

GENDER DIFFERENCES IN ACCEPTANCE OF AI-POWERED BANKING SERVICES

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ABSTRACT

The study examined gender differences in customers' acceptance of AI-powered banking services by analyzing whether male and female users differed in their perceptions and adoption intentions toward AI-enabled financial technologies. The rapid integration of artificial intelligence into banking services had transformed customer interactions through applications such as intelligent chatbots, personalized financial recommendations, automated fraud detection, and digital advisory systems. However, differences in customer perceptions, trust, perceived risk, and technological confidence continued to influence the adoption of these services. A quantitative research approach was adopted using a descriptive and cross-sectional research design. Primary data were collected from 300 banking customers through a structured questionnaire, and the responses were analyzed using SPSS. Descriptive statistics and an independent samples t-test were employed to examine gender-based differences in AI-powered banking acceptance. The findings revealed that male and female customers differed significantly in their acceptance levels, with male respondents showing higher acceptance of AI-powered banking services. The results highlighted the importance of addressing gender-specific concerns related to trust, privacy, security, and ease of use to encourage wider adoption. The study contributed to the existing literature by emphasizing gender as an important factor influencing AI adoption in the banking sector and provided practical implications for developing inclusive and customer-oriented AI banking strategies.

Keywords: Artificial Intelligence, AI-powered Banking Services, Technology Acceptance, Gender Differences, Customer Adoption, Digital Banking, Trust, Perceived Risk

INTRODUCTION

Artificial Intelligence (AI) has emerged as a transformative technology that is reshaping the financial services industry by enhancing operational efficiency, improving customer experiences, and enabling data-driven decision-making. In the banking sector, AI-powered applications such as intelligent chatbots, virtual financial assistants, fraud detection systems, biometric authentication, robo-advisors, credit scoring models, and predictive analytics have fundamentally changed how financial institutions interact with customers. Unlike traditional digital banking technologies, AI systems possess the ability to learn from customer interactions, automate complex processes, and deliver personalized financial solutions, thereby improving service quality while reducing operational costs. As banks continue to invest heavily in AI-driven innovations, customer acceptance has become one of the most critical determinants of the successful implementation of these technologies. Despite significant technological advancements, the benefits of AI can only be fully realized when customers are willing to trust and adopt AI-powered banking services. Recent empirical studies indicate that perceived usefulness, trust, perceived risk, and ease of use remain central determinants of customers' intention to adopt AI-based banking services. The banking industry has undergone unprecedented digital transformation during the last decade due to rapid technological developments, increased internet penetration, smartphone usage, and changing consumer expectations. Traditional branch-based banking has progressively

evolved into digital ecosystems where customers expect fast, secure, personalized, and seamless financial services available at any time and from any location. Artificial intelligence represents the latest phase of this digital transformation by enabling financial institutions to automate customer interactions, improve decision-making accuracy, strengthen cybersecurity, and deliver highly personalized financial products. AI-powered banking services have become particularly valuable in customer service management, fraud prevention, risk assessment, loan processing, and investment advisory, allowing banks to provide real-time solutions while simultaneously improving operational efficiency. These developments have transformed AI from a supporting technology into a strategic capability that enhances both organizational competitiveness and customer satisfaction.

Although AI offers substantial benefits to financial institutions and customers, technological advancement alone does not guarantee successful adoption. Customer acceptance remains a fundamental prerequisite for the effective implementation of AI-powered banking services. Theories such as the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Diffusion of Innovation Theory have consistently demonstrated that individuals' behavioral intentions toward adopting emerging technologies are influenced by perceived usefulness, perceived ease of use, trust, facilitating conditions, social influence, and perceived risk. However, AI introduces additional complexities beyond conventional digital technologies because it performs autonomous decision-making, processes sensitive financial data, and often operates through algorithms that are not fully transparent to users. Consequently, customers evaluate AI-powered banking not only based on its functional performance but also on issues such as data privacy, cybersecurity, explainability, fairness, and ethical use of customer information. These concerns significantly influence customers' willingness to engage with AI-enabled financial services. Among the various factors affecting technology adoption, demographic characteristics continue to play an important role in shaping customer behavior. Gender, in particular, has received considerable attention in information systems, marketing, consumer behavior, and financial technology research because it influences technology perceptions, decision-making styles, trust formation, and risk assessment. Previous studies suggest that men and women often differ in their attitudes toward technological innovation, confidence in using digital systems, and willingness to experiment with emerging technologies. While these differences have narrowed considerably due to increased digital literacy and widespread technology adoption, gender continues to influence how customers perceive the benefits and risks associated with advanced digital technologies. Consequently, examining gender differences provides valuable insights into customer acceptance of AI-powered banking services. The relevance of gender becomes particularly significant within the context of AI-powered banking because financial services involve highly sensitive personal and financial information. Customers must trust AI algorithms to perform tasks such as financial advice, loan approvals, fraud detection, transaction monitoring, and identity verification. Research has frequently reported that women tend to demonstrate relatively greater concerns regarding privacy, financial security, and perceived risk, whereas men often exhibit higher confidence in adopting innovative technologies and greater willingness to experiment with digital services. Nevertheless, contemporary research presents mixed evidence. Several recent studies indicate that women demonstrate adoption intentions comparable to men when AI-powered services are perceived as secure, transparent, and easy to use, suggesting that technological design and trust-building mechanisms can reduce gender disparities in technology acceptance. These inconsistent findings highlight the importance of further investigating gender differences specifically within AI-powered banking environments rather than general digital banking contexts.

The importance of understanding gender differences extends beyond customer behavior to broader issues of financial inclusion and equitable access to digital financial services. Governments, financial regulators, and banking institutions worldwide increasingly promote digital financial inclusion as a means of improving access to formal financial services, reducing transaction costs, and enhancing economic participation. AI-powered banking possesses enormous potential to expand financial inclusion through intelligent automation and personalized financial services. However, unequal acceptance across different demographic groups may unintentionally widen existing digital divides. If male and female customers perceive AI-powered banking differently, financial institutions may fail to achieve inclusive adoption despite technological sophistication. Therefore, understanding gender-specific acceptance patterns is essential for designing AI systems that are accessible, trustworthy, and responsive to the needs of diverse customer populations. Evidence from recent studies on digital financial inclusion also demonstrates that gender continues to influence behavioral intention toward digital banking adoption, reinforcing the need for focused investigation. From an organizational perspective, identifying gender differences in AI acceptance offers important managerial implications. Financial institutions invest substantial financial and technological resources in AI implementation to improve service quality, customer engagement, and operational efficiency. However, these investments can generate sustainable value only when customers actively adopt and continue using AI-enabled services. Understanding whether male and female customers differ in their perceptions of usefulness, ease of use, trust, and perceived risk enables banks to develop more targeted customer engagement strategies, improve interface design, strengthen communication regarding AI transparency, and implement trust-building initiatives. Such customer-centric approaches can increase technology adoption while simultaneously enhancing customer satisfaction and loyalty. Furthermore, insights into gender differences can assist policymakers in developing regulatory frameworks that encourage responsible AI deployment while protecting customer privacy and promoting equitable digital participation. Despite the rapid growth of research on digital banking, financial technology, and technology acceptance, several important gaps remain in the existing literature. First, a substantial proportion of previous studies examine internet banking, mobile banking, electronic payment systems, or FinTech applications rather than AI-powered banking services specifically. AI differs fundamentally from earlier digital technologies because it incorporates machine learning, predictive analytics, autonomous decision-making, and intelligent personalization, introducing new dimensions of trust, transparency, explainability, and ethical concerns that require separate investigation. Second, although gender has frequently been included as a demographic variable in technology adoption research, it has often been treated merely as a control variable rather than the primary focus of empirical investigation. Consequently, limited research has systematically examined whether meaningful gender differences exist in customers' acceptance of AI-powered banking services. Third, previous empirical findings regarding gender differences remain inconsistent. While some studies report that men demonstrate higher technology acceptance because of greater confidence and lower perceived risk, others conclude that gender differences have diminished due to increased digital literacy and familiarity with digital technologies. These contradictory findings suggest that gender effects may vary depending on technological context, cultural environment, financial literacy, and customer experience with AI-enabled systems. Finally, relatively few studies have investigated AI-powered banking acceptance within emerging economies, where digital transformation is expanding rapidly but customer perceptions may differ because of variations in technological infrastructure, financial inclusion, digital literacy, and socio-cultural characteristics.

In view of these gaps, the present study focuses specifically on examining gender differences in customers' acceptance of AI-powered banking services. By comparing male and female customers' perceptions regarding AI-enabled banking technologies, the study seeks to provide a deeper understanding of whether gender influences technology acceptance within contemporary banking environments. The findings are expected to contribute to the growing body of literature on AI adoption in financial services by extending existing technology acceptance research to incorporate gender-specific perspectives. Furthermore, the study will provide practical insights for banks, technology developers, and policymakers seeking to design inclusive, trustworthy, and customer-oriented AI-powered banking services capable of meeting the expectations of diverse customer groups while supporting responsible digital transformation in the financial sector.

LITERATURE REVIEW

Author(s) & Year	Objective	Key Findings
Ikhsan et al. (2025)	To examine customers' intention to continue using AI in the Indonesian banking sector by investigating the influence of trust, perceived usefulness, and technology acceptance factors.	The study found that trust, perceived usefulness, and customer satisfaction significantly enhanced customers' intention to continue using AI-powered banking services, while concerns regarding security reduced adoption intentions.
Byambaa et al. (2025)	To identify the determinants influencing customers' adoption of AI-powered banking services in Mongolia.	The findings revealed that trust, perceived ease of use, and performance expectancy positively influenced AI adoption, whereas perceived risk negatively affected customer acceptance.
Rajalakshmi (2025)	To review the impact of AI adoption on banking performance and customer experience.	The study concluded that AI significantly improves operational efficiency, customer service quality, and fraud detection, but customer trust and digital literacy remain essential for successful adoption.
Smith (2025)	To investigate how AI-based credit assessment systems influence gender equity in financial inclusion.	The study reported that AI systems often reproduce existing gender inequalities because algorithmic models rely on gender-biased data, resulting in women receiving comparatively lower access to credit despite strong repayment records.
Alenazi (2026)	To extend the UTAUT model by examining the determinants of AI banking adoption in Saudi Arabia.	The findings indicated that trust, facilitating conditions, performance expectancy, and social influence significantly influenced customers' intention to adopt AI-powered banking services, with trust emerging as one of the strongest predictors.
Assessing the Influence of AI Adoption and Trust (2026)	To examine the influence of AI adoption and trust on customer satisfaction in digital banking.	The study found that AI adoption positively affects customer satisfaction, and trust plays a mediating role in strengthening customers' acceptance and continued usage of AI-enabled banking services.
Cevher and Önen (2026)	To investigate the impact of AI-supported digital banking applications on customer satisfaction and loyalty.	The study concluded that AI-powered banking applications significantly enhance customer satisfaction and loyalty through personalized services, improved responsiveness, and better customer experiences.
Stephany and Duszynski (2026)	To examine gender differences in the adoption of generative AI technologies and identify factors responsible for unequal adoption.	The findings revealed that women adopted AI technologies significantly less frequently than men due to greater concerns regarding privacy, ethical issues, and societal risks, highlighting the importance of gender-specific strategies to

		improve AI acceptance.
Waliullah et al. (2025)	To systematically review the influence of cybersecurity threats on digital banking adoption.	The review found that cybersecurity concerns and perceived risk remain major barriers to digital banking adoption, while AI-enabled fraud detection and stronger security measures significantly improve customer trust and acceptance.
Saha et al. (2025)	To review opportunities, challenges, and regulatory issues associated with Generative AI in financial institutions.	The study concluded that Generative AI enhances customer engagement, operational efficiency, and personalized financial services but requires strong governance, transparency, ethical AI practices, and robust data protection to increase customer trust and adoption.

RESEARCH OBJECTIVE

To examine the gender differences in customers' acceptance of AI-powered banking services by analyzing how male and female users differ in their perceptions of key technology acceptance factors.

HYPOTHESIS

H₀: There is no significant difference between male and female customers in the acceptance of AI-powered banking services.

H₁: There is a significant difference between male and female customers in the acceptance of AI-powered banking services.

RESEARCH METHODOLOGY

This study adopted a quantitative research approach using a descriptive and cross-sectional research design to examine gender differences in the acceptance of AI-powered banking services. Primary data were collected through a structured questionnaire administered to banking customers who had awareness of or experience with AI-powered banking services such as chatbots, virtual assistants, or AI-enabled mobile banking applications. A total sample of **300 respondents** of Bhiwani was selected using a convenience sampling technique, comprising **152 male and 148 female** participants to facilitate gender-based comparison. The questionnaire consisted of demographic questions and items measuring customers' acceptance of AI-powered banking services using a five-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). Data were collected through both online and offline survey methods to ensure broader respondent participation. The collected data were coded and analyzed using the **Statistical Package for the Social Sciences (SPSS) Version 29**. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were employed to summarize the respondents' demographic characteristics and overall acceptance levels. An **Independent Samples t-test** was used as the primary analytical tool to compare the mean acceptance scores of male and female respondents and determine whether statistically significant gender differences existed. Statistical significance was assessed at the **5% significance level ($p < 0.05$)**, and **Cohen's d** was calculated to evaluate the practical significance of the observed differences.

DATA ANALYSIS

4.1 Gender Differences in Acceptance of AI-Powered Banking Services

An independent samples t-test was conducted to examine whether male and female customers differ significantly in their acceptance of AI-powered banking services. The analysis compared the mean acceptance scores of male and female respondents.

Table 4.1 Descriptive Statistics of AI-Powered Banking Acceptance by Gender

Gender	N	Mean	Standard Deviation
Male	152	4.08	0.53
Female	148	3.79	0.61
Total	300	3.94	0.58

(Source- SPSS)

Table 4.1 presents the descriptive statistics for AI-powered banking service acceptance across gender. Male respondents reported a higher mean acceptance score ($M = 4.08$, $SD = 0.53$) than female respondents ($M = 3.79$, $SD = 0.61$). The results suggest that male customers exhibit relatively greater acceptance of AI-powered banking services compared with female customers. However, descriptive statistics alone do not indicate whether the observed difference is statistically significant; therefore, an independent samples t-test was performed.

Table 4.2 Independent Samples t-Test for Gender Differences in AI-Powered Banking Acceptance

Variable	Male Mean	Female Mean	Mean Difference	t-value	df	p-value
AI-powered Banking Acceptance	4.08	3.79	0.29	4.38	298	0.000** *

(Source- SPSS)

Note: * $p < 0.001$**

The independent samples t-test results presented in Table 4.2 indicate a statistically significant difference in the acceptance of AI-powered banking services between male and female respondents ($t = 4.38$, $df = 298$, $p < 0.001$). Since the p-value is less than the 0.05 level of significance, the null hypothesis of no gender difference is rejected. The findings reveal that male respondents demonstrate significantly higher acceptance of AI-powered banking services than female respondents. This difference may be attributed to variations in perceived technological confidence, trust in AI systems, and risk perception. Male customers generally appear to be more comfortable adopting innovative financial technologies, whereas female customers may exhibit greater caution regarding issues such as data privacy, cybersecurity, and algorithmic decision-making. These findings are consistent with technology acceptance literature suggesting that demographic characteristics, particularly gender, continue to influence individuals' adoption of emerging digital technologies.

Table 4.3 Effect Size (Cohen's d)

Comparison	Cohen's d	Effect Size
Male vs Female	0.51	Moderate

(Source- SPSS)

To determine the practical significance of the observed gender difference, Cohen's d was calculated. As shown in Table 4.3, the effect size ($d = 0.51$) indicates a moderate difference between male and female respondents regarding the acceptance of AI-powered banking services. This suggests that although gender significantly influences customer acceptance, it is one of several factors affecting AI adoption. Other variables such as trust, perceived usefulness, digital literacy, prior experience with AI technologies, and perceived risk may also contribute substantially to customers' behavioral intentions. Therefore, financial institutions should complement gender-sensitive strategies with broader initiatives aimed at improving transparency, customer education, and confidence in AI-enabled banking services.

Table 4.4 Hypothesis Testing Summary

Hypothesis	Statistical Test	p-value	Decision
H₀: No significant gender difference in AI-powered banking acceptance	Independent Samples t-test	<0.001	Rejected
H₁: Significant gender difference in AI-powered banking acceptance	Independent Samples t-test	<0.001	Accepted

DISCUSSION

The findings indicate that gender significantly influences customers' acceptance of AI-powered banking services. Male respondents reported significantly higher acceptance than female respondents, suggesting that gender remains an important demographic factor in the adoption of AI-enabled financial technologies. The moderate effect size further indicates that while gender has a meaningful impact, it should not be viewed as the sole determinant of AI adoption. Banks should therefore develop inclusive strategies that address the specific concerns of different customer groups. Enhancing AI transparency, strengthening cybersecurity measures, improving data privacy protections, and increasing customer awareness through educational campaigns may reduce perceived risks and improve acceptance, particularly among female customers. Such initiatives can facilitate more equitable adoption of AI-powered banking services and support the broader objectives of digital transformation and financial inclusion.

CONCLUSION

The present study examined gender differences in the acceptance of AI-powered banking services and found that gender significantly influences customers' willingness to adopt AI-enabled financial technologies. The results of the independent samples t-test indicated that male respondents demonstrated significantly higher acceptance of AI-powered banking services than female respondents, suggesting that perceptions of AI in banking vary across gender. These differences may be attributed to variations in trust, perceived risk, privacy concerns, confidence in technology use, and attitudes toward innovative financial services. While AI-powered banking offers numerous benefits, including enhanced convenience, faster service delivery, personalized financial solutions, improved fraud detection, and greater operational efficiency, its successful implementation depends largely on customers' confidence in the technology. The findings highlight the importance of developing gender-inclusive strategies that address the specific concerns of different customer groups. Financial institutions should focus on enhancing transparency in AI decision-making, strengthening cybersecurity measures, protecting customer data privacy, improving user-friendly interface design, and implementing educational initiatives that increase awareness and trust in AI-powered banking services. Such measures can help reduce customer apprehension, particularly among female users, and promote broader acceptance of AI-enabled financial services. The study contributes to the existing literature by demonstrating that gender remains an important demographic factor in the adoption of AI-powered banking technologies and provides valuable insights for banks, technology developers, and policymakers seeking to design inclusive and customer-centric AI solutions. However, the study is limited by its focus on gender as the sole demographic variable and does not account for other factors such as age, education, income, digital literacy, or prior experience with AI technologies that may also influence customer acceptance. Future research should examine these additional variables, employ larger and more diverse samples, and explore cross-cultural differences to provide a more comprehensive understanding of AI-powered banking adoption. Overall, the findings emphasize that although AI has the potential to revolutionize the banking industry, its long-term success will depend on financial institutions' ability to build trust, address

customer concerns, and develop inclusive strategies that encourage acceptance among all segments of society.

SUGGESTIONS AND IMPLICATIONS

The findings of this study have important managerial, practical, and policy implications for banks, technology developers, and regulators seeking to enhance the adoption of AI-powered banking services. Since significant gender differences were observed in customer acceptance, financial institutions should adopt gender-inclusive strategies that address the distinct needs and concerns of male and female customers. Banks should prioritize building customer trust by ensuring transparency in AI-based decision-making, clearly communicating how customer data are collected and protected, and strengthening cybersecurity and privacy measures. User-friendly interfaces, personalized onboarding, and digital literacy programs should be developed to improve customers' confidence in using AI-enabled banking services, particularly among individuals who may perceive greater technological or security-related risks. Regular awareness campaigns highlighting the benefits, reliability, and ethical use of AI can further reduce customer hesitation and increase acceptance. Banks should also establish effective customer support systems that combine AI capabilities with human assistance to enhance customer confidence and satisfaction. From a policy perspective, regulators should develop comprehensive guidelines for the ethical and responsible use of AI in banking, emphasizing transparency, accountability, fairness, and consumer data protection to strengthen public trust. The study also provides implications for researchers by highlighting the need to examine additional demographic, psychological, and technological factors influencing AI adoption and to validate these findings across different geographical and cultural contexts. Overall, adopting customer-centric and inclusive AI implementation strategies will not only improve customer acceptance but also support the sustainable digital transformation of the banking sector and promote greater financial inclusion.

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