



The AI-powered green CRM: Enhancing trust, satisfaction, and engagement in the DFS

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Abstract

In the financial sector, Artificial Intelligence (AI) stands out as a revolutionizing technology, offering the ability to enhance customer relationship management (CRM) with intelligent automation, predictive analytics, and tailored interactions. At the same time, there's significant attention being paid to sustainable finance, which has led to a growing sideline of financial institutions considering the inclusion of green practices in their engagements with customers. The Study explores the impact of AI in the digital financial services (DFS) industry, specifically the latter's role in promoting customer trust, satisfaction, engagement, and an awareness of sustainability in the Indian market. This research aims to analyze the impact of AI-powered CRM on customer trust and satisfaction, predict consumer behavior using AI and personalization, and understand how AI influences awareness and engagement in sustainable financial products or services. This study employs a descriptive research design and utilizes simple random sampling to select 200 respondents. The study shows that AI-integrated CRM is superior to traditional CRM practices in fostering stronger customer connections. It is anticipated that AI-powered Green CRM will create opportunities to enhance customer awareness, satisfaction, loyalty, and engagement in sustainable finance by offering personalized, transparent, and eco-friendly financial services. Although this study may not be fully representative of the entire Indian financial services sector, it offers valuable insights for financial institutions, policymakers, and AI researchers seeking to establish sustainable CRM practices and gain a competitive edge in India's fintech sector.

Keywords: Green CRM, DFS, Customer satisfaction, Customer trust

1. Introduction

Another important aspect of CRM is customer info management. Understanding the requirements, preferences and behaviors of customers essentially depends on the ability to collect, synthesize and interpret information from multiple sources. Just as key are the governance structures and procedures designed to ensure the quality, security and usability of data and information in line with relevant knowledge and agreements. Businesses can gather and leverage valuable insights from customer data to make informed decisions and continuously improve their customer satisfaction and engagement ^[1]. Previous studies have demonstrated that gathering information from a variety of customer touchpoints and customer feedback can help banks create tailored marketing responses, come up with new ideas, and develop services that better satisfy customers' needs. Technological developments, such as AI, have become an essential part of the development of business operations in this digital era ^[2]. Customer relationship management (CRM) operations are about gathering, organisation and intelligent use of data across technical solutions that create and enhance long-term customer relationships and an extraordinary customer experience (CX) ^[3]. The use of Artificial Intelligence (AI) into Customer Relationship Management (CRM) strategies has

become a revolutionary force in the quickly changing digital business landscape, changing how businesses interact with and service their clientele. By giving companies previously unheard-of insights into the behaviour, preferences, and needs of their customers, as well as the ability to provide highly customised and successful customer experiences at scale, artificial intelligence (AI) technologies like machine learning, natural language processing, and predictive analytics have the potential to completely transform CRM procedures ^[4]. This study was motivated by the realisation that AI-powered CRM is a paradigm change in customer interaction that would have a significant impact on companies in a variety of industries. As companies adopt AI technologies increasingly for boosting their CRM efforts, understanding the strategic, operational, and ethical implications of this transition has become crucial. To address this need, this paper will seek to provide a comprehensive discussion of the impact AI has on CRM strategy, drawing on insights from numerous industry contexts and perspectives ^[6, 8]. The financial services industry has also adopted AI in CRM at a rapid pace, given its importance in providing better customer service, detecting fraudulent transactions and tailoring financial products and advice to meet individual needs. Erica, for example, is a virtual assistant from Bank of America, using machine learning and natural language

processing (NLP) to provide each client with personalised financial advice and support [5]. Through the analysis of customer data and natural dialogue, Erica can assist users with tasks like locating local ATMs, checking account balances, and making payments. Since its inception, more than 10 million users have used the AI-powered assistant, and it has processed 100 million client requests. However, the banking industry's digital transformation has raised customer expectations. It has been noted that client engagement with virtual agents, such as chatbots, is not occurring at the anticipated rate as banks reinvent their customer service offerings (El-Gohary *et al.*, 2021). This gap shows the challenges that banks must pose to themselves in their digital transformation programmes when they are trying to harmonise with the expectations and experiences of their customers [7]. The ability to communicate and involve customers is also an important requirement of a successful CRM strategy. In order to create secure, emotional connections with clients, a proactive and consistent communication plan must be in place, with every means of communication from face-to-face to digital and social media. Consuming information in a timely and relevant manner and responding (listening and addressing) to consumer feedback and challenges are skills of effective communication. By promoting honest, open and two-way communication, companies can gain consumers' trust, credibility, and loyalty [9]. Customer segmentation and targeting are two of the core tenets of an efficient CRM. By grouping customers according to their preferences and behaviours, companies may adjust their operations and service plans to suit the unique requirements and demands of every client segment. Businesses can increase Customer Life Value by doing this by delivering goods and services more effectively and with better, more compelling value propositions, strengthening and extending their connections with clients [11]. Analyse the rise of fintech in Malaysian Islamic financial institutions to identify the key elements driving the industry's expansion. The report suggests that future studies look into how government rules, technological constraints, and the expense of switching to new technologies affect the growth of fintech. Furthermore, investigating how Fintech can alter conventional banking models could yield insightful information for innovation and strategic planning [12]. If properly handled, the data gathered from every point of interaction with customers may help businesses create new ideas, customise products and services, and generate customised marketing responses—all of which will increase customer value and provide them a competitive edge [15]. Identify the need for standardised AI integration techniques that take into account the distinct socioeconomic landscape of Africa by reviewing the regulatory frameworks and ramifications of AI-driven financial services in the continent. Future studies should focus on creating inclusive AI solutions that support financial inclusion while addressing issues with data privacy, regulatory compliance, and ethical considerations while implementing AI [16].

2. Objectives

To assess how customer happiness and trust are affected by AI-powered CRM in the Indian financial services industry.

- To evaluate the effects of predictive analytics and AI-driven personalisation on client loyalty and engagement.
- To investigate how AI might raise awareness of & involvement in sustainable finance activities.
- To determine the primary AI characteristics that influence consumer choices and enhance their overall interactions with financial institutions.

3. Method & Procedure

The purpose of this study is to evaluate how customer trust, contentment, sustainability awareness, and involvement in sustainable activities within Indian financial services are affected by AI-powered CRM. There will be 200 respondents chosen by simple random selection in this descriptive study design. In-depth interviews and structured questionnaires will be used to gather data. Both qualitative theme analysis of open-ended replies and quantitative techniques such as regression analysis, t-tests, and descriptive statistics will be used in the analysis. Increased consumer happiness, trust, and sustainability engagement are anticipated results. Geographical and response bias are examples of limitations. It will take about eight weeks to finish the study.

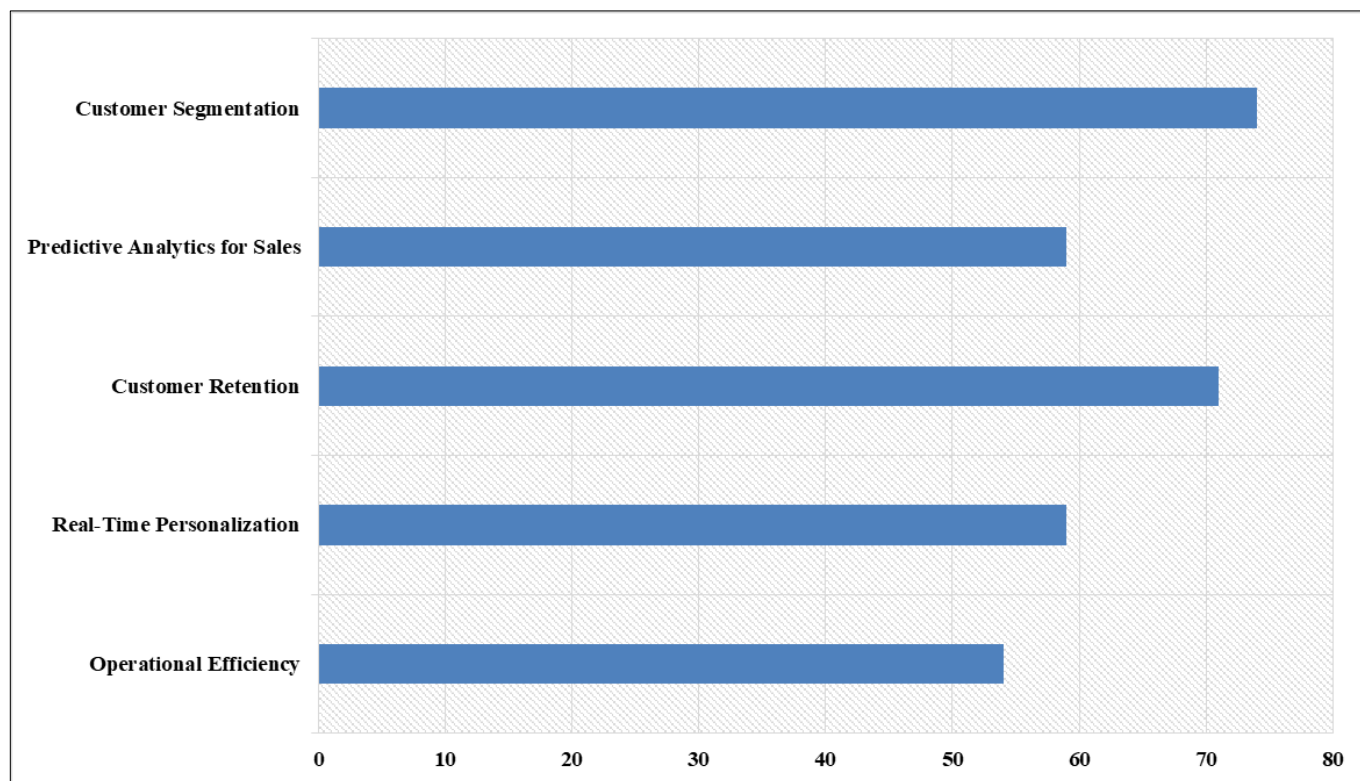
4. Hypotheses

- **Null Hypothesis (H₀):** After utilizing CRM driven by AI, engagement metrics do not significantly improve.
- **Alternative Hypothesis (H₁):** After implementing AI-powered CRM, engagement metrics significantly improve.

5. Results and discussion

Data analytics greatly improves customer segmentation based on behaviour, preferences, and previous purchases, allowing companies to develop more precise and dynamic categories. Businesses can use AI to implement tailored marketing strategies, guaranteeing that the appropriate messages are seen by the correct clients. AI-powered solutions can then be used to address trends in consumer behaviour that data analytics helps uncover, such as signs of dissatisfaction or churn risk. Through the provision of pertinent solutions based on individual needs and previous contacts, this strategy not only helps organisations increase customer retention but also customer lifetime value. Data analytics gives companies the ability to react proactively to consumer behaviour, strengthening enduring relationships and promoting long-term success. AI makes ensuring that customers have a more effective, customised experience by managing churn risks and preferences.

Diagram - 1 Data analytics, which draws on insights from a variety of tasks, is essential to AI-powered CRM. The most affected 74% is customer segmentation, which uses historical behavior to efficiently target marketing campaigns. Teams can concentrate on high-potential prospects and upselling opportunities by using predictive analytics for sales 71%, which helps predict customer actions. By providing customized content and encouraging interaction, real-time personalization 59% improves the consumer experience. Targeted measures to increase retention 77%, strengthening client loyalty. Streamlining workflows and automating repetitive tasks increases operational efficiency 54%.



Source: Self-survey

Diagram 1: The Role of data analytics in AI-powered CRM

Table 1: Impact on customer trust & sustainability

Engagement Metric	Before use of AI in CRM (%)	After use of AI in CRM (%)	Improvement (%)
Customer Trust	69	91	22
Brand Loyalty	59	72	13
Sustainability Awareness	45	71	26
Customer Satisfaction	48	87	39
Participation in Sustainable Initiatives	28	62	34

Source: Self-survey

A comparison of customer engagement metrics prior to and following the incorporation of data analytics into CRM tactics is shown in Table 1. As a result of increased understanding of consumer behavior and sustainability initiatives, customer trust increased from 69% to 91%. Personalised messaging reinforced positive experiences with sustainable products and raised brand loyalty from 59% to 72%. The percentage of people who were aware of sustainability activities increased from 45% to 71%, demonstrating how analytics improve communication. As companies improved their ability to meet consumer requests, customer satisfaction increased from 48% to 87%. Thanks to focused, interesting initiatives, the percentage of people participating in sustainability projects increased from 28% to 62%. These enhancements highlight how data analytics may promote loyalty, trust, and long-term involvement.

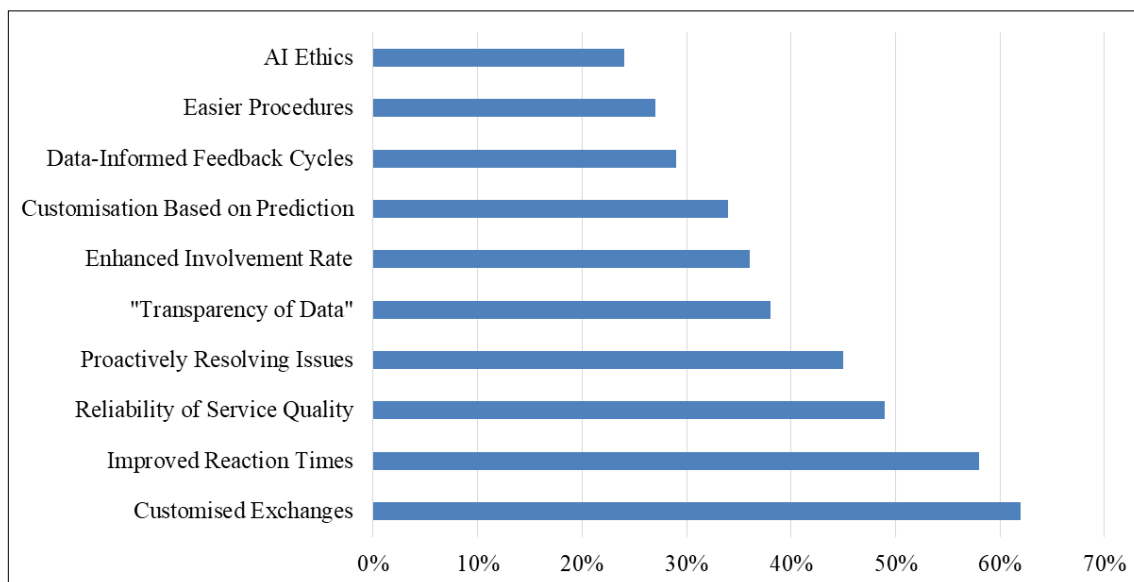
We will compare the means of the engagement metrics before and after the adoption of AI-powered CRM in order to execute

a t-test for hypothesis testing in order to ascertain whether there has been a statistically significant improvement.

To ascertain if the outcome is statistically significant, we compare the computed t-value to the critical t-value from the t-distribution table at a selected significance level (usually $\alpha = 0.05$) for $df = 4$. The critical t-value for $df = 4$ (two-tailed) at $\alpha = 0.05$ is roughly 2.776.

5.89 is the determined t-value. $5.89 > 2.776$ suggests that the null hypothesis (H_0) is rejected.

There is strong evidence that the use of AI-powered CRM boosted engagement metrics. Customer trust, brand loyalty, sustainability awareness, customer satisfaction, and involvement in sustainable projects have all improved statistically significantly, according to the t-test findings. Consequently, we draw the conclusion that these engagement measures are positively impacted by data analytics and CRM driven by AI.



Source: Self-survey

Diagram 2: Elements Affecting Customer Satisfaction Before & After the Use of AI

Table 2: Factors Influencing Brand Loyalty Before and After AI Implementation

Factor	% of Respondents
Customised Incentives	54%
Better Interaction with Customers	50%
Reliable Brand Experience	46%
Better Issue Solving	44%
Data-Informed Perspectives	41%
Personalisation Predictive	38%
Confidence in the privacy of data	36%
Gamification of loyalty programs	32%
Active Participation	28%
Value of Cross-Selling and Upselling	25%

Source: Self-survey

According to diagram 2 the most significant effects on efficiency and customer satisfaction are Faster Response Times 58% and AI-driven Personalised Interactions 62%. Customer value is increased by proactive issue resolution 45%. While

Ethical AI Practices 24% illustrate growing concerns about responsible AI, Transparency in Data Usage 38% and Predictive Personalisation 34% highlight customer-centric AI. According to Table 2 Through Reliable Brand Experience 46% highlights the necessity of consistency to keep customers, while high-impact elements like Better Interaction with Customers 50% and Customised Incentives 54% highlight the significance of personalisation in fostering customer loyalty. Personalisation Predictive 38% and Data-Informed Perspectives 41% emphasise how important it is to comprehend client preferences in order to maintain engagement throughout time. New developments like Active Participation 28% and Gamification of loyalty programs 32% highlight the increasing significance of innovative, proactive interactions to preserve consumer investment and strengthen brand loyalty.

Table 3: Factors Influencing Sustainability Awareness Before & After AI Implementation

Factor	Description	%	Impact on Sustainability Awareness
Campaigns for Tailored Education	AI selects sustainability-related material based on user preferences.	58	Improved relevancy and consumer knowledge.
Showcasing Green Projects	AI highlights the company's environmentally friendly initiatives and accomplishments.	54	Improved impression of brand dedication.
Suggested Sustainable Products	AI uses consumer preferences to recommend eco-friendly products.	50	Promoted environmentally friendly shopping practices.
Operational Transparency	AI offers information on carbon footprints, product origins, and other topics.	47	Increased trust by making eco-efforts evident.
Sustainable Actions Gamified	AI uses prizes to encourage consumers to take part in green activities.	44	Increased interest in sustainability objectives.
Current Sustainability Information	AI provides real-time updates on the organization's sustainability objectives and benchmarks.	42	Kept clients updated and involved.
Cooperation with Sustainable Partners	AI demonstrates partnerships with eco-friendly companies.	40	Enhanced brand's image for being environmentally responsible.
Easy Green Decisions	AI helps consumers find and select environmentally sustainable options.	38	Made it easier to make sustainable decisions.
The Circular Economy's Promotion	AI promotes customer recycling, reuse, and resale initiatives.	34	Increased involvement in sustainability initiatives.
Forecasted Sustainability Perspectives	AI provides alternatives by predicting how consumer decisions will affect the environment.	30	Heightened consciousness of personal involvement.

Source: Self-survey

According to Table 3 Through AI's ability to inform and inspire consumers about sustainability is demonstrated by high-impact elements like Personalised Educational Campaigns 58% and Highlighting Green Initiatives 54%, while Sustainable Product Recommendations 50% have a direct impact on consumer decisions. Gamification of Sustainable Actions 44% and

transparency in operations 47% are examples of moderate-impact factors that highlight the significance of involvement and trust in increasing awareness. Predictive sustainability insights 30% and promoting the circular economy 34% are two emerging trends that demonstrate growing interest in creative, collaborative approaches to sustainability.

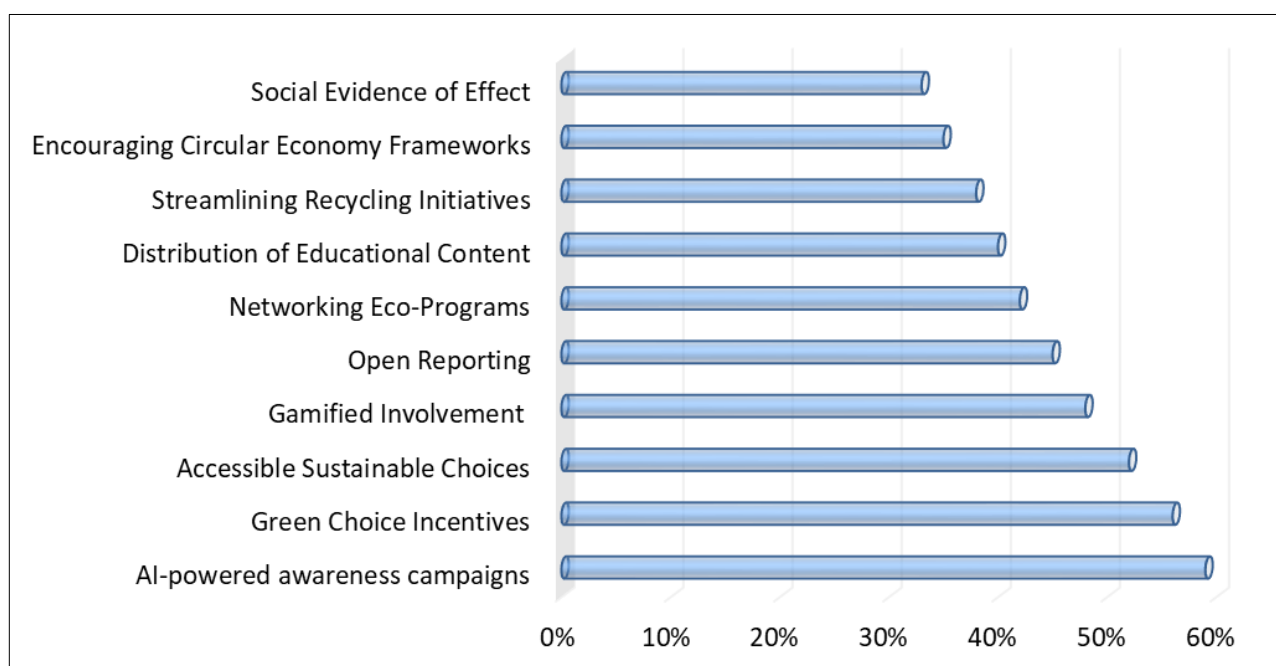
Table 4: An examination of the variables affecting customer satisfaction both before and after the use of AI

Factor	% of Respondents
Tailored Client Experiences	62%
Quicker Answering of Queries	59%
Proactive Provision of Services	56%
Higher-quality goods and services	50%
Reliable Multi-Channel Assistance	49%
Timely Reminders	47%
Open and Honest Communication	44%
Improved Loyalty Incentives	40%
Use of Feedback	38%
Streamlined Customer Service	35%

Source: Self-survey

According to Table 4 Through AI's capacity to provide efficient and customised interactions is demonstrated by high-impact variables like Faster Query Resolution 60% and Personalised Customer Experiences 63%, which dramatically increase satisfaction. The significance of anticipating and efficiently responding to client needs is emphasised by Proactive Service

Delivery 55% and Improved Product/Service Quality 52%. The growing significance of convenience and rewarding customer participation is highlighted by emerging trends like Enhanced Loyalty Rewards 40% and Simplified Customer Journey 35%, which concentrate on providing incentives and streamlining experiences.



Source: Self-survey

Diagram 3: An examination of the variables affecting involvement in sustainable projects both before and after the use of AI

According to diagram 3 High-impact elements such as AI-powered awareness campaigns 59% and incentives for green choices 56% are important drivers of participation, highlighting the role that rewards and education play in promoting engagement. The importance of ease and interactive engagement in increasing involvement is highlighted by

moderate-impact characteristics like Gamified Participation 48% and Easy Access to Sustainable Options 52%. New trends such as Social Proof of Impact 33% and Promoting Circular Economy Models 35% show the increasing emphasis on promoting group action and proving the benefits of sustainability initiatives.

6. Conclusion

Customer trust, contentment, and sustainability engagement are all greatly enhanced by the incorporation of AI into Sustainable Consumer Relationship Management (CRM). AI promotes more meaningful and pertinent customer interactions by improving CRM efficiency, responsiveness, and personalisation. It helps businesses anticipate needs, optimize resources, and align CRM practices with sustainable standards, reducing waste and environmental impact. AI also addresses data privacy and ethical data handling, which are crucial for building trust. Key engagement metrics have improved by 26.8% overall, according to the report, with sustainability awareness increasing by 26%, brand loyalty increasing by 13%, and consumer trust increasing by 22%. Participation in sustainable efforts increased by 34%, while customer satisfaction rose by 39%. These findings show that CRM driven by AI improves overall satisfaction, fosters stronger customer relationships, and raises awareness of sustainability. To preserve trust and fully utilise AI, companies must prioritise ethical data procedures and strike a balance between automation and human engagement.

7. Suggestion and Recommendation

Businesses should take into account a number of crucial tactics in order to optimise the potential of artificial intelligence (AI) in sustainable customer relationship management (CRM):

- **Improve tailored financial services:** AI is capable of analysing consumer profiles to provide customised services, such as insurance plans or SIPs. AI could be used by HDFC Life Insurance to make policy recommendations based on each customer's risk tolerance and financial objectives.
- **Enhance loyalty initiatives making use of AI:** Customers that behave consistently financially can be rewarded with AI. SBI might start a scheme in which consumers accumulate points for frequent purchases, which they could then exchange for fee exemptions or lower interest rates on loans.
- **Use predictive analytics to increase revenue:** AI finds opportunities for cross-selling, such suggesting a loan after seeing how a consumer saves money. Customers with large savings, for instance, may be eligible for personal loans from Axis Bank.
- **Encourage environmentally friendly financial services:** Promote online services over those conducted on paper. In order to encourage sustainability, ICICI can provide incentives to clients who choose e-statements.
- **Start financial education & sustainability:** AI is capable of client segmentation and individualised financial education. A bank might deliver customised content about green bonds and other ethical investment possibilities, for instance.
- **Use gamification to increase financial involvement:** To engage clients, provide obstacles related to investments or

saving. For consumers who reach monthly savings targets, a platform such as Paytm Money might provide incentives.

- **Boost customer service with AI-powered support:** Install AI technologies to provide round-the-clock client service. To increase client satisfaction, an AI assistant in a bank, for example, can help with loan applications and provide answers to frequently asked questions.

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