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ROLE OF ARTIFICIAL INTELLIGENCE ON ACCOUNTING PRACTICES OF SMEs IN RWANDA SPECIAL ECONOMIC ZONE, KIGALI (2021-2024)

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Abstract

Artificial intelligence has had its role on accounting practices such as; cost efficiency, accuracy and error reduction in private organizations. This study examines the integration of Artificial Intelligence (AI) into accounting practices within medium and large private organizations in Rwanda, highlighting its impact on efficiency, accuracy, and associated challenges. Focusing on 149 organizations sampled out of 243 organizations targeted, the research reveals that AI adoption is universal (100%), with technologies such as Robotic Process Automation (RPA), Machine Learning (ML), and Natural Language Processing (NLP) widely implemented. Their applications include data entry (95.7%), transaction processing (92.1%), reconciliation (88.6%), and financial analysis (85%). The findings demonstrate notable benefits: operational efficiency improved through cost reductions ranging from 10% to 50%, error minimization, reduced duplication, and enhanced compliance. Furthermore, AI adoption enabled staff redeployment toward more strategic, value-adding tasks. Nevertheless, organizations face significant challenges. High implementation costs (78.6%), shortages of skilled personnel (72.9%), data security concerns (65%), and inadequate infrastructure (59%) emerged as critical barriers, alongside regulatory uncertainty. In response, firms employed strategies such as phased AI integration, specialized staff recruitment, workforce training, and the establishment of data protection policies. The paper underscores the need for broader support mechanisms, including access to local AI service providers, financial incentives, and capacity-building initiatives. Overall, the research confirms that AI enhances both operational and strategic accounting functions in Rwanda, while stressing the importance of addressing financial, technical, and regulatory limitations to fully realize its potential. The study recommends that organizational leaders should develop structured AI adoption strategies aligned with business goals and resources; policymakers should introduce incentives such as tax relief and grants; and educational institutions should strengthen AI literacy and practical accounting applications.

Keywords: Artificial Intelligence, Accounting practices, Private organization, cost Efficiency and Accuracy.

Introduction

In recent years, Artificial Intelligence (AI) has significantly transformed various industries, including accounting and finance. Once characterized by manual and linear workflows, accounting practices have evolved through the integration of AI, which offers unmatched speed, accuracy, and efficiency. AI has become an essential tool for modern business operations, streamlining processes and enabling faster, data-driven decision-making (Beryl O., et al., 2024).

AI's impact on accounting is substantial, reshaping traditional tasks like bookkeeping and reporting. Accountants now use AI tools for forecasting, cash flow management, workflow automation, email and inbox management, invoice and expense processing, data analysis, and communication (Huiquan J. et al., 2023). These tools not only save time but also enhance accuracy, reduce human error, and allow professionals to focus on strategic tasks rather than routine processes (Tandiono, 2023). This marks a major shift in the role of accountants, expanding their value beyond compliance to include business advisory and insight generation (Vandepuye S., et al., 2024). Globally, AI is no longer just a trend but a critical force of innovation. Even traditionally conservative fields like accounting are embracing AI to redefine operations, client engagement, and service delivery (Eziefule A.O., et al., 2024). AI's adoption brings cost savings, greater efficiency, and competitive advantage, especially by automating repetitive and labor-intensive tasks such as data entry (Monigha, 2024).

In Africa, AI is gaining momentum as a driver of economic transformation. Countries across the continent are investing in AI-friendly policies, infrastructure, and education to harness its potential (Azaroual, 2024). Rwanda, in particular, is emerging as a regional leader in AI adoption. The Rwandan financial sector, especially digital banks, is increasingly integrating AI for financial reporting, auditing, and customer service. Most commercial banks in Rwanda (excluding SACCOs and Microfinance institutions) use Robotic Process Automation (RPA) for automating tasks like transaction processing and compliance reporting, leading to lower operational costs and improved efficiency (BNR, 2024).

Rwanda's commitment to digital innovation is reflected in its national AI policy, developed through collaboration between the Ministry of ICT and Innovation, international partners, and local tech stakeholders. This policy aims to support economic growth, inclusive development, and public sector innovation (MICT, 2023). Rwanda's Vision 2050 positions the country as a leader in digital transformation, with AI playing a critical role across both public and private sectors.

However, challenges remain, particularly for small states and micro, small, and medium enterprises (MSMEs) that often lack the resources and technical capacity to implement AI. The *AI Playbook for Small States* emphasizes the need for targeted strategies, government support, and focused research especially within medium and large private organizations, to guide effective AI integration (AI Playbook, 2024).

In conclusion, AI is revolutionizing accounting and financial reporting by automating tasks, reducing errors, improving decision-making, and enhancing efficiency. Rwanda exemplifies how a forward-looking approach and supportive policies can foster AI adoption, even in resource-limited settings. Ongoing research and investment are necessary to support broader adoption, especially among private enterprises and MSMEs (Rwigema, 2020).

Problem Statement

Artificial Intelligence (AI) has the potential to revolutionize accounting practices by improving cost-efficiency, accuracy, and productivity. Globally, organizations are leveraging AI to streamline financial operations, reduce fraud risks, and enhance transparency. However, Rwanda's private sector remains at an early stage of AI adoption (Rwigema, 2020). The NISR 2023 Establishment Census indicates that Rwanda hosts over 269,000 businesses, with 95.9% privately owned, largely dominated by Micro, Small, and Medium Enterprises (MSMEs). Small and medium-sized enterprises (SMEs) play a vital role in national economic growth but face significant barriers to adopting artificial intelligence (AI). These challenges include limited financial resources, high implementation costs, and a shortage of technical expertise, which hinder their ability to leverage AI effectively. Addressing these obstacles is crucial for enabling SMEs to harness AI's potential and remain competitive in the evolving market landscape (Second Muse, 2025).

Consequently, most SMEs continue to depend on manual accounting systems that are time-consuming, prone to errors, and susceptible to fraud (Chandra et al., 2021). Although larger firms are increasingly adopting artificial intelligence (AI) because they have greater access to capital, advanced infrastructure, and specialized skills, medium-sized enterprises continue to face constraints that limit their adoption, such as limited financial resources, lack of technical expertise, and insufficient training opportunities (Monigha, 2024). Despite the increasing relevance of AI in global business operations, there is limited empirical evidence on its usage, benefits, and challenges within Rwanda's private sector accounting practices. Without such evidence, SMEs risk missing opportunities for cost reduction, efficiency gains, and improved financial transparency.

This study therefore aims to address this gap by investigating the usage of AI in accounting practices, assessing the impact of AI adoption on cost efficiency in accounting practices; evaluating the role of AI in improving accuracy and reducing errors in accounting processes; and exploring the challenges hindering AI adoption and identify possible mitigation measures within the private sector.

Literature Review

Conceptual Review

Artificial Intelligence (AI) is transforming accounting by automating repetitive tasks, lowering operational costs, and improving accuracy through technologies such as machine learning, natural language processing, and robotic process automation (Russell & Norvig, 2020). AI streamlines processes including data entry, payroll, invoice processing, compliance monitoring, and fraud detection, thereby enhancing efficiency, transparency, and reliability. However, challenges remain, particularly regarding financial costs, data quality, ethical considerations, and the risks of overreliance on algorithms (Vinuesa et al., 2020). Empirical studies highlight reductions in operational costs of up to 30% and improvements in compliance and risk management (Miller et al., 2024), while accuracy gains include reduced discrepancies and improved anomaly detection (Pavlović et al., 2024).

Global firms emphasize the transformative potential of artificial intelligence (AI) while highlighting challenges such as ethical concerns, bias, and skills gaps, particularly in emerging markets (Moloi & Obeid, 2024). In Rwanda, the private

sector has reported notable improvements in accuracy through AI adoption; however, issues of affordability and limited capacity continue to constrain widespread implementation (Mbonigaba, 2025). Additional barriers identified in the literature include cybersecurity risks, regulatory gaps, and resistance from the workforce (Moloi & Obeid, 2024). To mitigate these challenges, scholars recommend financial support mechanisms, targeted training programs, and governance frameworks that balance technological adoption with human oversight, ensuring both efficiency and accountability (KPMG, 2021; Deloitte, 2022).

Artificial Intelligence (AI) refers to the science and engineering of creating machines that can think, learn, and act like humans. As Russell and Norvig (2021) explain, AI involves designing agents that perceive their surroundings and make decisions that help them achieve specific goals. It brings together areas such as machine learning, natural language processing, and computer vision, while also drawing inspiration from how the human brain works (Nilsson, 2014). AI can be divided into narrow AI, which focuses on specialized tasks like speech recognition or data analysis, and general AI, which aims to mirror human intelligence across different activities (Poole & Mackworth, 2023). More than just a technological innovation, AI is reshaping how societies function by changing industries, influencing ethics, and transforming governance structures (Floridi & Cowls, 2019).

Theoretical Framework

This study is anchored on the Technology Acceptance Model (TAM) by Davis (1989) and the Diffusion of Innovation (DOI) Theory by Rogers (2003), both of which provide foundational insights into AI adoption. TAM emphasizes that perceived usefulness and perceived ease of use are key determinants of whether individuals accept and utilize new technologies, suggesting that AI adoption depends on users' beliefs about its benefits and simplicity. Complementing this, the DOI theory explains how innovations spread within a social system over time, highlighting factors such as relative advantage, trial ability, observability, and compatibility, which influence the rate and extent of AI adoption across organizations and industries. Together, these frameworks offer a comprehensive lens for understanding both individual and organizational decisions regarding AI implementation.

TAM emphasizes that perceived usefulness and perceived ease of use are primary determinants of user acceptance, explaining why accountants are more likely to adopt AI when it enhances efficiency and simplifies tasks. Studies by Zhou et al. (2023) confirm that training and demonstrable benefits significantly increase adoption, although TAM's limitation lies in its underestimation of social and organizational factors. DOI theory complements this by analyzing how innovations diffuse across organizations and societies, categorizing adopters and considering attributes like relative advantage, compatibility, and complexity. Research conducted in Kenya and Vietnam by Nguyen and Tran (2023) highlighted that individuals and organizations are more likely to adopt new technologies when they clearly perceive tangible benefits, such as efficiency gains or cost savings. The study also emphasized the role of trial ability, having the opportunity to test and experiment with a technology before full implementation as a critical factor influencing adoption decisions.

Empirical studies further underscore AI's transformative role in accounting. Thompson and Garcia (2023) demonstrate that AI systems, including machine learning and robotic process automation, enhance operational efficiency by automating routine bookkeeping, financial reporting, and compliance tasks. KPMG (2021) identified several advantages of artificial intelligence (AI) in auditing, including its capacity to reduce manual processes, detect anomalies more effectively, and support ethical auditing practices. Building on this, Patel and Li (2023) demonstrated that in India and China, AI applications have improved tax compliance and payroll accuracy, leading to reduced costs and fewer errors in financial management.

In the African context, Moloi and Obeid (2024) reported that AI adoption in South Africa and Nigeria has enhanced financial transparency, minimized human error, and strengthened organizational competitiveness, showing that the technology's benefits extend across both developed and emerging economies. Deloitte (2022) emphasizes that AI applications such as natural language processing, predictive analytics, and RPA reshape business operations, improve decision-making, and increase agility, although success depends on strategic alignment and workforce upskilling.

Theoretical and empirical evidence indicates that AI adoption in accounting is driven by perceived utility, ease of use, and demonstrable organizational benefits. TAM explains individual behavioral acceptance, while DOI addresses broader organizational and societal diffusion patterns. AI applications streamline processes, reduce errors, enhance compliance, and enable strategic decision-making. Despite challenges such as cybersecurity, cost, and skills gaps, AI remains critical for modernizing accounting practices in both developed and emerging markets, offering substantial improvements in operational efficiency, accuracy, and competitiveness.

Empirical Review

Thompson and Richards (2021) found that AI integration in accounting firms reduced human error in data entry and reconciliation, improving financial reliability and trust. Kim et al. (2024) showed that the use of machine learning and natural language processing (NLP) significantly improved data consistency and strengthened compliance processes by reducing errors and standardizing reporting. Similarly, Zhang et al. (2022) demonstrated that AI-assisted audits outperformed traditional audits by detecting irregularities more accurately, processing large datasets more efficiently, and enhancing overall reliability in financial oversight. Johnson and Rivera (2023) quantified a 45% reduction in discrepancies after AI adoption. Carter and Evans (2023) revealed that AI automation reduced routine tasks, lowering labor costs and redirecting resources.

Anderson and Lee (2022) reported that the introduction of AI technologies in administrative processes led to a 25% reduction in costs in the United States, largely due to automation of repetitive tasks, faster data processing, and improved resource allocation. In a similar vein, Müller and Schmidt (2023) observed a 20% decrease in administrative expenses across several European countries, noting that AI streamlined bureaucratic procedures, reduced paperwork, and minimized delays in service delivery. Extending this evidence to emerging economies, Ravi and Budi (2023) found comparable savings in India and Indonesia, where AI-driven solutions optimized workflows, reduced operational inefficiencies, and supported more

sustainable management practices. Together, these findings highlight the global relevance of AI in driving cost efficiency, demonstrating that both developed and developing economies can achieve significant administrative savings by adopting intelligent automation systems.

Okoth and Mkhize (2024) confirmed AI cuts financial losses and penalties in Africa. Smith and Tran (2023) showed AI forecasting models outperformed traditional methods, and Park et al. (2023) found AI-powered dashboards improved financial interpretation and decision-making. Oliveira and Santos (2024) demonstrated that AI-driven compliance systems play a critical role in reducing oversight risks by automating monitoring processes, detecting irregularities, and ensuring adherence to regulatory standards. Their findings suggest that such systems not only minimize human error but also strengthen institutional accountability. Complementing this perspective, Okoye and Omondi (2024) found that the adoption of AI technologies in tax administration significantly improved accuracy in Nigeria and Kenya. They noted that automated systems enhanced the precision of tax calculations, reduced fraud, and streamlined revenue collection, thereby contributing to fiscal efficiency. Similarly, Moloi and Obeid (2024) reported that AI-driven applications promoted greater transparency in both South Africa and Nigeria. Their study highlighted how machine learning tools and data analytics increased visibility in financial reporting and reduced opportunities for corruption, thereby reinforcing public trust in institutional systems. Collectively, these studies underscore AI's transformative potential in compliance, taxation, and transparency, while also demonstrating its relevance across multiple African contexts.

In Rwanda, Karangwa et al. (2021) found AI auditing improved accuracy by 40%, and Pavlović et al. (2024) highlighted predictive analytics in discrepancy detection, though OECD (2021) noted infrastructure and governance gaps. Patel and Nkosi (2024) noted SMEs struggle with AI affordability, with Mukiza and Iradukunda (2024) suggesting subsidies and loans. Brown and Sanchez (2024) found that developed economies have invested heavily in artificial intelligence (AI) training, enabling their workforces to acquire advanced digital competencies and adapt quickly to technological shifts. In contrast, Mbonigaba (2024) highlighted Rwanda's significant skills gap, noting that limited training opportunities and inadequate digital infrastructure constrain the country's ability to fully harness AI in professional sectors. To address such disparities, Ndlovu and Sibanda (2023) recommended stronger university industry partnerships, arguing that collaboration between academia and the private sector can provide relevant skills, practical training, and innovation pipelines that prepare graduates for AI-driven workplaces.

At the same time, scholars have raised concerns about the risks associated with uncritical adoption of AI tools. Smith and Lee (2022) warned that unchecked algorithmic errors can compromise accuracy and reliability in decision-making, particularly in high-stakes fields such as finance and healthcare. Similarly, Benimana and Mbonigaba (2025) reported that AI systems may produce misleading or biased outputs when human oversight is absent, emphasizing the need for continuous monitoring and accountability. Building on this, Kateryna and Sebastian (2024) advised adopting hybrid approaches that combine AI capabilities with professional judgment, arguing that such integration maximizes efficiency while safeguarding ethical and practical standards.

In all of these studies, it is evident that no study has been undertaken in the role of Artificial intelligence on Accounting Practices of SMEs in Kigali special economic zone, Rwanda specifically which created knowledge gap that this study currently explores.

Methodology

The study adopted a mixed-methods research design, integrating quantitative and qualitative approaches to examine the role of AI in accounting practices within private organizations in Rwanda. Quantitative data, collected through structured questionnaires, measured the extent of AI adoption, cost efficiency, and accuracy, while qualitative data provided deeper insights into challenges and strategies through content analysis. The target population consisted of 243 medium and large enterprises in the Kigali Special Economic Zone, chosen purposively due to their economic significance, with a sample size of 149 firms determined using Cochran's formula. A proportionate stratified random sampling technique was employed to ensure balanced representation by firm size. To enhance validity and reliability, the instruments underwent pilot testing with 30 respondents, leading to refinement of the questionnaire. Quantitative data were analyzed using SPSS through descriptive statistics, while qualitative findings were coded and thematically analyzed. This methodological approach allowed for triangulation of results, ensuring both generalizability and contextual richness while minimizing bias.

Result

The results of responses retrieved from the field are analysed and presented in this section.

The findings show that AI adoption in accounting within Rwanda's private organizations is universal, with 100% of respondents confirming use in at least some processes, indicating that AI is indispensable rather than optional. Most respondents had practical accounting experience, with 45.5% having 1-3 years and 33.6% 4-6 years, ensuring credible insights. In terms of technologies, Robotic Process Automation (RPA) was used by 100%, Machine Learning (ML) by 88.1%, Natural Language Processing by 53.8%, Predictive Analytics by 38.5%, and chatbots or virtual assistants by 18.9%. AI applications were strongest in bookkeeping, payroll, and financial reporting (100%), with lower but significant use in auditing (73.4%), tax computations (80.4%), and budget forecasting (79%). RPA was dominant in payroll, data entry, and reconciliation, with over 90% of respondents using it to reduce clerical errors and save time, while ML supported anomaly detection, cash flow prediction, and analytics. About 78% reported AI reduced report preparation time, boosting compliance and efficiency.

On cost efficiency, AI reduced operational costs by 25-50%, mainly by cutting labor for repetitive tasks and minimizing errors. 77% of respondents confirmed cost savings from automation, particularly in payroll, reconciliation, and tax preparation, which lowered penalties and overtime costs. Although initial adoption costs were noted as high, long-term savings outweighed them.

Regarding accuracy, 96% agreed AI improved precision in accounting, with 82% noting enhanced anomaly detection. Over 90% reported improved compliance and error-free reporting, while 75% observed fewer audit discrepancies. Challenges included data privacy/security (95.1%), high costs (94.4%), infrastructure gaps

(88.1%), lack of skilled personnel (72.7%), resistance to change (56.6%), integration issues (32.2%), and regulatory uncertainties (14%).

Mitigation strategies were widely reported (99.3% of firms), dominated by staff training and upskilling (94.4%) and robust data protection policies (93.7%). Other measures included hiring AI experts (35%), outsourcing (15.4%), and phased implementation (32.2%). AI adoption is 100%, cost reduction 25-50%, accuracy improvement 96%, anomaly detection 82%, and audit discrepancy reduction 75%, but firms face high costs, privacy risks, and skill gaps, with most relying on training (94.4%) and data security (93.7%) to mitigate challenges.

Discussion of the Results

Assess the Extent of AI Adoption in Accounting Practices in SMEs in Rwanda

The study found that all surveyed organizations have implemented AI technologies in their accounting operations, with Robotic Process Automation (RPA) at 100% and Machine Learning (ML) at 88.1% being the most prevalent even if Natural language processing (NLP) is used at 53.8%. AI use is widespread in tasks such as data entry, reconciliation, transaction processing, and financial analysis. The high adoption rate reflects strong perceived usefulness and operational benefits, in line with prior global studies on AI acceptance. The results demonstrate that all surveyed organizations have adopted some form of AI in their accounting processes, with Robotic Process Automation (RPA) and Machine Learning (ML) being the most widely used technologies. This finding aligns with the Technology Acceptance Model (Davis, 1989), which posits that perceived usefulness strongly influences technology adoption. The high uptake of RPA and ML suggests that these tools are perceived as offering clear operational benefits. The respondents highlighted that AI streamlines repetitive tasks, enhances the speed of processing transactions, and improves data analysis capacity.

Determining the Impact of AI on Cost Efficiency in Accounting

Findings indicate that AI has significantly improved cost efficiency in private organizations. Most respondents reported operational cost reductions of between 10% and 50%, largely due to automation of repetitive tasks, reduction in manpower needs, and better allocation of resources. AI adoption has enabled firms to reallocate staff to value adding activities, thereby improving overall productivity. A majority of respondents indicated that AI had led to measurable cost reductions, with most organizations reporting savings of between 10-50%. The reduction in operational costs can be attributed to the automation of manual processes, reduced dependence on large accounting teams, and improved resource allocation. These findings are consistent with resource-based theory, which emphasizes the importance of leveraging technological capabilities to achieve efficiency gains (Anderson and Lee, 2022). In line with the work of Muller and Schnidt (2023), the results suggest that AI technologies enable organizations to redeploy human capital towards higher-value activities, thereby improving productivity and reducing overhead expenses.

Evaluation of the Effect of AI on Accuracy and Error Reduction in Accounting

The results show that AI has enhanced the accuracy of accounting data, reducing calculation mistakes, duplicate entries, and compliance-related oversights. AI-powered systems provide real-time data validation and error detection, which

strengthens the credibility and reliability of financial reports. This improvement directly supports better decision-making and compliance with audit requirements. The study further reveals that AI significantly enhances the accuracy of accounting records, with reductions in calculation errors, duplicate entries, and compliance-related oversights. These outcomes confirm the assertions of Thompson and Richards (2021) that AI-driven accounting systems minimize human error through real-time validation and automated checks. From the perspective of information systems theory, the increased accuracy demonstrates how artificial intelligence (AI) enhances the quality, reliability, and timeliness of accounting data, thereby enabling more informed and effective decision-making (Laudon & Laudon, 2020). The alignment between this finding and previous empirical research underscores AI's role in bolstering trust in financial reports and meeting audit and compliance requirements.

AI technologies significantly improve the precision of financial records by automating repetitive and rule-based tasks. Anderson and Clark (2023) highlight that AI systems equipped with real-time data validation drastically reduce human input errors during ledger entries, reconciliations, and audit preparation. Similarly, Eziefule et al. (2024) affirm that AI minimizes inconsistencies by applying consistent logic and checks across datasets, thus improving the quality and reliability of accounting records.

Challenges Faced and the Mitigation Strategies in Adopting AI in Accounting Practices in SMEs in Rwanda

The most common challenges reported include high implementation costs, shortage of skilled personnel, data security concerns, and inadequate technological infrastructure. Regulatory uncertainty also emerged as a barrier to wider AI adoption. These constraints are consistent with both local and international research findings. Organizations have implemented various strategies such as staff training, hiring AI specialists, enforcing data protection policies, and adopting AI in phases to spread out costs and risks. These strategies have proven effective in overcoming many of the adoption barriers, particularly those related to skills gaps and cybersecurity. Despite the evident benefits, the study identifies several significant challenges hindering optimal AI implementation.

The most critical obstacles include high implementation costs, data security risks, and a shortage of skilled personnel. Inadequate infrastructure, particularly in internet connectivity, further limits AI's potential in some organizations. Earlier works emphasize that technological advancement in accounting is constrained by both financial and human capital barriers, which hinder the widespread adoption of AI in the profession (ICAEW, 2021). The presence of regulatory uncertainties also highlights the need for a robust legal framework to govern AI use in the Rwandan accounting sector (OECD, 2021). Organizations have responded to these challenges through strategies such as staff training, hiring AI experts, implementing data protection policies, and gradual or phased AI adoption. The high effectiveness rating for these strategies suggests that targeted investments in human capital and information security are pivotal in overcoming AI adoption hurdles.

The findings indicate that AI adoption in accounting is widespread in Rwandan private organizations. AI significantly improves cost efficiency, accuracy, cost saving

and error reduction. Key challenges include high costs, skilled personnel shortages, data security concerns and inadequate infrastructure. Mitigation strategies such as staff training and robust data policies are largely effective, while additional support from government and infrastructure improvements would further enhance AI adoption and performance.

Conclusion and Recommendations

Based on the findings made in this study, the study concludes that while AI adoption in Rwandan SMEs is growing, it remains uneven across industries and firm sizes. Larger firms, particularly those in finance, telecommunications, and manufacturing, tend to have more advanced AI integration due to greater financial resources, stronger digital infrastructure, and access to skilled professionals. In contrast, smaller entities often lag behind, constrained by limited budgets and inadequate technical expertise. This disparity highlights the digital divide that continues to shape organizational competitiveness in Rwanda. The findings align with the Technology Acceptance Model (Davis, 1989), which underscores perceived usefulness and ease of use as major determinants of technology adoption. Organizations with greater exposure to AI recognize its value in improving performance and therefore commit more resources to integration. However, for smaller firms, the perceived complexity and cost of AI limit adoption, reinforcing the need for supportive policies and affordable solutions tailored to their capacities.

AI adoption has been found to significantly enhance cost efficiency in accounting practices by reducing reliance on manual processes and, consequently, lowering both labor and operational expenses. Automated systems such as those used for data entry, invoice processing, reconciliations, and financial reporting streamline workflows that traditionally required significant human input and time. By replacing repetitive tasks with AI-driven processes, firms not only reduce wage-related expenses but also free staff to focus on higher-value activities such as analysis and strategic planning. Deloitte (2022) highlights that automation optimizes resource allocation, improves operational speed, and contributes to long-term financial sustainability. Bui and Gacheru (2020) caution that the cost-saving potential of artificial intelligence (AI) can only be fully achieved if organizations address key barriers, including skills shortages, high upfront investment costs, and the ongoing need for proper system maintenance. Thus, while AI enhances efficiency, the degree of impact varies depending on organizational capacity and readiness.

The findings also demonstrate that AI technologies significantly enhance accuracy in accounting practices by reducing human error, particularly in repetitive and data-intensive tasks. Processes such as data entry, reconciliation, and financial reporting are highly prone to errors when handled manually, but AI automation minimizes inconsistencies, ensures greater reliability, and enhances compliance with accounting standards. Thompson and Richards (2021) emphasize that automation and predictive tools not only reduce mistakes but also support auditors and accountants in detecting anomalies that might otherwise go unnoticed. Similarly, Laudon and Laudon (2020) emphasize that AI-driven precision improves managerial decision-making by delivering reliable financial data that supports analysis, forecasting, and performance monitoring. Beyond error reduction, AI also improves audit trails and transparency, thereby reinforcing accountability in financial

operations. However, overreliance on automated systems without human oversight may still pose risks, highlighting the need for a balanced human–machine collaboration in accounting practices.

Despite the evident benefits, private organizations in Rwanda face substantial challenges that hinder the effective adoption of AI in accounting. Among the most critical obstacles are the high costs of acquiring and maintaining AI systems, weak data protection mechanisms, and a shortage of skilled personnel capable of managing advanced technologies. Limited infrastructural facilities, particularly in smaller firms, further exacerbate these constraints, while resistance to organizational change continues to slow down the pace of adoption. These barriers often restrict firms from realizing the full potential of AI, thereby widening the gap between early adopters and those left behind. Bui and Gacheru (2020) note that these challenges are especially pronounced in developing countries, where limited financial resources and gaps in technical capacity pose major obstacles to sustainable, large-scale AI adoption. Mitigation strategies, therefore, require a multi-pronged approach, including affordable AI solutions, targeted capacity-building programs, robust regulatory frameworks on data governance, and structured change management initiatives that encourage employee acceptance and trust in AI systems.

Recommendations

The recommendation for this study is that SMEs should adopt structured AI strategies aligned with goals and resources, select suitable tools, integrate them with existing systems, provide staff training, manage change to reduce resistance, and periodically assess AI outcomes to enhance efficiency, accuracy, and decision-making while maximizing return on investment.

Policymakers should support AI adoption by offering incentives like tax relief and grants, developing national guidelines for ethical and secure AI use in accounting, and fostering a regulatory framework that promotes transparency, compliance, and collaboration, thereby encouraging innovation and building trust in automated financial systems.

Technology providers should develop AI solutions that are affordable, scalable, and user-friendly for Rwandan businesses. They should offer onboarding, technical support, and updates, while collaborating with local organizations to co-create relevant systems, promoting innovation, usability, and sustainable AI integration in the accounting sector.

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