

# Utilizing Artificial Intelligence to Enhance Customer Experience in the Banking Sector in Zambia: Opportunities and Challenges

Gladys Sakaula, Dr Clement Sinyangwe  
University of Zambia / Zimbabwe Open University

**Abstract**—This study examined the opportunities and challenges of utilising artificial intelligence (AI) to enhance customer experience in the banking sector in Zambia. The study aimed to explore the applicability of AI in improving customer experience, identify key factors influencing its successful implementation, and evaluate its impact on customer satisfaction. A mixed-methods research design was adopted, integrating both quantitative and qualitative approaches. Data were collected from 184 bank customers and 50 banking professionals across multiple Zambian banks using questionnaires, semi-structured interviews, and focus group discussions, with participants recruited through snowball sampling. Quantitative data were analysed using descriptive statistics and regression analysis, while qualitative data were analysed thematically. The findings indicate that AI is widely adopted (84.8%) and positively perceived, particularly in improving service speed (mean=4.28), ease of use (mean=4.12), and service personalization. Regression analysis revealed that trust in security (Beta=.298), speed of service (Beta=.289), ease of use (Beta=.261), and personal touch (Beta=.171) are significant predictors of customer satisfaction, collectively explaining 52.4% of the variance ( $R^2=.524$ ,  $p<.001$ ). However, concerns relating to data security, reduced human interaction, inadequate staff training, and infrastructure limitations were identified as key challenges. The study concludes that while AI has significantly improved customer experience in Zambian banks, its full potential is constrained by trust-related concerns and implementation challenges. It is recommended that banks invest in trust-building strategies, staff capacity development, and balanced human-AI service delivery models. Policymakers are also encouraged to develop clear regulatory frameworks to support responsible AI adoption in the banking sector.

**Keywords**— Artificial Intelligence, customer experience, customer satisfaction, banking sector, Zambia, opportunities and challenges, snowball sampling, AI implementation, trust in AI, mixed methods.

## I. INTRODUCTION

Artificial intelligence (AI) has become a transformative force in the global financial services industry, reshaping how banks deliver services, manage risk, and engage customers. From rule-based fraud detection systems in the 1980s to today's AI-powered chatbots, personalized alerts, and automated loan approvals, AI has progressively redefined the banking experience (Davenport & Ronanki, 2018; Rajaraman, 2014). Banks in the United Kingdom and the United States of America reportedly saved over \$447 billion through AI-related efficiencies in 2023 alone (Jameaba, 2022), underscoring the magnitude of AI's operational impact.

While the benefits of AI in banking are well-documented in developed economies, research on its impact in sub-

Saharan Africa remains limited. In Zambia, the banking sector has been actively deploying AI technologies including chatbots, automated customer service platforms, and data-driven personalization tools (Bank of Zambia, 2023). However, it remains unclear whether these deployments have meaningfully improved customer experiences, or whether systemic challenges—including digital infrastructure gaps, low digital literacy, and regulatory uncertainty—are limiting the potential of AI (Munyanyi & Goredema, 2023; Vives, 2019).

A 2020 McKinsey report indicated that 60% of banks in sub-Saharan Africa still operate on outdated legacy systems, further impeding AI integration (Jayadatta & Majeed, 2024). Furthermore, 38% of consumers globally hesitate to use AI-powered services due to data privacy and security concerns (Rabby, Chimhundu, & Hassan, 2022). These challenges are particularly pronounced in developing economies, where regulatory frameworks are still catching up with technological advancement.

Despite the growing deployment of AI in Zambian banks, there is a notable absence of empirical, locally-grounded research on how customers and banking professionals experience and perceive these systems. Most existing studies focus on North America, Europe, and Asia, leaving a significant knowledge gap regarding AI adoption in African banking contexts (Wamba, Queiroz, & Trinchera, 2021). This study addresses that gap by investigating the opportunities and challenges of AI adoption in the Zambian banking sector from the perspectives of both customers and banking professionals.

The study was guided by three specific objectives: (1) to explore the applicability of AI in improving customer experience in banks in Zambia; (2) to identify factors influencing the successful implementation of AI in banks in Zambia for enhanced customer experience; and (3) to evaluate the impact of AI adoption on customer satisfaction in banks in Zambia.

## II. LITERATURE REVIEW

The integration of AI in banking has evolved significantly over the past four decades. Early applications in the 1980s and 1990s were largely confined to back-office functions such as algorithmic trading and rule-based fraud detection (Wübbecke et al., 2016; McKinsey & Company, 2020). The 2000s marked a shift toward AI-driven customer engagement, with machine learning enabling predictive analytics for customer

segmentation and personalized marketing (Bughin et al., 2018). By the 2010s, natural language processing (NLP) and deep learning had enabled the deployment of sophisticated virtual assistants capable of providing 24/7 customer support (Davenport & Ronanki, 2018).

The academic debate on AI in banking is divided. Proponents argue that AI significantly enhances service efficiency, personalization, and accessibility, resulting in higher customer satisfaction (Bughin et al., 2018; Brynjolfsson & McAfee, 2017). Critics contend that AI lacks the emotional intelligence required for complex customer interactions, potentially creating impersonal and frustrating experiences (Lemon & Verhoef, 2016). Chui et al. (2018) warn that AI-driven decision-making may reinforce bias if training data are not carefully managed, raising ethical concerns about fairness and discrimination.

In the context of developing economies, Mhlanga (2020) observes that AI adoption in banking is still an emerging phenomenon, constrained by limited infrastructure, low digital literacy, and a significant digital divide. Only 43% of the population in low-income countries has internet access, compared to 87% in high-income countries (Mpopfu, 2024; Mhlanga, 2021). These contextual factors limit the generalizability of findings from developed markets to Zambia.

Ghandour (2021) highlights socioeconomic concerns related to AI adoption, particularly job displacement and unequal user acceptance across demographic groups. The Technology Acceptance Model (TAM) posits that perceived ease of use and perceived usefulness are key determinants of technology adoption (Davis, 1989), while Rogers' (2003) diffusion of innovations theory identifies social influence and observability as important adoption drivers. Both frameworks are relevant to understanding AI uptake in the Zambian context.

Despite extensive global research, significant knowledge gaps remain regarding AI's impact in African banking. Wamba, Queiroz, and Trinchera (2021) note the absence of region-specific studies that assess whether AI-driven banking solutions in Zambia yield similar benefits or present unique challenges. Xu and Kim (2020) further observe a lack of empirical evidence on how customers perceive AI-driven interactions beyond operational efficiency, including dimensions of trust, emotional engagement, and personalized service. This study addresses these gaps.

### III. METHODOLOGY

This study adopted a mixed-methods research design, combining both quantitative and qualitative approaches to provide a comprehensive understanding of AI's impact on customer experience in the Zambian banking sector (Creswell & Plano Clark, 2018; Masaiti, 2013). The mixed-methods approach was appropriate because AI in banking is a relatively new and evolving phenomenon, requiring both contextual insights to understand customer perceptions and numerical data to measure effectiveness.

The study population comprised customers and banking professionals across multiple Zambian banks. Due to

institutional access constraints, participants were recruited through snowball sampling—a method appropriate for hard-to-reach populations where no complete sampling frame exists (Biernacki & Waldorf, 1981; Naderifar, Goli, & Ghaljaie, 2017). Initial seed participants were identified through the researcher's personal and professional networks, and subsequently asked to refer other eligible participants.

The target sample was 250 respondents: 200 customers and 50 banking professionals. A total of 184 usable customer questionnaires were returned (response rate: 92%), and all 50 employee questionnaires were completed (response rate: 100%). Using Cochran's (1977) sample size formula at a 95% confidence level and 5% margin of error, the minimum required sample was 384 respondents; however, given the practical constraints of snowball sampling, the achieved sample of 234 was considered adequate for both quantitative analysis and qualitative depth, consistent with recommendations for mixed-methods studies (Creswell & Plano Clark, 2018).

Three data collection instruments were employed: structured questionnaires (quantitative), semi-structured interviews with 15 banking professionals (qualitative), and four focus group discussions (FGDs) with 34 customers (qualitative). Quantitative data were analysed using descriptive statistics and regression analysis in SPSS. Qualitative data from interviews and FGDs were analysed thematically following Braun and Clarke's (2006) six-phase framework.

To ensure rigour, content validity was established through expert review, and a pretest was conducted with 10 customers and 5 employees. Internal consistency was assessed using Cronbach's alpha. For qualitative data, trustworthiness was ensured through triangulation of data sources, member checking, peer debriefing, and reflexivity (Lincoln & Guba, 1985).

### IV. FINDINGS AND DISCUSSION

#### *Extent of AI Adoption*

The findings reveal a high level of AI adoption, with 84.8% of customer respondents reporting prior interaction with AI-powered banking services. The most widely used services were fraud detection alerts (75.6%) and personalized banking alerts (66.7%), followed by mobile banking chatbots (57.1%), automated loan approval (42.9%), and biometric authentication (26.3%). This hierarchy of adoption corresponds to perceived risk—informational services are adopted more readily than those requiring customers to cede control over financial decisions or share biometric data.

The majority of AI users (37.0%) fell within the 26–35 age bracket, reflecting the technology adoption literature's consistent finding that younger populations are early adopters (Rogers, 2003; Venkatesh et al., 2003). Usage rates declined progressively with age, from 92.9% among the 18–25 cohort to 65.2% among those aged 46 and above, highlighting a digital divide that requires

targeted intervention. Banking professionals were predominantly from customer service (36.0%) and IT (24.0%) departments, with 82.0% directly involved in AI

implementation, lending credibility and expertise to their responses.

#### *Applicability of AI in Improving Customer Experience*

Thematic analysis of interviews and FGDs yielded four major themes regarding AI's applicability: (1) Accessibility and Convenience, (2) Personalization of Banking Services, (3) Efficiency and Speed of Service Delivery, and (4) Trust and Confidence in AI Systems.

Regarding accessibility and convenience, participants consistently highlighted the value of 24/7 service availability and the elimination of geographical barriers. A banking professional noted that AI systems handle over 40% of all customer interactions outside normal banking hours, while customers described the ability to bank at night, block lost cards on weekends, and access services from rural areas as transformative. A farmer 80 kilometres from the nearest branch stated: "Before, I would lose a full day traveling just to do simple banking. Now I use the app." These findings align with Davenport and Ronanki's (2018) observation that AI-powered systems fundamentally change the bank's value proposition.

On personalization, AI's ability to analyse transaction patterns and offer tailored product recommendations created strong emotional resonance among customers. One customer stated: "The bank suggested an education savings plan because it saw I was paying school fees regularly. It felt like the bank was looking out for me." A Product Development Manager confirmed that AI-driven recommendations had increased conversion rates by 35%, supporting Bughin et al.'s (2018) assertion that AI enhances personalized marketing. This finding challenges Lemon and Verhoef's (2016) critique that AI is inherently impersonal, demonstrating that relevance and accuracy can create an emotional connection even without human intervention.

Efficiency gains were tangible and widely recognized. A Customer Service Manager reported that average transaction times dropped from 15 minutes to under 3 minutes for routine services, while branch queues reduced by over 50%. Customers translated these savings into personal value: a business owner described recovering two hours weekly, while a working professional obtained loan approval during a lunch break. Automated loan processing reduced turnaround from days to minutes, with employees reporting a 70% reduction in processing time while maintaining risk parameters.

Trust and confidence emerged as a nuanced theme. Initial skepticism—driven by concerns about algorithmic decision-making and data security—was often overcome through repeated positive experiences. Customers described trust as graduated, with many willing to use AI for routine transactions but unwilling to "do very large transactions through the app." This aligns with Rousseau et al.'s (1998) trust development literature and Rogers' (2003) observation that social influence—seeing peers benefit from AI—plays a critical role in adoption.

#### *Factors Influencing Successful AI Implementation*

Five major themes emerged from the analysis of factors influencing AI implementation: (1) Technological

Infrastructure, (2) Human Capital and Capacity Building, (3) Regulatory and Compliance Environment, (4) Customer-Centric Factors, and (5) Organizational Leadership and Strategy.

Privacy and security concerns were the most prominent customer-perceived barrier (mean=4.21; 83.2% agreement), with concerns increasing significantly with age (ANOVA:  $F=2.647$ ,  $p=.049$ ). A customer expressed: "I'm always worried. With all the hacking news, I wonder if my money is really safe." This validates Mithra et al.'s (2023) observation that data security concerns are a significant challenge in AI integration. The lack of personal touch was also a widely cited concern (mean=4.08; 77.2% agreement), with customers missing the relational dimensions of face-to-face banking. Notably, this concern diminished with increased AI usage, suggesting that familiarity may reduce the perceived tradeoff between efficiency and warmth.

From the employee perspective, inadequate staff training was the most commonly cited implementation barrier (56.0% identified it as the biggest challenge). An IT Manager acknowledged: "Our biggest technical challenge has been integrating AI with our legacy core banking system." Infrastructure constraints, including unreliable connectivity in peri-urban and rural areas, further complicated AI delivery. A Digital Banking Manager noted: "AI applications that require real-time connectivity don't work well in those environments." These findings are consistent with the literature's identification of legacy systems and infrastructure limitations as key barriers in sub-Saharan African banks (Jayadatta & Majeed, 2024).

Regulatory compliance emerged as both a challenge and an enabler. Participants noted that the Bank of Zambia's guidelines on digital financial services provided a framework for responsible AI deployment, but that the pace of regulatory development lagged behind technological change.

A compliance officer stated: "The central bank has issued guidelines on digital financial services, including AI applications. We must ensure our AI systems are fair, transparent, and don't discriminate against certain customer groups."

#### *Impact of AI Adoption on Customer Satisfaction*

Quantitative analysis of customer satisfaction ratings revealed that speed of service received the highest mean score (4.28; 88.6% agreement), followed by ease of use (4.12; 83.1%), issue resolution (3.78), trust in security (3.45), and preference for AI over human interaction (3.21). The relatively low scores on trust and human preference reflect persistent concerns about security and the value placed on human relationships in banking.

Regression analysis identified four significant predictors of overall customer satisfaction: trust in security (Beta=.298,  $p<.001$ ), speed of service (Beta=.289,  $p<.001$ ), ease of use (Beta=.261,  $p<.001$ ), and personal touch (Beta=.171,  $p=.003$ ). The model explained 52.4% of the variance in satisfaction ( $R^2=.524$ ,  $F=39.472$ ,  $p<.001$ ). These findings establish that while functional benefits drive satisfaction, trust in security is the single most powerful predictor—indicating that banks

must prioritize data protection and transparent communication about security measures to maximize customer satisfaction.

The regression equation can be expressed as: Satisfaction = 0.324 + 0.312(Trust in Security) + 0.278(Speed of Service) + 0.241(Ease of Use) + 0.156(Personal Touch).

A comparative analysis of customer and employee perceptions revealed close alignment on speed/efficiency (mean difference: 0.06), but a widening gap on overall satisfaction (employees more positive by 0.30) and trust/security (employees more confident by 0.47). This pattern suggests that while both groups recognize AI's functional benefits, employees underestimate the degree to which customers remain anxious about security, with important implications for communication strategy.

Qualitative findings provided rich context for these quantitative results. Three themes captured AI's impact on satisfaction: (1) Enhanced Efficiency and Convenience, (2) Improved Service Quality and Personalization, and (3) Challenges to Full Satisfaction. Customer testimonies vividly illustrated satisfaction drivers—a nurse working night shifts described 24/7 access as giving her "peace of mind," while a business owner converted from a skeptic to an AI advocate after blocking a stolen card on a Saturday night. Conversely, an elderly customer of 30 years expressed that AI, while convenient, was "cold," pleading that human tellers should never be removed entirely. A customer whose chatbot provided incorrect loan information stated: "I prepared all the wrong documents and wasted a day. I was angry. Now I double check everything with a human." These accounts illustrate that a single AI failure can erode trust built through many positive experiences.

## V. CONCLUSIONS AND RECOMMENDATIONS

This study provides empirical evidence that AI has significantly penetrated the Zambian banking sector, with an adoption rate of 84.8% among customers. The findings demonstrate that AI delivers measurable improvements in accessibility, personalization, efficiency, and service quality—benefits that are experienced by both customers and banking professionals across multiple banks. The high speed of service ratings (mean=4.28) and the 300% increase in digital account openings reported by banking professionals confirm that AI is transforming the customer journey in meaningful ways.

However, the study also reveals that AI's full potential is constrained by trust-related concerns, infrastructure limitations, inadequate staff training, and the irreplaceable value customers place on human interaction. Trust in security (Beta=.298) was the strongest predictor of satisfaction, yet only 51.6% of customers expressed confidence in AI systems' handling of their personal financial data. This trust deficit is the most critical barrier to unlocking AI's full value in Zambian banking.

The study makes several contributions to knowledge. First, it provides one of the first empirically grounded assessments of AI adoption and its customer experience impact in the Zambian banking sector, addressing a gap identified by Wamba, Queiroz, and Trinchera (2021). Second, it demonstrates that the 84.8% AI adoption rate challenges

assumptions that AI is primarily a developed-market phenomenon, confirming that African banks can achieve significant customer uptake even with infrastructure constraints. Third, the regression model identifying trust in security as the primary satisfaction driver provides actionable insights specific to the Zambian context.

Based on these findings, the following recommendations are made. Bank management should prioritise visible security enhancements and proactive communication of data protection measures to bridge the trust gap between employee confidence (mean=3.92) and customer trust (mean=3.45). Banks should also invest in comprehensive staff training programmes, given that inadequate training was identified as the most significant implementation barrier by employees. A balanced service model that maintains human service channels alongside AI—particularly for complex queries, elderly customers, and large transactions—is essential to prevent the loss of customers who value personal relationships.

Policymakers and regulators, particularly the Bank of Zambia, should accelerate the development of clear, AI-specific regulatory frameworks that address algorithmic transparency, data protection, and fair lending practices. Such frameworks would not only protect consumers but also provide banks with the regulatory certainty needed to invest confidently in AI infrastructure.

Future research should employ longitudinal designs to track how trust in AI systems evolves over time, particularly as customers accumulate more experience. Studies should also focus on the experiences of older customers and those in rural areas, who appear to be at risk of exclusion from the benefits of AI-driven banking. Further investigation into the regulatory and governance dimensions of AI in Zambian banking would also contribute significantly to the policy discourse.

## REFERENCES

- [1]. Bank of Zambia. (2023). Annual Report on Digital Financial Services in Zambia. Lusaka: Bank of Zambia.
- [2]. Biernacki, P., & Waldorf, D. (1981). Snowball sampling: Problems and techniques of chain referral sampling. *Sociological Methods & Research*, 10(2), 141–163.
- [3]. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- [4]. Brynjolfsson, E., & McAfee, A. (2017). The business of artificial intelligence. *Harvard Business Review*, 95(4), 3–11.
- [5]. Bughin, J., Seong, J., Manyika, J., Chui, M., & Joshi, R. (2018). Notes from the AI frontier: Modeling the impact of AI on the world economy. McKinsey Global Institute.
- [6]. Chui, M., Manyika, J., & Miremadi, M. (2018). What AI can and can't do (yet) for your business. *McKinsey Quarterly*.
- [7]. Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.
- [8]. Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.
- [9]. Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review*, 96(1), 108–116.
- [10]. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- [11]. Ghandour, A. (2021). Opportunities and challenges of artificial intelligence in banking. *International Journal of Information Technology*, 13, 1399–1406.
- [12]. Jameaba, M. S. (2022). Digitalization, AI, and financial services: A case for emerging markets. *Journal of Financial Regulation and Compliance*, 30(3), 289–305.

- [13]. Jayadatta, S., & Majeed, A. (2024). AI adoption in African banking: Barriers and pathways. *African Journal of Business Management*, 18(1), 21–34.
- [14]. Kabwe, R., & Banda, T. (2023). Customer service quality in Zambian banks: A digital era assessment. *Zambia Journal of Banking and Finance*, 5(2), 44–61.
- [15]. Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, 80(6), 69–96.
- [16]. Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications.
- [17]. Makumba, C., & Phiri, J. (2023). Digital banking adoption in Zambia: Challenges and opportunities. *Journal of ICT Research and Applications*, 17(1), 1–18.
- [18]. Masaiti, G. (2013). *Research methodology in education*. University of Zambia Press.
- [19]. McKinsey & Company. (2020). *The state of AI in financial services*. McKinsey Global Institute.
- [20]. Mhlanga, D. (2020). Industry 4.0 in finance: The impact of artificial intelligence on digital financial inclusion. *International Journal of Financial Studies*, 8(3), 45.
- [21]. Mhlanga, D. (2021). Financial inclusion in emerging economies: The application of machine learning and artificial intelligence in credit risk assessment. *International Journal of Financial Studies*, 9(3), 39.
- [22]. Mithra, S., Priya, R., & Senthil, V. (2023). Artificial intelligence in banking: Applications, challenges and regulatory considerations. *International Journal of Computer Applications*, 185(4), 1–9.
- [23]. Mpofo, F. Y. (2024). Artificial intelligence in banking: A review of applications and implications for financial inclusion in Africa. *African Development Review*, 36(1), 12–28.
- [24]. Munyanyi, W., & Goredema, M. (2023). Digital divide and financial exclusion in sub-Saharan Africa: An empirical analysis. *African Finance Journal*, 25(1), 34–52.
- [25]. Naderifar, M., Goli, H., & Ghaljaie, F. (2017). Snowball sampling: A purposeful method of sampling in qualitative research. *Strides in Development of Medical Education*, 14(3).
- [26]. Oyeniyi, O., Ugochukwu, C., & Mhlongo, T. (2024). AI integration in commercial banking: Perspectives from sub-Saharan Africa. *Journal of African Business*, 25(1), 1–20.
- [27]. Rabby, F., Chimhundu, R., & Hassan, R. (2022). Artificial intelligence in digital marketing: A systematic literature review. *Academy of Marketing Studies Journal*, 26(2), 1–18.
- [28]. Rajaraman, V. (2014). John McCarthy — Father of artificial intelligence. *Resonance*, 19(3), 198–207.
- [29]. Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- [30]. Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review*, 23(3), 393–404.
- [31]. Tarafdar, M., Beath, C. M., & Ross, J. W. (2019). Using AI to enhance business operations. *MIT Sloan Management Review*, 60(4), 37–44.
- [32]. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478.
- [33]. Vives, X. (2019). Digital disruption in banking. *Annual Review of Financial Economics*, 11, 243–272.
- [34]. Wamba, S. F., Queiroz, M. M., & Trinchera, L. (2021). Dynamics between blockchain adoption determinants and supply chain performance: An empirical investigation. *International Journal of Production Economics*, 229, 107791.
- [35]. Wübbeke, J., Meissner, M., Zenglein, M. J., Ives, J., & Conrad, B. (2016). *Made in China 2025: The making of a high-tech superpower*. Merics Papers on China, 2.
- [36]. Xu, C., & Kim, H. (2020). The impact of AI on customer experience in financial services: A systematic review. *Journal of Service Management*, 31(3), 353–374.
- [37]. Zhang, Y., Lu, Y., & Torres, R. (2022). Unintended consequences of AI in banking: Service gaps and customer frustration. *Journal of Consumer Affairs*, 56(1), 102–124.