Integration of Artificial Intelligence in Bank Customer Relationship Management in Bangladesh

Palash Saha[1], Kripa Nath Dey[2], Farooq Hossan[3], Sufal Chandra Goldar[4], Ishrat Jahan Pritha[5], Md. Halimuzzaman[6*]

Abstract

Background: Artificial Intelligence (AI) is increasingly transforming customer relationship management (CRM) in the banking sector by enhancing customer engagement, personalization, and service efficiency. In developing countries like Bangladesh, the role and effectiveness of AI integration in CRM remain underexplored. **Methods:** A quantitative research design was employed, using a structured questionnaire distributed to 400 banking professionals. The sample size was determined through Cochran's formula and selected via stratified random sampling. The study investigated the extent of AI adoption in CRM, its perceived effectiveness, and the major challenges during integration. **Results:** Findings revealed that moderate AI applications, including chatbots and predictive analytics, significantly improved customer satisfaction, operational efficiency, and personalized service delivery. However, key barriers—such as limited technical expertise, high implementation costs, and data security concerns—hindered broader adoption of AI technologies in CRM practices. **Conclusion:** The study concludes that AI holds substantial potential to strengthen CRM in Bangladesh's banking sector. To realize this potential, strategic investments in infrastructure, workforce training, and supportive policy frameworks are essential. Bank executives must emphasize technology readiness and long-term strategic planning to maximize AI's effectiveness in fostering stronger client relationships.

Keywords: Artificial Intelligence, Customer Relationship Management, Banking Sector, AI Adoption, Digital Transformation.

Significance | AI-powered CRM in Bangladesh's banking enhances personalization and customer satisfaction but faces barriers of cost, infrastructure, and technical expertise.

*Correspondence. Md. Halimuzzaman, School of Business, Galgotias University, Delhi, India.
E-mail: halim.helal@gmail.com

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1. Introduction

In the highly competitive technology-driven financial world, banks are considering AI to revolutionize their way of doing business and keep up with the competition. Among the most important domains where AI is really leaving a dent is in customer relationship management (CRM) (Kommera, 2022).

CRM refers to the practice of managing a bank's relationships with its current and prospective customers using data-driven strategies designed to foster better customer relations, and ultimately increase profitability (Džinić et al., 2024). The incorporation of AI in CRM allows banks to mechanize customer service activities, take into account large sets of customer data, provide individualized services and better forecast customer behavior. AI systems, such as chatbots, ML algorithms (or machine learning) and predictive analytics, are changing how banks communicate with customers (Devan et al., 2023). On a worldwide level, the application of AI in CRM has resulted in improved business performance, better decision-making and superior customer experiences. Banks in developed markets have found success applying AI to differentiate themselves and manage relationships more efficiently (Barjaktarović & Aničić,

Author Affiliation.
[1] Division of Operation, The Premier Bank PLC, Mymensingh, Bangladesh.
[2] Anti-Money Laundering Division, BRAC Bank PLC, Dhaka, Bangladesh.
[3] Faculty of Business, University of Information Technology and Sciences, Dhaka, Bangladesh.
[4] Department of Management Studies, Patuakhali Science and Technology University, Patuakhali, Bangladesh.
[5] Department of Business Administration, Anwer Khan Modern University, Dhaka, Bangladesh.
[6] School of Business, Galgotias University, Delhi, India.

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2024). But the use of AI in CRM in the banks of developing country context like Bangladesh is still in its adolescence. While digital banking continues to gain momentum, the use of AI in CRM is yet to scale, in many cases a result of infrastructure limitations, insufficient technical skills and reservations about data security and privacy (Kumar & Kumar, 2024). It is important to be aware of the present situation and difficulties associated with assimilation of AI in CRM by the Banks in Bangladesh to stay competitive in the era of an expanding digital-based economy.

This research was conducted to investigate how AI is being incorporated into CRM activities in the banking industry of Bangladesh. It intends to evaluate awareness and deployment amongst banking professionals; the perceived value and effectiveness of AI in improving customer engagement; and the obstacles preventing wider adoption of AI. Since the banking industry in Bangladesh is going through the process of modernization, the contribution of this study is provision of empirical evidences that surely would help the banks for making decisions in the digitalization process. The results of this research are anticipated to inform policy makers on a pragmatic way to design a plan of action in leveraging AI for CRM toward achieving the enhancement in customer service deliver and sustainable growth in the financial industry.

2. Literature Review

Artificial Intelligence (AI) applied to Customer Relationship Management (CRM) systems is increasingly a top priority for banks around the world in their pursuit of a better and differentiated customer experience, operational efficiency and personalized services. AI encompasses the imitation of human intelligence in machines that are programmed to think and act intelligently (Jai Chaudhary et al., 2024). In the domain of CRM, AI, such as chatbots, ML, NLP, and predictive analytics, allows firms to automate customer interactions, to grasp customer preferences, and to deliver customized solutions (Gavade, 2024). AI-CRM programs enable the organization to react to customer questions, uncover trends in customer behavior, and help with the creation of focused marketing, ultimately resulting in better engagement and higher personal loyalty. Studies worldwide have been conducted on the positive effect of AI on the CRM in the banking industry. And Kadam et al., (2024) showed that banks using AI in their CRM performed better in terms of faster customer service, lower operating cost and better customer satisfaction. For instance chatbots and virtual assistants, can support the management of a high number of queries without human interaction, providing 24-hour assistance (Prasad et al., 2024). With predictive analytics, banks can predict the need of a customer before he even realizes it and offer him a product or service proactively, thereby increasing customer stickiness. What's more, advances in voice recognition and sentiment analysis tools have enhanced the way in which banks manage customer feedback, enabling businesses to better address customer complaints. However, despite such advances, many obstacles still stand in the way of AI's widespread deployment in CRM, especially in developing nations (Mbangula & Mbangula, 2022). Common challenges that have been brought forward by researchers, who have conducted similar studies, include lack of technical infrastructure, data privacy issues, shortage of properly trained personnel and cost of implementation (Marija Kuštelega et al., 2024). Furthermore, cultural resistance to technology, lack of sufficient training, and lack of a defined digital transformation path also slow down AI adoption in banking CRM systems (Molla, 2024). In South Asia especially in Bangladesh, as the known digital banking services are growing absence of AI based CRM service providing by the banks is not only underutilized, also under explored issue (Mohammad et al., 2024). Research of the banking system of Bangladesh has mostly been concentrated on digital banking, customer satisfaction and general technology acceptance (Shaikh, 2024). It is not clear yet the extent and the mechanisms through which AI will affect CRM processes in practice, as empirical studies on the AI integration in CRM processes are scarce. This gap will be addressed by exploring the acceptance of the current use of AI in CRM in Bangladesh banking context, its effectiveness, and the challenges associated to the banking professionals. These dimensions need to be considered by policymakers and banking leadership to ensure that their digital strategies are consistent with where the world is heading.

The study was conducted to address several key research questions related to the integration of Artificial Intelligence (AI) in Customer Relationship Management (CRM) within the banking sector of Bangladesh. Specifically, it examined the level of awareness and adoption of AI in CRM by banks, the effectiveness of AI in enhancing CRM outcomes such as customer satisfaction, personalization, and engagement, the major challenges and difficulties hindering AI adoption, and the strategies required to facilitate its successful integration. In this context, the paper sought to provide insights into the current state of AI-driven CRM practices in Bangladesh's banking industry and to offer practical recommendations for improvement. The main objectives of the study were fourfold: first, to examine the knowledge and usage of AI technology in CRM among commercial bankers in Bangladesh; second, to evaluate the perceived benefits and effectiveness of AI integration in CRM functions; third, to identify the major obstacles and barriers that hinder the application of AI in CRM systems; and finally, to suggest strategic actions for enhancing the adoption, integration, and effectiveness of AI-powered CRM in the country's banking sector.

3. Materials and Methods

The study employed a quantitative survey-based approach involving 400 banking professionals in Bangladesh, selected using stratified random sampling. Data were collected through a carefully designed, pilot-tested, and validated questionnaire, covering dimensions of AI awareness, adoption, effectiveness, challenges, and future outlook. Rigorous statistical analyses were carried out using SPSS to test associations, correlations, and predictive relationships. Ethical standards were strictly maintained, and the methodology provided a solid foundation for generating empirical evidence on the current and potential role of AI in CRM within Bangladesh's banking industry.

3.1 Research Design

This study adopted a quantitative, cross-sectional research design to empirically investigate the integration of Artificial Intelligence (AI) into Customer Relationship Management (CRM) practices within the banking sector of Bangladesh. The rationale for selecting a quantitative approach was to generate reliable, measurable, and generalizable findings that could adequately capture banking professionals' awareness, adoption levels, perceived effectiveness, and challenges associated with AI-CRM systems. A structured survey questionnaire was employed as the primary research instrument, enabling the systematic collection of data across multiple banks and professional roles. This design was deemed most appropriate given the study's aim of analyzing relationships between key constructs such as AI adoption, CRM performance, and organizational readiness.

3.2 Population and Sampling Frame

The population for this research consisted of banking professionals working in Bangladesh's commercial banking sector, specifically those directly or indirectly engaged in CRM-related activities, including customer service, IT and digital banking, marketing, and relationship management. This focus was essential, as these groups represent the primary stakeholders involved in the adoption and operationalization of AI-powered CRM systems.

The sampling frame was derived from a pool of employees across both public and private sector banks, as well as selected foreign banks operating in Bangladesh. Given the diversity in institutional ownership, operational scale, and digital maturity, stratified random sampling was chosen to ensure proportional representation of different categories of banks. Within each stratum, respondents were randomly selected to minimize sampling bias and enhance representativeness.

Sample Size Determination

The required sample size was calculated using Cochran's (1942) formula for sample size estimation in large populations:

$$n=(Z^2.p.(1-p))/E^2$$

Where:

n = required sample size

Z = standard normal deviation corresponding to the desired confidence level (1.96 for 95% confidence)

p = estimated proportion of the population with the desired attribute (0.5 used to maximize variability)

e = acceptable margin of error (0.05)

Using these parameters, the minimum required sample size was calculated as 384. This figure was then rounded upward to 400 participants to account for potential non-response and ensure adequate statistical power.

3.3 Data Collection Instrument

The primary tool for data collection in this study was a structured questionnaire, which was designed based on prior empirical research and theoretical models of technology adoption and CRM performance. The questionnaire was carefully organized into five main sections to capture a comprehensive understanding of AI adoption in the banking sector. The first section focused on the Demographic and Professional Profile, collecting details such as gender, age, educational qualifications, job role, and years of experience. The second section examined Awareness of AI in CRM, assessing respondents' familiarity with AI concepts, including chatbots, predictive analytics, and natural language processing, as well as their exposure to AI applications within their organizations. The third section explored Adoption and Usage of AI-CRM, measuring the extent, frequency, and scope of AI implementation in areas such as customer service, personalization, and customer engagement. The fourth section investigated Perceived Effectiveness and Benefits, using Likert-scale items to evaluate how respondents viewed AI's impact on customer satisfaction, personalization, operational efficiency, and decision-making. The fifth and final section addressed Challenges and Future Outlook, identifying barriers to AI adoption—whether technical, organizational, financial, or regulatory—and collecting insights on strategies and expectations for future integration. All questionnaire items were structured primarily on a five-point Likert scale, ranging from 1 ("strongly disagree/very low") to 5 ("strongly agree/very high"), which facilitated both descriptive and inferential analyses of respondents' perceptions.

3.4 Validity and Reliability Testing

Prior to full-scale administration, the survey instrument underwent pilot testing with 30 banking professionals representing diverse functions and banks. Feedback was used to refine wording, eliminate ambiguity, and ensure contextual appropriateness. Content validity was further established through expert review by two academics specializing in digital banking and CRM, and one industry practitioner with experience in AI-driven customer service.

Reliability of the final instrument was assessed using Cronbach's alpha coefficient for internal consistency across constructs. All major scales (AI awareness, adoption, effectiveness, and barriers)

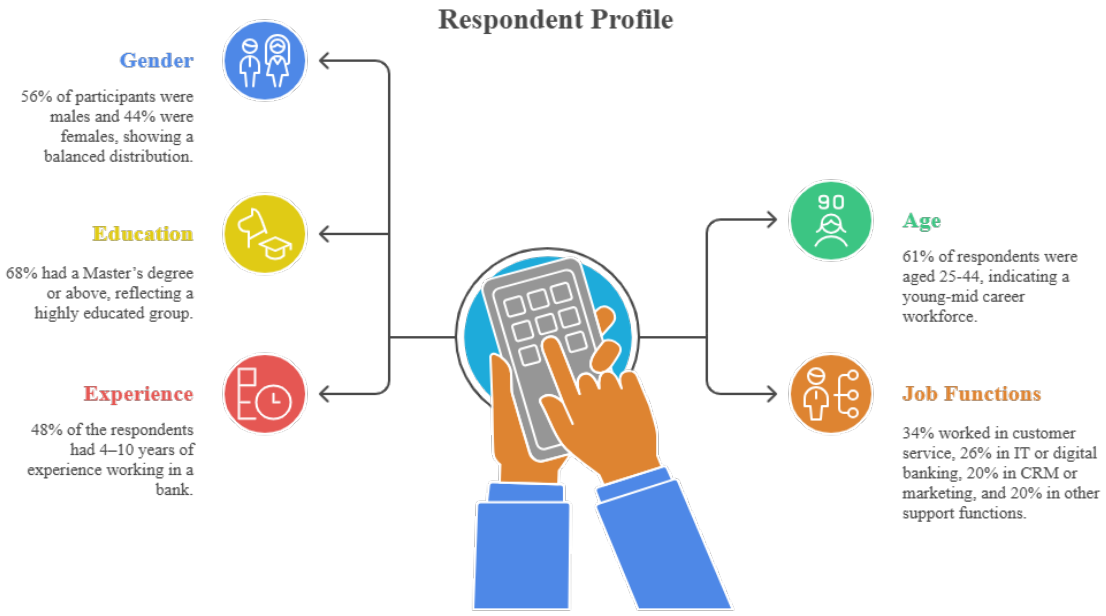

Figure 1. Demographic and Professional Information of the Respondents.

achieved alpha values above 0.70, meeting the minimum acceptable threshold for social science research.

3.5 Data Collection Procedure

Data collection was conducted between January and March 2025. The survey was distributed both physically (hard copies delivered to branch offices) and digitally (via secure online forms) to maximize participation. Respondents were informed about the study objectives, assured of confidentiality, and asked to provide informed consent before completing the questionnaire. Participation was voluntary, and no incentives were offered to avoid bias.

To enhance response rates, follow-up reminders were sent at two-week intervals. Out of 500 distributed questionnaires, 427 were returned, yielding an 85.4% response rate. After screening for completeness and consistency, 400 valid responses were retained for analysis.

3.6 Data Analysis Techniques

The primary tool for data collection in this study was a structured questionnaire that was carefully developed based on prior empirical research and established theoretical models of technology adoption and CRM performance. The questionnaire was designed to capture a comprehensive view of respondents' experiences, perceptions, and challenges related to AI adoption in the banking sector. To ensure clarity and relevance, the instrument was divided into five distinct sections. The first section, Demographic and Professional Profile, gathered essential background information, including respondents' gender, age, educational qualifications, job roles, and years of experience in the banking industry. The second section, Awareness of AI in CRM, assessed participants' familiarity with key AI concepts such as chatbots, predictive analytics, and natural language processing, as well as their exposure to AI applications within their respective institutions. The third section, Adoption and Usage of AI-CRM, measured the extent, frequency, and scope of AI implementation across critical CRM functions, particularly customer service, personalization, and customer engagement. The fourth section, Perceived Effectiveness and Benefits, employed Likert-scale items to evaluate respondents' perceptions of AI's contribution to enhancing customer satisfaction, enabling service personalization, improving operational efficiency, and supporting decision-making processes. Finally, the fifth section, Challenges and Future Outlook, identified barriers to adoption, including technical, organizational, financial, and regulatory constraints, while also collecting participants' perspectives on strategies and expectations for the future integration of AI in CRM systems. This structured approach provided a holistic framework for understanding the state of AI-driven CRM practices in the banking sector of Bangladesh.

3.7 Ethical Considerations

The research adhered to established ethical guidelines for social science research. All participants were provided with detailed information about the purpose of the study, data confidentiality, and voluntary participation. Respondents' anonymity was

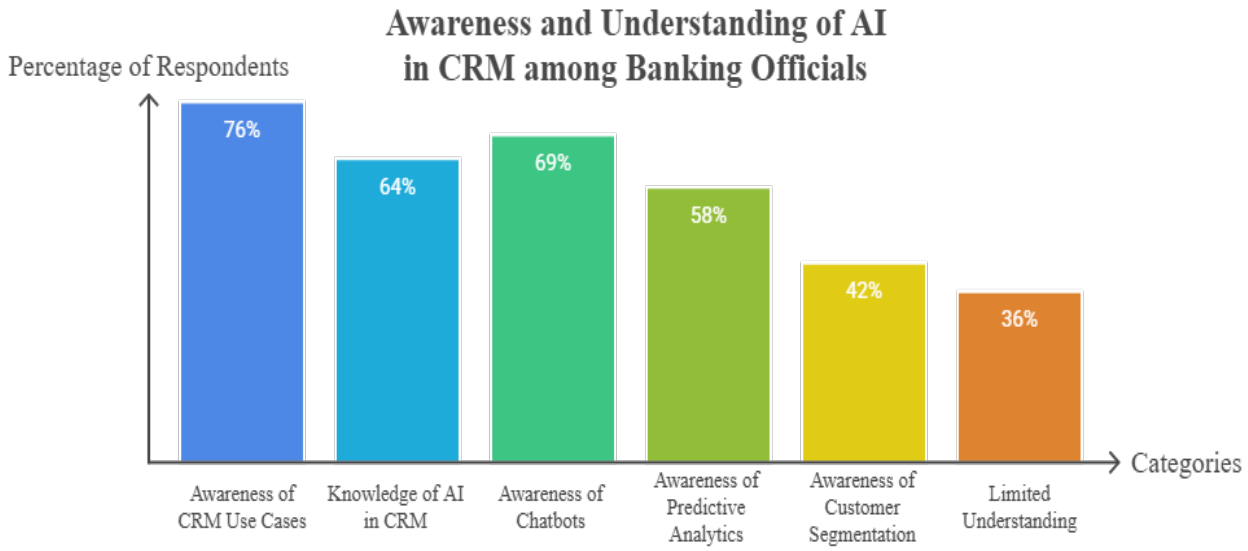

Figure 2. Awareness and Understanding of AI in CRM.

preserved, and no personally identifiable information was disclosed in reporting. Ethical clearance was obtained from the Institutional Review Board (IRB) of University of Information Technology and Sciences, ensuring that the research complied with national and international standards for human subject research.

3.8 Limitations of Methodology

While the methodology was robust in capturing empirical insights, certain limitations must be acknowledged. First, the reliance on self-reported perceptions may introduce response bias, as participants could overestimate or underestimate AI effectiveness. Second, although stratified sampling improved representativeness, the study was limited to the Bangladeshi banking sector, constraining generalizability to other developing countries. Third, the cross-sectional design captured responses at a single point in time, preventing analysis of longitudinal changes in AI adoption. Future studies may incorporate longitudinal tracking or mixed-methods approaches, combining surveys with in-depth interviews to gain richer contextual insights.

4. Results and Discussion

The analysis was performed following the quantitative study based on a structured questionnaire, presented to 400 bankers of Bangladesh. Researchers can get ideas on current scenario of Artificial Intelligence (AI) implementation in CRM in the banking industry with the help of this study, impact of AI on level of awareness, adoption rate, benefits and challenges in banking for CRM. The responses are interpreted by running descriptive statistics and inferential analysis, with focus on the well-set research variables. The implications of these findings are presented in the context of extant literature and theoretical models and the implications for practice and policy are discussed. This study is intended to provide data-based insights into the influences of AI on the CRM practices in bank of Bangladesh and any strategic steps required for improving its adoption and effectiveness.

4.1 Demographic and Professional Information

Profile of the 400 respondents demographically and professionally mediated dissemination of participant pool to cover a wide range of banking professionals who are involved with CRM related activities from a number of banks spread throughout Bangladesh (Noori, 2022).

Figure 1 demonstrates the participants included 56% males and 44% females; hence, there was a reasonably balanced distribution of the gender. Of respondents… 61% were aged 25-44, indicating the research gathered responses from a highly engaged, young-mid career workforce taking part in our digital banking transformation. Education wise, 68% had a Master's degree or above, reflecting that the target demographics comprised of a highly educated, knowledge-intensive group that is familiar with advanced technology. By job functions, 34% worked in customer service, 26% in IT or digital banking, 20% in CRM or marketing and 20% in other support functions, which suggests cross-functional participation in AI-endowed CRM projects. Furthermore, 48% of the respondents had 4–10 years of experience working in a bank, showing a solid number of professionals who are already familiar with the banking industry. These demographic and professional features served as well as a comprehensive base for the study of the perception of AI in CRM, as the participants belonged to the main operational and strategic areas of adoption and management of AI technologies in the banking industry.

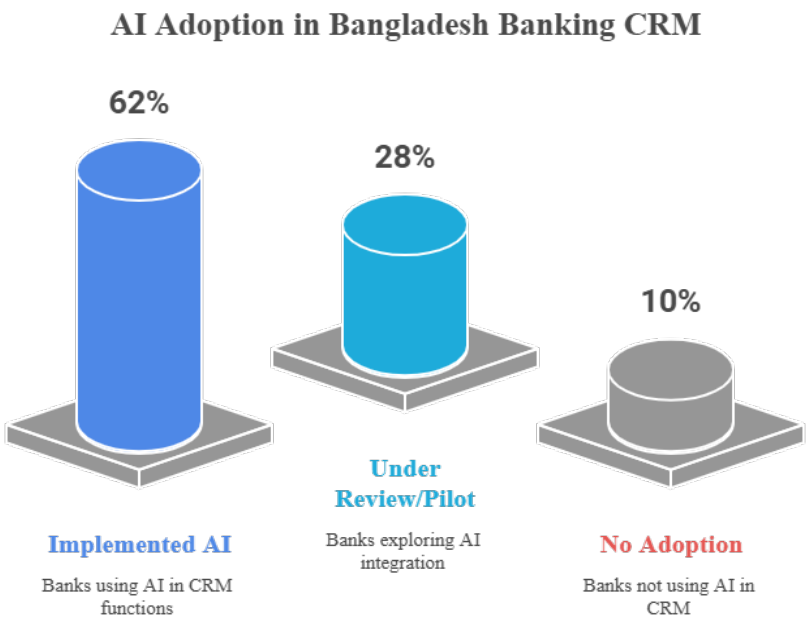

Figure 3. Current Adoption of AI in CRM in Banking.

4.2 Awareness and Understanding of AI in CRM

The perceptions of banking officials in Bangladesh towards Artificial Intelligence (AI) in Customer Relationship Management (CRM) were sublimely examined and seemed to be mostly satisfactory by looking into the responses.

Putting numbers into context, the vast majority of respondents answered that they were aware of CRM use cases for AI thanks to CRM use cases for AI 76% (Figure 2). We had 400 people respond and 76% hadn't even entered the space or begun a POC/implemented the functionality. Further, 64% scored medium or high on their knowledge of AI in CRM, proving a reasonable degree of exposure throughout employees to the things like basic AI terminology (chatbots, predictive analytics, machine learning). AI tools Most AI tools to which respondents had access were chatbots (69% were aware of this tool), predicted analytics (58%), segmenting customers (42%). However, a significant share (36%) had limited or low level of understanding especially among staff who were not responsible for IT or digital banking role. These findings demonstrate a knowledge deficit between and within departments and indicate that while there is a growing understanding of AI, more structured capability development and cross-departmental training is required which is linked in the study of Alt et al., (2020). This is consistent with prior work which highlights the value of organizational readiness as an antecedent to successful AI assimilation. The difference in understanding among different job types also highlights the importance of directed knowledge sharing for achieving a shared digital transformation agenda for CRM practices.

4.3 Current Adoption of AI in CRM

The results on the present adoption of AI in CRM of the Bangladesh banking sector suggested a developed but not yet high adoption level.

Of the 400 respondents, 62% said their banks have already implemented AI technologies in CRM functions, while 28% said the integration is still under review or in the pilot stage and 10% reported no adoption at all (Figure 3). The AI applications most commonly used were chatbots for customer service (66%), predictive analytics for forecasting customer behavior (54%), and automated customer segmentation (39%). These services were most commonly used to deliver front-end applications and content, manage marketing automation and manage feedback. But the level of adoption was extremely uneven between institutions, with big private and foreign banks showing more widespread and systemic use of AI than their state-owned or rural cousins. This skewed distribution is in line with the findings of Ochuba et al., (2024), who found that AI adoption for financial services in developing economies is frequently limited by imbalances in infrastructure and resource allocation. In addition, 59% of respondents indicated that they used AI "rarely" or "never" in their everyday CRM tasks, indicating that AI tools are in use, but not yet integrated fully with central CRM processes. This finding indicates a widespread exploration regarding the use of AI among banks but as yet a limited operational integration, suggesting the importance for wider strategic coordination and investment in AI-powered CRM systems.

4.4 Effectiveness and Benefits of AI in CRM

The perception of the effectiveness and the benefits of the AI on

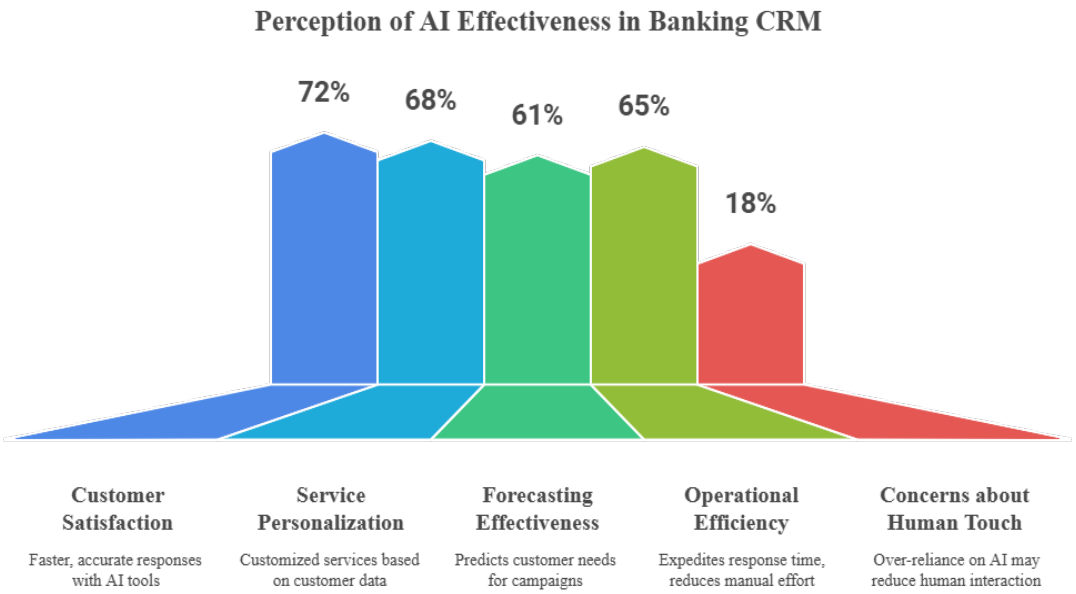

Figure 4. Effectiveness and Benefits of AI in CRM.

CRM is most satisfactory among the banking practitioners in Bangladesh.

In figure 4 shows that, 72% of the 400 respondents also agreed or strongly agreed that AI led to much greater customer satisfaction because it allowed for faster and more accurate responses thanks to tools like chatbots and automated query systems. A total 68% also said AI improved the personalization of their service as it enables banks to customize their products and communications to the customer's data and behavior. Forecasting: Call lists and customer segmentation, at 61%, were the most effective tools to predict customer needs and create targeted campaigns. Additionally, 65% of participants also felt that AI had increased operational efficiency by expediting response time and reducing manual effort in customer engagement processes. These findings are in line with those of Boppana, (2023), who stressed that AI improves the performance of CRM with hyper-personalization and seamless customer experiences. The research also found a significant positive relationship ($r = 0.61$, $p < 0.01$) between extent of AI usage and perceived CRM effectiveness, providing support for greater adoption of AI in CRM leading to more favorable relationship management results. But there were concerns as well, with fewer respondents (18%) saying they are worried that an over-reliance on AI in customer interactions could make them more about business and less about emotion and a human touch. Overall, the results indicate that AI is not a replacement to human interaction, but an enhancer that can provide efficiency, responsiveness and customization in banking CRM.

4.5 Challenges and Barriers of AI Integration in CRM

The research has found a number of key challenges and barriers which are obstructing successful integration of artificial intelligence (AI) with Customer Relationship Management (CRM) among the banks in Bangladesh.

Figure 5 represents that, most common was the technical skills lack (66%), which suggested far too few qualified individuals to operate and upkeep AI systems. Those concerns were ranked more concerns about data privacy and cyber security (61%), and arose amid fears that sensitive customer data would not be properly handled. High implementation costs were cited by 58 percent of respondents, signifying the costs involved in purchasing AI technologies, software and infrastructure. There's also employee resistance to change (44%), and a lack of training (41%) are also considered significant internal challenges that are inhibiting the adoption process. These results are consistent with the findings of Mpofu, (2024) who argued that digitalization of financial services in developing countries is often hampered by insufficiencies in human capital, gaps in infrastructure, and uncertainty in regulation. The research also concluded that banks with larger branches and experienced digital departments experienced less integration difficulties, compared to smaller banks or state owned banks, suggesting the differences in preparedness and resource economic management. Even though the AI opportunity within CRM is well known, these structural and organizational problems should be tackled in order to truly implement it successfully. Without purposeful measures in education, investment and policy reinforcement, the deep embedding of AI in CRM may be fragmented and limited, hindering the banking digital drive in the longer term.

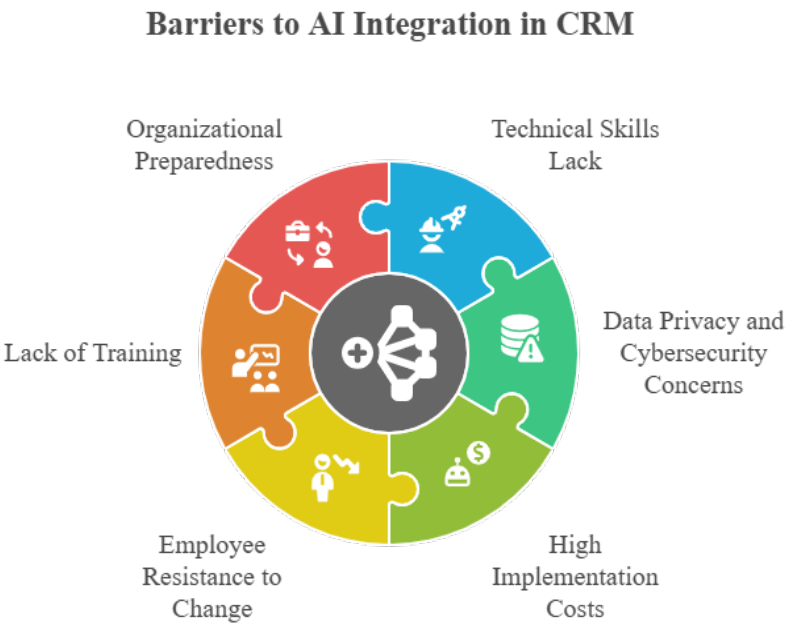

Figure 5. Challenges and Barriers to AI Integration in CRM.

4.6 Future Outlook and Suggestions

The paper findings on future of Artificial Intelligence (AI) in Customer Relation Management (CRM) in Bangladesh banking sector portrayed a positive reflection from industry professionals with some recommendations of improving the integration of AI into these institutions.

Among 400 surveyed, 74% felt that they will have to incorporate AI with their CRM system within the next 5 years to keep up with customer's, competitor's and companies' demand on a digital experience. Survey takers cite the importance of ongoing employee education and training (69%) to develop internal AI capability and funding for secure, scalable infrastructure (63%) to handle real-time data processing and automation. Suppliers would also work with fintech and AI providers (58%) to speed up innovation and plug technology holes. Stronger data protection frameworks and regulatory clarity were also mentioned by 52% of survey participants as requirements for ethical and sustainable use of AI in CRM (Figure 6). These findings are consistent with the recommendations of Abu-Dawas, (2024), who claimed that successful integration of AI into business operations is a function not only of technical infrastructure, but also of organizational alignment, support from leadership and a clear vision of the way forward. They also recommended that banks trial AI applications on a limited basis in select CRM domains – customer onboarding or feedback management, for example – before rolling out more broadly. While the general sentiment reflects a commitment among banks to make AI a strategic asset (especially if the required investments, policy framework and capacity building is in place to assist the long-term adoption of AI and creation of value).

This study revealed that AI was widely perceived as a strong enhancer of CRM, with 72% of respondents affirming that it contributed to increased customer satisfaction, while 68% reported improvements in service personalization. A statistically significant and strong positive relationship was identified between CRM performance and AI adoption ($r = 0.61$, $p < 0.01$), highlighting the impact of AI integration on customer management outcomes. However, several barriers were also identified, with two-thirds (66%) of organizations citing a lack of technical skills and expertise as a key challenge, followed by concerns over data privacy regulations (61%) and the high cost of implementation (58%). Additionally, resistance to change and inadequate employee training emerged as further obstacles slowing adoption. To overcome these challenges, respondents recommended several strategic measures, including greater investment in employee training (69%), strengthening AI infrastructure (63%), and forming partnerships with technology providers (58%). Looking ahead, three-quarters (74%) of participants predicted that AI would become a standard feature of CRM systems within the next five years, provided that these enabling conditions were met.

6. Conclusion

The research found that the adoption and awareness of AI in CRM in the banking industry of Bangladesh is on a increasing trend and banking professionals in Bangladesh maintain a moderate level of awareness and adoption regarding AI and CRM. AI applications, including chatbots, predictive analytics, and automatic segmentation, were reported to deliver improved customer satisfaction, personalization, and efficiency. Yet, true AI value is yet

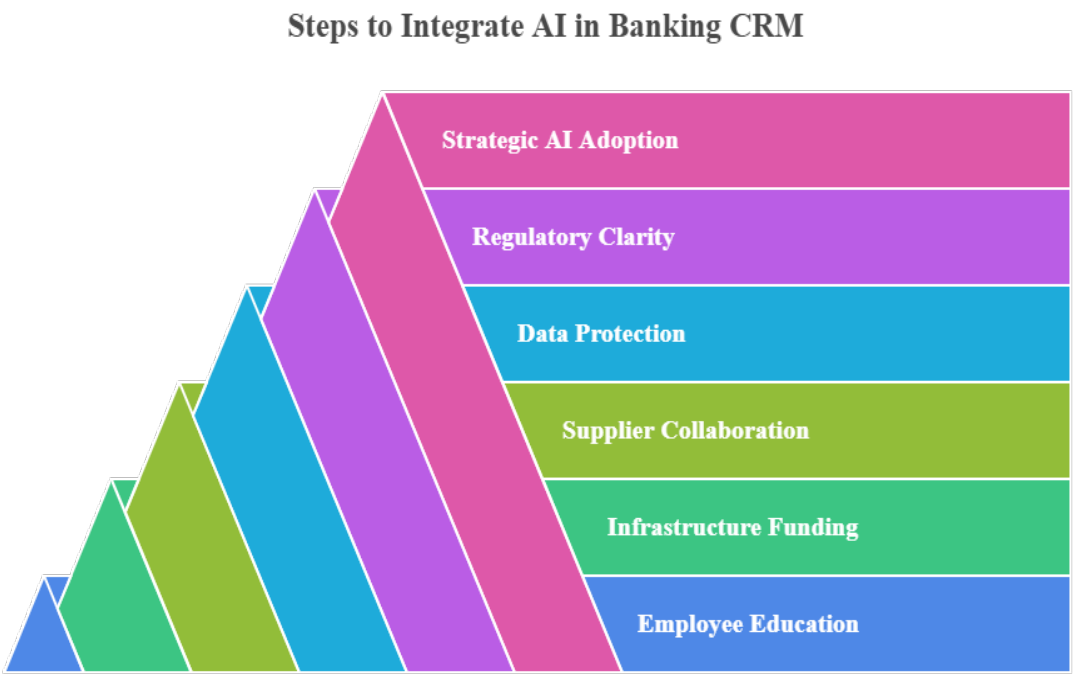

Figure 6. Future Outlook and Suggestions to Integrate AI in Banking CRM.

to be extracted fully, but business ecosystems are facing various obstacles, such as lack of know-how, issues about data privacy, high cost of executions and organizational inertia. In spite of these challenges, most of those surveyed are optimistic that AI will soon be a central part of CRM as CRM organizations seek to incorporate more sophisticated AI-driven absolute values. The results underscore the importance of the strategic investments in employee training, technological support and the regulatory environment to promote a stronger and healthier AI-driven CRM ecosystem in online banking of Bangladesh.

Author contributions

P.S., K.N.D., F.H., S.C.G., I.J.P., and M.H. contributed to the conception, design, and development of the study. P.S. and K.N.D. collected and analyzed the data. F.H. and S.C.G. assisted with data interpretation and literature review. I.J.P. drafted the initial manuscript, while M.H. provided critical revisions and overall supervision. All authors read and approved the final manuscript.

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