munoko et al., 2020).
3. **Smart Auditing:** Robotic Process Automation (RPA) technologies and machine learning models directly impact audit work by expediting the review of large datasets and reducing the need for sampling. This contributes to continuous, real-time auditing, enhancing audit conclusions' efficiency and reliability (Moffitt et al., 2018).
4. **Predictive Analysis and Decision-Making:** AI enables the creation of financial forecasting models based on historical patterns and macroeconomic variables, providing accountants and top management with more accurate information for strategic decision-making. Moreover, its capacity to process unstructured data—such as news or social media—offers a broader perspective on factors that may affect an organization's financial health (Guo, 2016).
5. **Fraud and Risk Detection:** Advanced algorithms help identify unusual activities that may indicate accounting fraud or money laundering. By employing data mining and network analysis techniques, multiple transactions can be correlated and flagged as deviating from the norm, reducing response time and the financial impact of such events (FSB, 2017).

In sum, AI applications in accounting yield positive outcomes regarding efficiency and information quality, although they necessitate rethinking the accountant's role toward more strategic and analytical tasks. This paradigm shift also entails additional responsibilities in ethics, governance, and data protection, which will be addressed in detail in subsequent sections (de Almeida et al., 2021; Guerrero et al., 2024; Javaheri et al., 2024).

3. Potential risks to the accounting profession

3.1. Job displacement and role reconfiguration

Incorporating Artificial Intelligence into the accounting domain has significantly changed the demand for professional competencies. According to Guo (2016), the automation of routine, repetitive tasks reduces the need for human labor in certain processes, particularly those involving large-scale data processing. Consequently, there is growing concern about job displacement in areas traditionally occupied by accounting assistants or junior analysts.

One illustrative case is that of a large financial services firm studied by Moffitt et al. (2018), which implemented Robotic Process Automation (RPA) systems—similar to those described by Faúndez-Ugalde et al. (2020)—to automate the initial review of invoices and the reconciliation of accounts payable. This implementation reduced the time spent on these tasks by 40%, allowing some staff members to be reassigned to consulting and internal control roles. While adopting these technologies eliminated strictly operational positions, it also created new professional development opportunities for those who acquired skills in data analysis and the oversight of AI systems (Bone et al., 2023).

In this regard, the reconfiguration of roles in the accounting profession becomes more salient as expertise in areas such as predictive analytics, data ethics, and automated process design is increasingly in demand (Kokina & Davenport, 2017). Accountants who adapt to these requirements can take on more strategic responsibilities, offering guidance on interpreting AI-generated results and contributing to high-level decision-making.

3.2. Technological dependency and potential system failures

The growing reliance on AI solutions in accounting raises concerns about technological platforms' robustness and reliability. The Financial Stability Board (FSB, 2017) warns that by delegating critical processes to algorithms and automated systems, organizations become particularly vulnerable to potential technological failures, cyberattacks, or disruptions in digital infrastructure (Fredy & Chura, 2023; Tigselema-Egre et al., 2024).

A pertinent example involved a multinational manufacturing company whose accounting department relied on predictive analytics software for cash flow projections (Olakunle Babatunde Alao et al., 2024). After a failed system update, the projection module was compromised, producing erroneous estimates that adversely affected the company's financial planning for several weeks. Although the issue was eventually resolved, the incident highlighted the need for contingency plans and manual verification protocols for system failures.

A lack of human oversight and excessive trust in AI can exacerbate the impact of a system failure. For this reason, it is crucial to define backup mechanisms that enable the safe continuation of accounting operations and train staff to detect anomalies in algorithm performance.

3.3. Privacy, data security, and cyberattacks

AI solutions handling sensitive financial information heighten privacy and data protection challenges. Confidential data from clients, employees, and suppliers is routinely processed in the accounting field, making AI systems an attractive target for cyberattacks (Tigselema-Egre et al., 2024).

A paradigmatic case involved a well-known financial services company that used machine learning algorithms for credit evaluations and whose database was breached by hackers (Modarres et al., 2018; Zheng et al., 2020). The breach exposed the personal information of thousands of applicants and undermined the predictive models' credibility, given the potential manipulation or theft of key information needed for their functionality.

Many organizations have strengthened their security protocols to mitigate these risks, incorporating advanced encryption, network segmentation, and periodic technological audits (Tigselema-Egre et al., 2024). Implementing data governance policies that regulate access to information, limit the unauthorized exploitation of records, and promote transparency regarding the use of algorithms in accounting classification and analysis is also essential.

3.4. Algorithmic biases and ethical dilemmas

AI relies on learning algorithms that frequently derive patterns from large historical datasets (Kokina & Davenport, 2017). This methodology can lead to algorithmic biases when training data contain prejudices or uneven representations of reality (Cowgill et

al., 2020; Munoko et al., 2020). Although much of the public debate on biases has focused on recruitment and credit issues, accounting is not exempt from such challenges (Lehner et al., 2022).

A globally recognized example was Amazon's hiring tool, which was found to favor male candidates due to biases in historical hiring data (Dastin, 2022). After discovering this tendency, the company discontinued the tool, illustrating the importance of implementing human oversight and validation mechanisms in AI processes.

In accounting, biases may surface in expense classification, inventory valuation, or client risk assessment (Moffitt et al., 2018). To address these ethical dilemmas, companies must establish clear criteria for transparency and accountability and maintain multidisciplinary teams that continuously audit the algorithms' performance (Guo, 2016; Rabbani, 2024). Ultimately, accountants are responsible for ensuring that AI-assisted financial decisions uphold the profession's principles of objectivity and integrity.

4. Mitigation and adaptation strategies

4.1. Training and development of new competencies

Incorporating Artificial Intelligence into accounting demands a reassessment of professional competencies to ensure that accountants can integrate and interpret data generated by intelligent systems (Kokina & Davenport, 2017). Beyond mastery of technological tools, a multidisciplinary approach is required, encompassing skills in data analysis, critical thinking, ethics, and effective communication (IFAC, 2020).

For example, a global auditing firm implemented a training program focused on data analytics and machine learning for its accountants. As part of this program, professionals underwent training modules ranging from an introduction to expense classification algorithms to data visualization software (Moffitt et al., 2018). After six months, the firm recorded notable improvements in detecting accounting discrepancies and preparing predictive audit reports, thanks to auditors' enhanced understanding of how algorithmic models operate.

Such initiatives foster a cultural shift within organizations, encouraging continuous learning and sparking curiosity about new technologies (Guo, 2016). By having personnel specialized in AI, companies can anticipate potential design or usage issues with algorithms and more efficiently leverage opportunities for automation and advanced data analysis.

4.2. Implementation of ethical and governance frameworks for AI

Integrating AI into accounting processes involves adopting technological tools and establishing frameworks for responsible use (Dell et al., 2024). These frameworks address the definition of ethical principles, the assignment of responsibilities, and the regulation of technical aspects, such as data collection and processing.

For example, a major accounting software company developed an "Algorithmic Ethics Code," which set guidelines regarding transparency in designing AI models and protecting clients' data (Dell et al., 2024). This code included internal audit procedures to regularly verify algorithm performance and ensure no biased

results were produced. The company invited independent experts to audit its systems and certify compliance with the code's guidelines, enhancing end-user confidence.

AI governance also requires the involvement of multiple stakeholders (regulators, developers, and accounting professionals, among others) in designing clear standards that promote transparency and accountability (Lam et al., 2024; Percy et al., 2021). This entails creating committees or specialized teams to oversee the ethics of algorithms from the training phase through daily implementation (Dell et al., 2024; Lehner et al., 2022; Munoko et al., 2020). By establishing a solid regulatory framework for AI, organizations can mitigate legal and reputational risks while reinforcing the integrity of the financial information produced.

4.3. Collaboration with other professionals and disciplines

The inherent complexity of AI—encompassing statistics, computer science, mathematics, and legal considerations—makes joint efforts between accountants and other professionals indispensable (Kokina & Davenport, 2017). For instance, data science specialists can offer deeper insight into algorithms, while legal experts can provide guidance on privacy and data protection.

For example, an international bank implementing a continuous AI-based auditing project assembled a multidisciplinary team that included accountants, software engineers, data scientists, and lawyers specialized in financial regulations (Moffitt et al., 2018). This initiative ensured that machine learning algorithms were designed ethically and complied with the confidentiality standards required by the country's regulatory bodies. The outcome was a real-time transaction monitoring system with a much higher anomaly detection rate than traditional manual processes.

This collaborative approach helps prevent knowledge fragmentation and facilitates the development of comprehensive solutions that address system efficiency and accuracy, data protection, legal liability, and algorithmic transparency (Hacker et al., 2022). By involving different disciplines, organizations improve their capacity to respond to potential risks and strengthen the quality of the accounting information they produce.

5. Conclusions

The emergence of Artificial Intelligence in accounting has marked a turning point in how financial information is processed, analyzed, and presented. Its benefits are evident: automating repetitive tasks, optimizing workflows, and improving records' accuracy. Nonetheless, it is essential to acknowledge that these technological advances also bring forth challenges and risks that can affect the very essence of the accounting profession. One notable challenge involves redefining the accountant's role—no longer confined to operational tasks, accountants must now take on strategic and advisory responsibilities while acquiring advanced competencies in data analysis and emerging technologies.

One of the primary risks is job displacement. Automating routine processes may reduce the need for personnel in tasks previously performed manually, causing concern among professionals who fear their job security is at stake. However, the emergence of new areas focusing on algorithm oversight and design, information quality management, and advanced data interpretation presents opportunities for redeployment and professional growth. Hence,

rather than eliminating jobs, AI is shaping a landscape where accountants must shift their skills toward comprehensive advisory services, decision-making, and analytical auditing.

Another critical aspect is the strong technological dependence that comes with adopting AI in accounting processes. When organizations place excessive trust in automated algorithms, they significantly increase the risk of system failures or cyberattacks that could compromise financial information. Any disruption in digital infrastructure or improper data manipulation can result in severe economic and reputational consequences. Consequently, it is crucial to develop contingency plans and ensure constant human oversight to verify that AI tools function correctly. A robust technological infrastructure, coupled with security policies and verification protocols, mitigates these risks and upholds the reliability of information.

Privacy and data security also stand out as major concerns in the use of AI. Handling large volumes of sensitive information and the interconnection among various departments and platforms necessitates strict protective measures and access controls. Any security breach can expose clients' confidential data, inflict irreparable harm on a company's reputation, and, in the worst-case scenario, facilitate the manipulation of accounting records for fraudulent purposes. Consequently, organizations and accounting professionals must understand data management's ethical and legal implications, implement best practices, and foster a culture of responsible AI governance.

Moreover, it is vital to underscore the risk of algorithmic biases and the ethical dilemmas that can arise when AI models rely on incomplete or skewed historical data. Inadequately trained AI may perpetuate discrimination or establish classification criteria that favor certain entities or clients unfairly. Accountants must, therefore, supervise and audit the algorithms in use, ensuring objectivity and fairness in financial resource allocation, risk assessments, and the preparation of financial statements. In this regard, the professional responsibility lies in guaranteeing that decisions, even if supported by AI tools, adhere to ethical principles and the standards of integrity and accuracy in financial reporting.

In light of these risks, the key is to integrate efforts to develop multidisciplinary competencies, establish robust ethical frameworks, and foster collaboration with other professionals. The future of the accounting profession will hinge on stronger ties with data scientists, IT experts, and legal specialists and on adopting a continuous learning mindset. Accountants must transcend the mere interpretation of financial statements to become agents of change, capable of spearheading innovation projects and ensuring transparency in every process where AI plays a leading role.

In conclusion, AI provides invaluable opportunities to transform and enhance the quality of accounting services—provided that the associated risks are appropriately addressed. The profession's survival in this highly digitized environment depends on accountants' capacity to evolve, embrace new roles, and establish control and governance mechanisms that safeguard ethical standards and information security. Only through a comprehensive and responsible vision can the incorporation of AI lead to a genuine competitive advantage and a more transparent, efficient accounting practice aligned with the demands of an ever-changing business landscape.

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