

The Role of Artificial Intelligence To Enhancing The Consumer Participation For Adoption Of The Digital Payment Systems In The Era Of 21 Century

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ABSTRACT

The dynamic evolution of digital technologies has fundamentally transformed the financial services landscape, leading to an accelerated transition toward cashless economies. Digital payment systems have emerged as integral components of financial infrastructure, offering users faster, safer, and more convenient methods of conducting transactions. However, the full potential of these systems remains unrealized due to persistent challenges related to user trust, security concerns, and low levels of digital literacy—particularly in developing regions. This research aims to investigate the role of Artificial Intelligence (AI) in enhancing consumer participation in the global adoption of digital payment systems. The dynamic evolution of digital technologies has fundamentally transformed the financial services landscape, leading to an accelerated transition toward cashless economies. A mixed-method research design was employed, combining structured survey data comprehensive analysis of secondary sources. The findings indicate that AI-based tools—such as fraud detection mechanisms, AI-powered chatbots, predictive analytics, and biometric authentication—significantly improve consumer trust, system efficiency, and overall satisfaction. Furthermore, socio-economic factors including income, education level, and generational differences were found to influence user adoption behavior. This study underscores the need for strategic integration of AI in digital finance platforms to overcome technological barriers and increase consumer engagement. It concludes with policy recommendations focused on strengthening digital literacy, expanding AI access, and promoting inclusive financial ecosystems on a global scale.

KEYWORDS: Artificial Intelligence, AI Adoption, Consumer Behavior, Digital Payments System

INTRODUCTION

1.1 Introduction of Digital Payments System

Digital payment systems, such as Unified Payment Interface (UPI), internet banking (NEFT, RTGS, IMPS), digital wallets, and Aadhaar Enabled Payment Systems (AEPS), have transformed consumer transactions by enabling cashless, secure, and real-time payments. The increasing reliance on these platforms has been accompanied by challenges regarding user trust, technological literacy, and fraud prevention. The mobile based e-payment wallets, the internet banking, the upi based e-payment modes, bar codes, point of sale and account to account transactions, plastic money (debit & credit card) and addhar enabled payment system (AEPS) etc.

1.2 Introduction of Artificial Intelligence (Ai)

The Artificial Intelligence refers to the simulation of human intelligence in machine that is programmed to make computer system like living thing as just like human brain in machine and after the Global pandemic (Covid-19) the Artificial intelligence playing such a very important role to increase the growth of Electronic Commerce as well as the growth in adoption rate of Electronic Payments System all over the world. The Machinery of Artificial Intelligence working very smartly and supporting to the users of E-Commerce and E-Payments with various useful tools and techniques like- Fraud Detection from the Digital Payments, Faster Payments Settlement, Early Damaged Protection of Transactions, Digital Payments Settlement Forecasting Uses of Physical Robot, AI Enabled Chatbot, Protection from the Password and OTP, Protection from the Unauthorized Links & Websites, Digital Payments Settlement Forecasting.

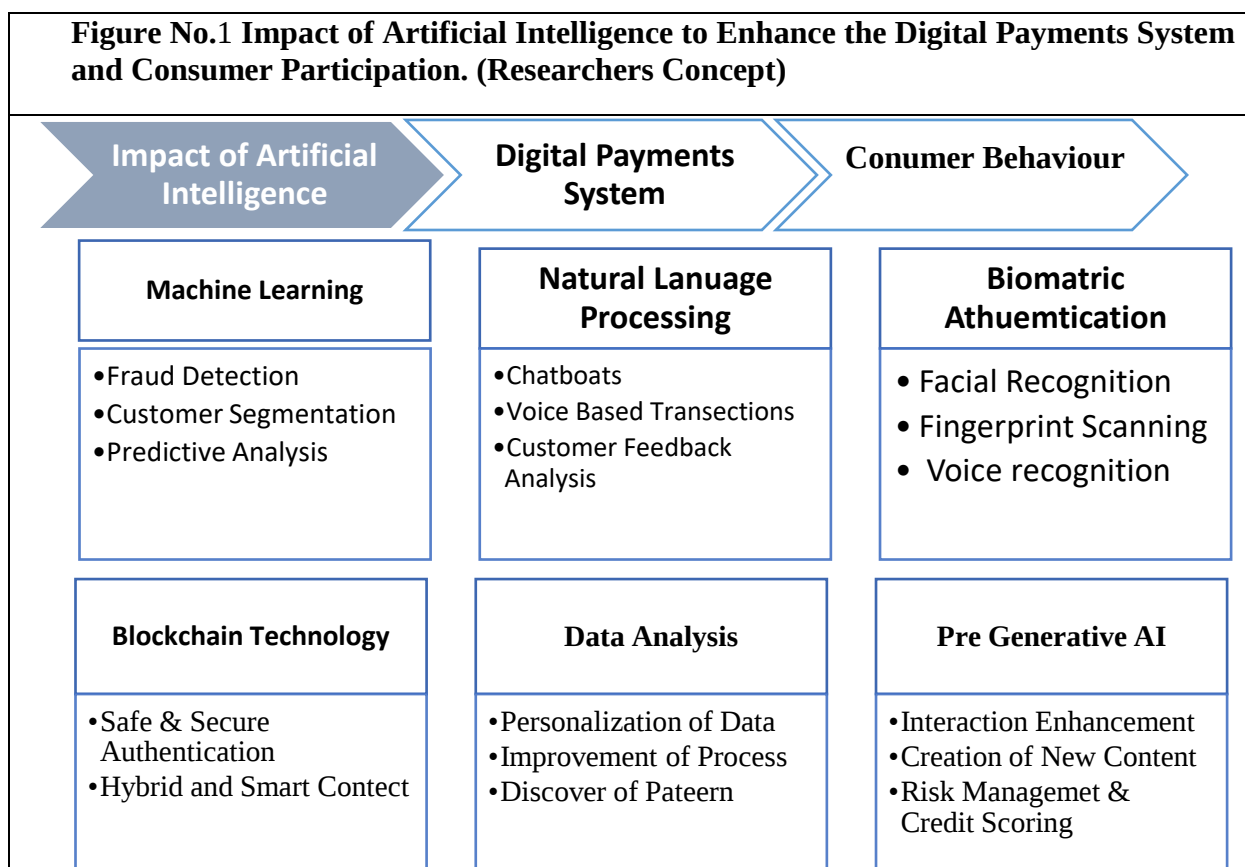
1.3 Introduction of Consumer Buying Behavior

Consumer Buying Behavior is a study of the decision-making process of customers for buying goods and services and acts that are involved in buying and using products and services. In the study of consumer buying behavior, customer satisfaction and fulfilment of the need for a particular product or service is very important for the overall growth and stability of a product in the market place is depends upon the quality of the product and after-sales service is very important for growth and survival of existing product.

1.4 Impact of Artificial Intelligence to Enhance The Adoption of Digital Payments System And Consumer Participation

The Artificial Intelligence refers to the simulation of human intelligence in machine that is programmed to make computer system like living thing as just like human brain in machine and after the Global pandemic (Covid-19) the Artificial intelligence playing such a very important role to increase the growth of Electronic Commerce as well as the growth in adoption rate of Digital Payments System in all over the world. Artificial Intelligence (AI) is playing such an important role to enhance the Digital Payments System with various tools and technologies likes-

- Machine Learning,
- Natural language Processing,
- Biometric Authentication,
- Block Chain Technology,
- Data Analysis and
- Pre Generative Artificial Intelligence.



REVIEW OF LITERATURE

There are various Review of literature reviewed by the various researchers on Digital Payments System, Artificial Intelligence and Consumer Behavior are as followings.

‘(Agrawal, 2010)’ Researcher has mentioned in their study about the cashless economy in India and its importance for the overall growth of Digital Payments. Electronic or digital modes of Payments are very powerful tools for reducing currency management expenditure, tracking transactions, reducing fraud activities during the transaction & also helpful in checking tax avoidance. The potential of a cashless economy in improving transparency and efficiency. ‘(Sammon, 2015)’ The Researcher has described the role of the uses of the Digital Payment in the 21st century in their study. The uses of Digital Payments System are increasing day by day in 21 centuries and it is increased over the years. The main point of the study is to find out what are the virtues’ of regarding the digital payment system in the future stand and noted a growing interest in mobile payments, highlighting the integration of digital tools in financial transactions. ‘(Bezovski, 2016)’ has mentioned in their study that the internet & e-commerce are the gateway for the Digital Payments System with the increment in technology. Users are adopting the near modes of payment system and how they will be beneficial for the users. The future of electronic payment wallets depends upon the security and privacy that are provided by e-wallet companies the dependency of e-wallets on security and user trust. ‘(Ravi, 2017)’ has explained in their study that India’s population belongs to rural areas so they play a very important role in the development of the economy with the help of information technology and communication network. The connectivity of the internet is the main reason for the low rate of adaptation of technology and this affects the adoption rate of the Digital Payments System in India discussed rural India's adaptation challenges, especially post-demonetization. ‘(Sumathy & Vipin, 2017)’ The Researchers have described in their study about digital payment or electronic payments, that the identification for growth of a cashless economy in India depends upon the minimum usage of currency and maximum usage of the Electronic Payments System. According to the study of the researchers, the main objective of the Electronic Payments System is to create the environment of a cashless economy or less cash economy after the demonetization. (Shanthini & Nallathmbi, 2018)’ The Researchers have discussed in their research study about the role of Consumer Buying behaviour for adoption of Electronic Payment System for create the environment for the cashless economy, as like Debit and Credit cards are used by consumers frequently but security & safety is a very important concern for adoption of the Electronic Payment System. In this era of advanced technology, users of Plastic Money like Debit and Credit Cards are mostly adopted this type of mode for settlement of electronic transactions. However, there remains a research gap regarding the extent of AI's influence on consumer adoption behavior and awareness of digital payment systems.

2.2 Research Gaps

- Limited focus on consumer adoption levels post- Artificial Inteligance implementation.
- Insufficient examination of consumer awareness about Artificial Inteligance -enabled digital payment modes.

CHAPTER NO.3 RESEARCH METHODOLOGY

3.1 Research Design

Exploratory research is designed to provide a background, to familiarize, and as the word implies, just “explore”, the general subject. A part of exploratory research is the investigation of relationships among variables without knowing why they are studied. Researcher has also adopted the Descriptive Research Design for study about the Consumer Buying Behavior for Electronic Payments System.

3.2 Universe Population & Sample Area

The universe of the study covers PAN India, with Jabalpur, Madhya Pradesh as the primary sample location. Simple random sampling was applied, ensuring equal probability of selection. A total of 225 valid responses were analyzed from 328 numbers of total respondents.

Samples were collected from different sample areas of the universe of the population targeted. Sample areas were **Jabalpur** city of **Madhya Pradesh State**, was the population of the study. PAN India is the universe of the study. This study adopts both exploratory and descriptive designs. Exploratory research offers a conceptual understanding, while descriptive analysis issued to assess consumer behavior.

3.3 Objectives

- To analyze the importance and challenges of Digital Payment Systems following integration of Artificial Intelligence .
- To study consumer awareness levels regarding Artificial -driven safety and security related features. Intelligence
- To assess the impact of Artificial Intelligence tools on global consumer participation and satisfaction with Digital Payments System

3.4 Hypotheses

- **H01:** The user-friendly design of Artificial Intelligence does not influence global consumer adoption of digital payments.
H1: The user-friendly design of Artificial Intelligence significantly influences global consumer satisfaction in digital payments.
- **H02:** Digital banking infrastructure has no effect on consumer satisfaction post-AI integration.
H2: Digital banking infrastructure significantly affects consumer satisfaction post-AI integration.

Chapter No.4 Data Collection, Analysis & Interpretations

Primary data was collected via structured questionnaires. Data was analyzed using statistical tools to determine relationships between AI features and consumer participation.

PART A

4.1 The Demographical Analysis of Data of Area, Age, Sex, Education, Income And Marital Status

Table No.1				
Areas	Respondents from Urban Areas	Respondents from Semi Urban Areas	Respondents from Rural Areas	Total Numbers of Respondents
Response	98	77	50	225

Interpretation:

The following Table No.1 of Area of belongings of the respondents and divided into three categories,urban, semi urban and rural areas of belongings of the respondents. Mostly respondent (98) are belongings to the urban areas in demographical analysis.

Table No.2				
Gender	Male Respondents	Female Respondents	LGBT Respondents	Total Numbers of Respondents
Response	104	97	24	225

Interpretation:

The following Table No.2 of Gender category of the respondents are divided into three categories, Male, Female and LGBT category of the respondents. Mostly respondent (104) are belongings to male category of gender analysis in demographical analysis.

Table No.3				
Education	Higher Educated	Educated	Illiterate	Total numbers of Respondents
Response	85	104	36	225

Interpretation:

The following Table No.3 of education status of the respondents are divided into three categories, Highly educated, educated and illiterate respondents. Mostly respondent (104) are belonging into the category of the educated category in demographical analysis.

Table No.4				
Marital Status	Married Respondents	Unmarried Respondents	Others Respondents	Total numbers of Respondents
Response	102	77	46	225

Interpretation:

The following Table No.4 of Marital Status of the respondents are divided into three categories, Married, Unmarried and others respondents. Mostly respondents (102) are belonging into the category of the Married group in demographical analysis.

Table No.5				
Age Group	Age Between (In Years) 15-30	Age Between (In Years) 31-45	Age Between (In Years) 46-60	Total numbers of Respondents
Response	55	104	66	225

Interpretation:

The following Table No.5 of age group of the respondents are divided into three categories, 15-30, 31-45 and 46-60 years of age. Mostly respondent (104) are belonging into the category of the age group of 31-45 years of age group in demographical analysis.

Table No.6				
Income Level	Income Between 2000-20000	Income Between 21000-40000	Income Between 41000-60000	Total numbers of Respondents
Response	77	85	63	225

Interpretation:

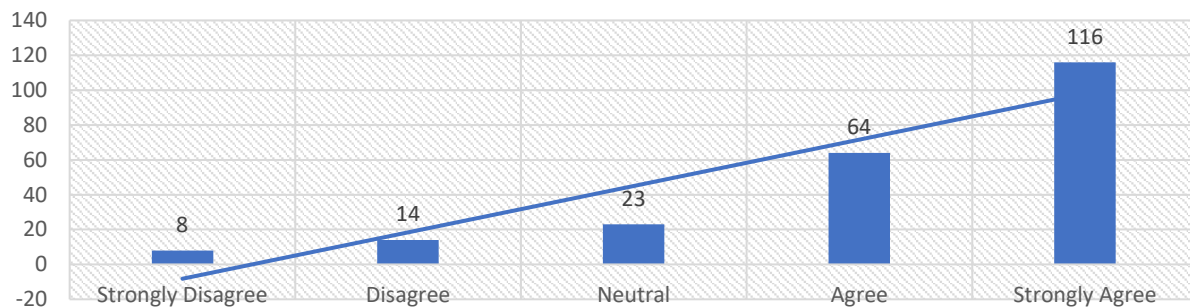
The following Table No.6 of income level of the respondents are divided into three categories 2000-20000, 21000-40000 and 41000-60000 thousands INR. Mostly respondent (85) are belonging into the category of the income group of 21000-40000 income group in demographical analysis.

PART B

Descriptive Analysis of Data

Table No.7					
1.Does the Artificial Intelligence System is helpful to enhancing the customer experience for adoption of Digital Payments System ?					
Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Response	8	14	23	64	116

Graph No.1 Artificial Intelligence System is helpful to enhancing the customer experience for adoption of Digital Payments System.



Interpretation:

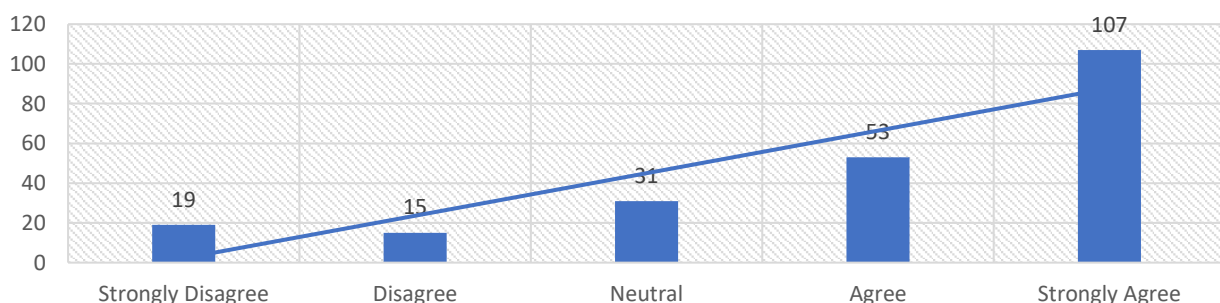
The findings indicate that a significant majority of the respondents hold a favourable view of the role of Artificial Intelligence in digital payments. Specifically, 80.0% of the participants (28.44% Agree and 51.56% Strongly Agree) affirm that AI systems positively enhance the customer experience associated with digital payment platforms. Conversely, only 9.78% of the respondents expressed a dissenting opinion (6.22% Disagree and 3.56% Strongly Disagree), reflecting a relative proportion of scepticism. The remaining 10.22% remained neutral, which may imply either limited exposure to AI-enabled services or uncertainty about their impact. The most frequent response, “Strongly Agree” (51.56%), underscores strong user confidence in AI’s role. These insights support the growing consensus in fintech literature that AI technologies can significantly streamline, personalize, and secure the user journey within digital financial systems.

Table No. 8

2. Does the Artificial Intelligence’s fraud detection and preventions techniques is helpful to enhance the users interest for adoption of digital Payments System?

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Response	19	15	31	53	107

Graph No.2 The Artificial Intelligence’s fraud detection and preventions techniques is helpful to enhance the users interest for adoption of digital Payments System.

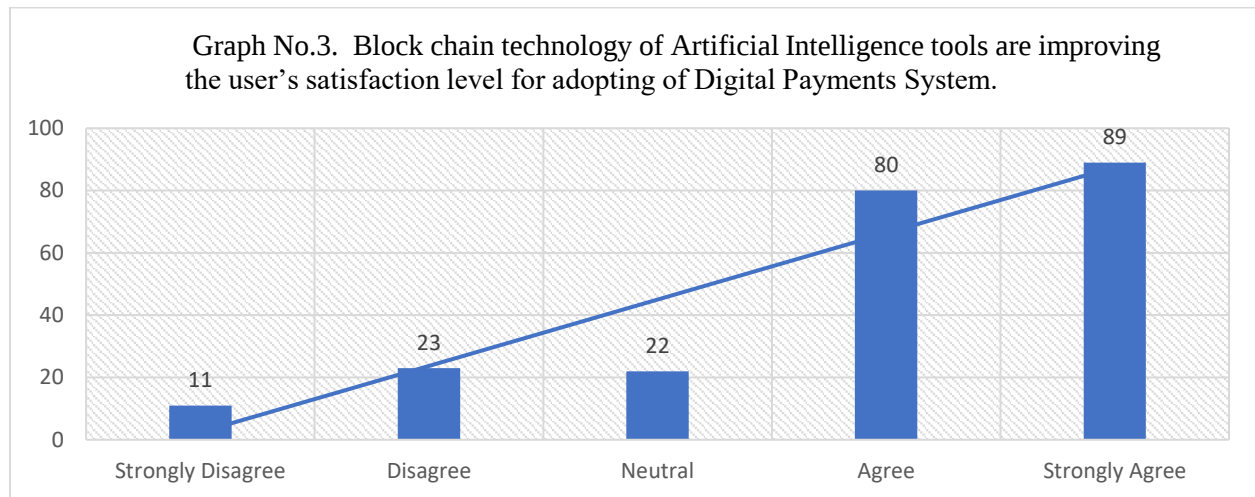


Interpretation:

A majority of respondents (107 out of 225, or 47.56%) Strongly Agree that AI-based fraud detection techniques encourage the adoption of digital payment systems. 53 respondents (23.56%) Agree, reinforcing the positive sentiment. Together, 71.11% (160 out of 225) of participants have a positive perception. Only 7.56% (17.1%) expressed disagreement (Strongly Disagree + Disagree). 31 respondents (13.78%) are neutral. The data clearly indicates that most users believe AI-driven fraud prevention increases their interest and trust

in adopting digital payment systems. This highlights the importance of integrating secure, intelligent fraud prevention mechanisms to boost user confidence and adoption rates.

Table No. 9					
3. Does the block chain technology of Artificial Intelligence tools are improving the user's satisfaction level for adopting of Digital Payments System?					
Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Response	11	23	22	80	89

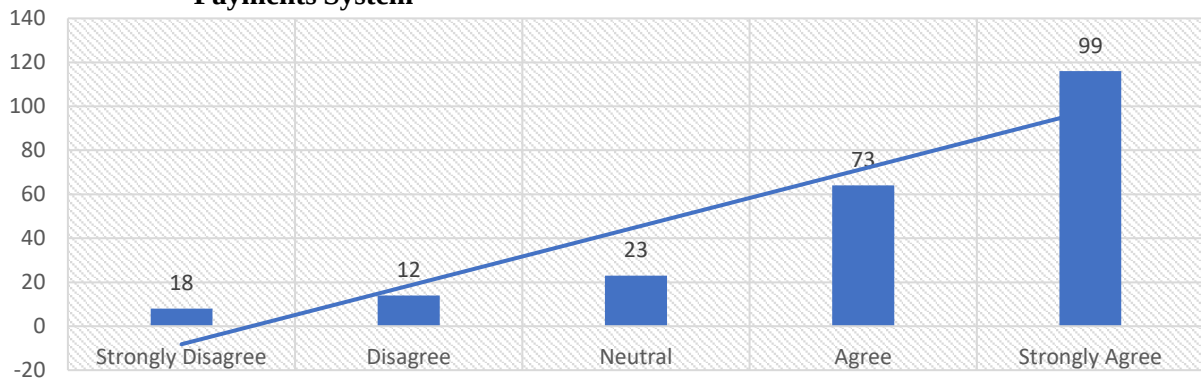


Interpretation :

The analysis highlights that blockchain technology, when integrated with Artificial Intelligence (AI) tools, significantly contributes to enhancing user satisfaction in the context of digital payment system adoption. Out of a total of 225 respondents, a substantial majority—comprising 35.6% who agreed and 39.5% who strongly agreed—expressed positive views on the impact of blockchain-enabled AI tools. This indicates that approximately 75.1% of users perceive these technologies as effective in improving their overall satisfaction with digital transactions. In contrast, only a minor segment of the sample population expressed dissatisfaction, with 10.2% disagreeing and 4.9% strongly disagreeing. Additionally, 9.8% of respondents remained neutral. These findings suggest that the secure, transparent, and decentralized nature of blockchain—combined with the intelligent, adaptive features of AI—helps to build trust and reliability in digital financial platforms.

Table No. 10					
4. Does the Personalization and Customer experience tools of Artificial Intelligence enhancing the customer experience for adoption of Digital Payments System?					
Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Response	18	12	23	73	99

Graph 4. Personalization and Customer experience tools of Artificial Intelligence enhancing the customer experience for adoption of Digital Payments System



Interpretation:

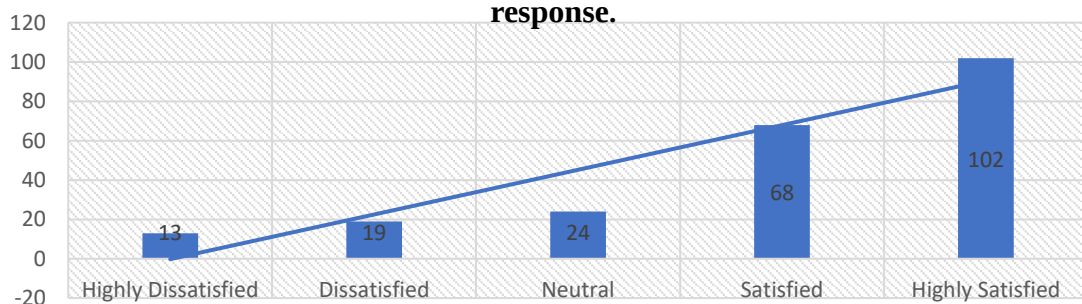
The findings indicate that a significant majority of the respondents hold a favourable view of the role of Artificial Intelligence in digital payments. Specifically, 80.0% of the participants (28.44% Agree and 51.56% Strongly Agree) affirm that AI systems positively enhance the customer experience associated with digital payment platforms.

Conversely, only 9.78% of the respondents expressed a dissenting opinion (6.22% Disagree and 3.56% Strongly Disagree), reflecting a relatively small proportion of scepticism. The remaining 10.22% remained neutral, which may imply either limited exposure to AI-enabled services or uncertainty about their impact. The most frequent response, “Strongly Agree” (51.56%), underscores strong user confidence in AI’s role. These insights support the growing consensus in fintech literature that AI technologies can significantly streamline, personalize, and secure the user.

Table No. 11

Table No. 11					
5. Are you satisfied with the Biometric Authentication techniques of Artificial Intelligence system for solving the problem of Digital Payments System safety and Security related measures?					
Statement	Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly Satisfied
Response	13	19	24	68	102

Graph No. 5 Satisfaction level with the Biometric Authentication techniques of Artificial Intelligence system for solving the problem of Digital Payments System safety and Security related measures response.



Interpretation:

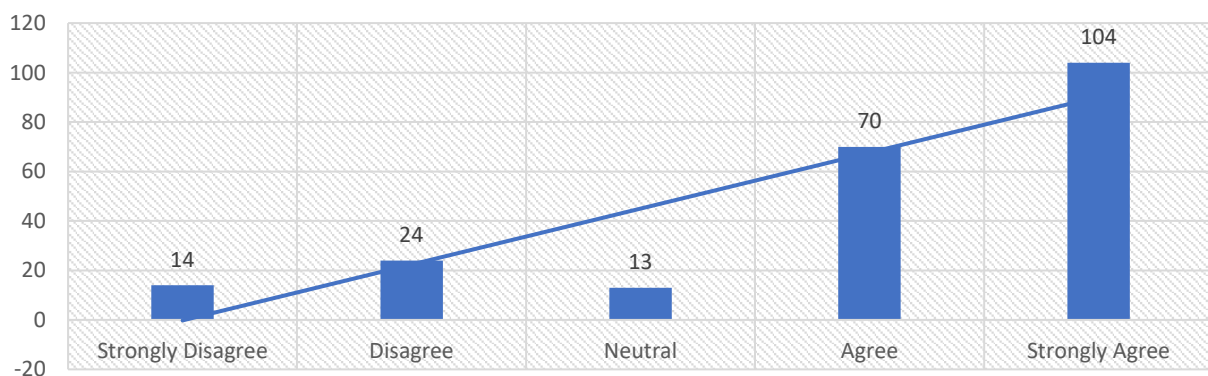
The survey sought to assess users' satisfaction with the Biometric authentication methods- such as fingerprint, facial recognition and iris detection –integrated through Artificial Intelligence(AI) to address safety and security concerns in Digital Payments System. The Findings indicate a strong positive sentiment among respondents regarding the effectiveness of AI-driven biometric solutions. Out of the total participants, 49.0% (n = 102) reported being highly satisfied, while 32.7% (n = 68) expressed satisfaction. This cumulatively accounts for 81.7%, suggesting a high level of user confidence in the reliability and security offered by biometric authentication mechanisms. A neutral stance was observed in 11.5% (n = 24) of the participants, indicating a moderate or undecided perception, which may stem from limited exposure or mixed experiences with biometric technologies. On the contrary, only a small fraction exhibited dissatisfaction: 9.0% (n = 19) were dissatisfied, and 6.2% (n = 13) were highly dissatisfied.

Table No. 12

6. Are you satisfied with the process of automotive KYC of Artificial Intelligence System for identification of real users to increase satisfaction and trust for higher rate of adoption for Digital Payments System?

Statement	Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly Satisfied
Response	14	24	11	70	104

Graph No.6. Satisfaction level with the process of automotive KYC of Artificial Intelligence System for identification of real users to increase satisfaction and trust for higher rate of adoption for Digital Payments System.



Interpretation

The survey question aimed to assess user satisfaction with the AI-based automotive KYC (Know Your Customer) process in terms of its role in identifying real users and building trust and satisfaction to support the wider adoption of digital payment systems. Out of a total of 223 respondents: A significant majority (70 + 104 = 174 respondents, or 79.09%) reported being either Satisfied or Highly Satisfied. Only 14 respondents (6.36%) reported being Highly Dissatisfied, and 24 respondents (10.76%) were Dissatisfied, making a combined dissatisfaction rate of 17.12%. 11 respondents (4.93%) remained Neutral, indicating uncertainty or mixed feelings.

CHAPTER NO 5. FINDINGS, CONCLUSION, RECOMMENDATIONS & LIMITATIONS

5.1 findings

- **AI Significantly Enhances Consumer Experience**

80% of respondents agreed or strongly agreed that AI systems improve the digital payment user experience, indicating a high level of satisfaction. AI personalization tools and predictive systems

enhance customer interaction with digital platforms.

- **AI-Based Fraud Detection Increases Trust**

Over 71% of participants believe that AI's fraud detection capabilities boost trust and encourage wider adoption of digital payments. This shows that intelligent fraud protection is a key enabler in increasing user confidence.

- **Blockchain & AI Improves User Satisfaction**

Approximately 75% of users reported that blockchain technology integrated with AI improved their satisfaction with digital payments. The combination enhances transparency, security, and trust.

- **Biometric Authentication by AI is Well Accepted**

Around 82% of respondents were satisfied or highly satisfied with AI-based biometric authentication methods (fingerprint, face recognition). This shows strong trust in AI-driven identity verification mechanisms.

- **AI-Powered KYC Process Enhances Trust**

79% of users expressed satisfaction with automated KYC (Know Your Customer) processes powered by AI. This result reflects increased trust in the system and contributes to the wider adoption digital payment systems.

- **Socio-Demographic Factors Influence Adoption**

Factors such as income level, education, and age group significantly influenced user behavior and attitudes toward AI-enabled digital payment adoption.

- **Consumer Awareness Still Needs Improvement**

While many users have positive experiences, some respondents remained neutral, indicating limited exposure or understanding of AI-enabled payment features. This underscores the need for AI awareness and digital literacy campaigns, especially in rural and semi-urban area.

5.2. Conclusion

This study comprehensively examined the role of Artificial Intelligence (AI) in enhancing consumer participation for the global adoption of digital payment systems. Through an in-depth analysis of AI applications—such as personalization, fraud detection, customer experience tools, and decision support systems—the research highlights that AI significantly influences consumer trust, satisfaction, and engagement with digital payments. The findings from the primary survey indicate strong consumer agreement on the positive impact of AI-powered features in promoting ease of use, security, and reliability in digital transactions.

Moreover, the study underscores the necessity of integrating AI with consumer-centric strategies to overcome adoption barriers, especially in developing economies. By fostering transparency, increasing awareness, and continuously innovating AI applications, stakeholders can drive higher user acceptance and satisfaction. Ultimately, the convergence of AI and digital finance offers promising pathways to accelerate the shift toward a cashless, inclusive global economy.

5.3. Recommendations

. Major Recommendations of the Research Paper:

- **Launch AI-Based Consumer Awareness Campaigns:**

Special emphasis should be placed on rural and semi-urban areas to bridge the digital divide and improve understanding and trust in AI-enabled digital payment tools.

- **Integrate Digital Literacy into Education Curricula:**

National education programs should include digital literacy and AI-related content preparing future consumers to engage safely and confidently with digital payment systems.

- **Establish National Digital Payment Dispute Resolution Authorities:**

A central authority should be formed to handle digital transaction disputes, building user confidence by ensuring protection and accountability.

- **Promote Real-Time AI-Based Fraud Detection Tools:**

Wider deployment of AI-powered security mechanisms such as real-time fraud monitoring, biometric authentication, and predictive analytics to increase consumer trust and reduce

cybercrime.

- **Encourage Use of Personalization and AI Chatbots:**

Enhance user experience and engagement by implementing AI-powered chatbots and personalized interfaces, which can guide, support, and educate users during digital transactions.

5.4. Limitations

- Data is limited to a specific year and region.
- Rapid technological advancements may outpace current research findings.
- Variability in digital literacy and infrastructure across regions.

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