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Artificial Intelligence in Financial Services: Enhancing Efficiency and Customer Experience in Rural Odisha

Ramakrushna Nayakam[1], Kanhu Charan Purty[2]

[1]Lecturer in Commerce, Vikram Dev University, Odisha
[2]Research Scholar, KISS University, Bhubaneswar

Abstract

Artificial Intelligence (AI) is transforming financial services globally by enabling automation, personalization, and efficiency in service delivery. In India, rural regions such as Odisha face challenges like limited financial literacy, low digital adoption, and infrastructure barriers. AI-driven tools offer opportunities to improve customer experiences, enhance service efficiency, and ensure inclusive financial growth. This study examines the role of AI in financial services with a specific focus on rural Odisha. Using primary data collected from 400 respondents across Koraput, Malkangiri, and Rayagada districts, the study evaluates how AI applications such as chatbots, predictive analytics, fraud detection, and digital credit scoring influence customer satisfaction and efficiency. Data were analyzed using **SAS software** through descriptive statistics, factor analysis, regression modeling, and hypothesis testing. Results indicate that AI significantly enhances financial accessibility, service delivery speed, and customer trust. However, gaps remain in digital literacy, awareness, and infrastructural support. The study concludes that AI adoption in rural Odisha financial services requires a balanced approach combining technology, human support, and awareness campaigns. Policy recommendations emphasize financial literacy programs, infrastructure development, and localized AI applications to foster sustainable rural financial inclusion.

Keywords: Artificial Intelligence, Financial Services, Rural Odisha, SAS, Customer Experience, Efficiency

1. Introduction

Financial inclusion is a cornerstone of India's socio-economic development, especially in rural regions like Odisha, where over 80% of the population depends on agriculture and informal employment. Despite initiatives such as **PMJDY (Pradhan Mantri Jan Dhan Yojana)** and **UPI (Unified Payments Interface)**, rural populations face challenges in accessing efficient and reliable financial services.

Artificial Intelligence (AI) offers opportunities to bridge these gaps by automating decision-making, enhancing customer experience, and ensuring security. In rural Odisha, AI can assist in **digital loan processing, fraud detection, personalized financial advice, and multilingual chatbots**, thus

overcoming barriers of literacy and access. This research investigates the potential of AI in transforming financial services in rural Odisha, focusing on **efficiency improvement** and **customer experience enhancement**.

2. Literature Review

AI in financial services has been widely studied in global contexts. Studies by **Brynjolfsson & McAfee (2017)** highlight AI's role in automating tasks, while **McKinsey (2021)** identifies AI as a driver of banking efficiency and fraud detection.

In India, research by **NITI Aayog (2020)** stresses AI's potential in financial inclusion. However, **rural regions face unique challenges**-low literacy, poor connectivity, and mistrust of digital systems. **Das & Pradhan (2022)** found that AI-enabled banking in Odisha increased adoption of mobile banking services but highlighted infrastructural constraints.

Gaps exist in **empirical studies** analysing AI adoption in rural Odisha with statistical tools. This study addresses that gap using **SAS-based analysis** to quantify AI's impact on financial services.

3. Research Objectives & Hypotheses

Objectives

1. To evaluate the role of AI in improving efficiency of financial services in rural Odisha.
2. To analyse the impact of AI applications on customer experience and satisfaction.
3. To identify challenges in AI adoption in rural financial institutions.

Hypotheses

- **H1:** AI has a significant positive effect on efficiency of financial services in rural Odisha.
- **H2:** AI has a significant positive effect on customer experience in rural Odisha.
- **H3:** Infrastructure and digital literacy moderate the relationship between AI adoption and customer experience.

4. Methodology

Sample & Data Collection

- **Sample Size:** 400 respondents (bank customers & SHG members)
- **Sampling Technique:** Stratified random sampling (Koraput, Rayagada, Malkangiri districts)
- **Instrument:** Structured questionnaire (Likert scale: 1–5)

Variables

- **Independent Variables:** AI-based services (Chatbots, Loan automation, Fraud detection, Personalized banking)
- **Dependent Variables:** Efficiency (service speed, accuracy, accessibility) & Customer Experience (satisfaction, trust, ease of use)
- **Moderating Variables:** Infrastructure, Digital literacy

Software Used

Data analysed using **SAS 9.4** with:

- Descriptive statistics
- Reliability test (Cronbach's Alpha)
- Factor analysis
- Regression analysis
- Model fit indices

5. Data Analysis & Results

Table 1: Demographic Profile of Respondents (N=400)

Demographics	Categories	Frequency	%
Gender	Male	210	52.5%
	Female	190	47.5%
Age Group	18-30	140	35%
	31-45	160	40%
	46-60	100	25%
Education Level	Primary	90	22.5%
	Secondary	170	42.5%
	Graduate & Above	140	35%

Source: Primary Data

Table 2: Reliability Test (Cronbach's Alpha)

Variable	Items	Cronbach's Alpha
AI Service Efficiency	5	0.874
Customer Experience	6	0.892
Moderating Variables	4	0.861

Source: Primary Data

Table 3: Factor Analysis (KMO & Bartlett's Test)

Measure	Value
KMO Sampling Adequacy	0.823
Bartlett's Test of Sphericity	682.45

Source: Primary Data

Table 4: Regression Analysis (SAS Output)

Predictor Variables	β Coefficient	t-value	p-value	Result
AI → Efficiency	0.642	12.34	0.000	Supported
AI → Customer Experience	0.581	10.21	0.000	Supported
Infra × AI → Experience	0.328	4.12	0.002	Supported

Source: Primary Data

6. Findings & Discussion

The results indicate that AI significantly improves efficiency (β=0.642) and customer experience (β=0.581) in rural financial services. Respondents reported faster loan approvals, improved fraud detection, and better customer support through AI-driven tools. However, **digital literacy and infrastructure constraints** moderated the benefits of AI. This suggests that while technology adoption is beneficial, human support and local language-based AI tools remain essential.

7. Conclusion & Suggestions

AI has the potential to transform financial services in rural Odisha by enhancing efficiency and improving customer experiences. However, adoption success depends on **infrastructure, awareness, and inclusivity**.

Recommendations:

1. **Financial Literacy Programs** in local languages.
2. **Hybrid Service Model** (AI + human agents).
3. **Infrastructure Development** (digital connectivity, mobile penetration).
4. **Policy Support** from government and RBI for rural AI initiatives.

References

1. Brynjolfsson, E., & McAfee, A. (2017). *Machine, Platform, Crowd: Harnessing Our Digital Future.* Norton.
2. McKinsey Global Institute. (2021). *The State of AI in Financial Services.*
3. NITI Aayog. (2020). *Responsible AI for All.* Government of India.
4. Das, R., & Pradhan, S. (2022). AI-enabled banking in Odisha. *Indian Journal of Finance & Banking Studies.*
5. World Bank. (2021). *Financial Inclusion and Digital Finance.*