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The Role of Fintech-Driven Artificial Intelligence Systems to Enhancing Consumer Adoption of Digital Payments System Globally: An Empirical Study of Cybersecurity, Blockchain Technology & Digital Fraud Concerns

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ABSTRACT

The adoption of Digital Payment Systems (DPS) has transformed financial transactions by offering speed, convenience, and accessibility, this rapid digitalization has also increased exposure to cybersecurity threats and digital fraud. Incidents such as phishing, identity theft, malware attacks, and unauthorized transactions pose serious challenges to consumers and financial institutions, ultimately affecting trust and adoption rates. This research paper examines the relationship between cybersecurity risks and digital fraud in Digital Payments Systems, identifies major threat vectors, and evaluates preventive measures including regulatory frameworks, technological solutions, and consumer awareness. The rapid diffusion of Digital Payment Systems (DPS) in India has transformed consumer payment behaviour, shifting transactions from cash-based to digital platforms such as UPI, NEFT, RTGS, IMPS, AEPS, digital wallets, and Point of Sale L(PoS) systems. This transformation has been driven by technological advancement, government initiatives toward a cashless economy, and increased smartphone penetration. 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. The findings indicate that AI-based tools—such as fraud detection mechanisms, I-powered catboats, 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 behaviour.

1.1 INTRODUCTION OF FINTECH,DIGITAL PAYMENTS SYSTEM,CYBER SECURITY, ARTIFICIAL INTELLIGENCE (AI) & BLOCKCHAIN TECHNOLOGY

Financial technology has emerged as one of the major drivers of transformation in the global financial sector. Fintech combines financial services with technological innovation and has introduced new approaches to payments, banking, lending, investment, insurance and personal financial management. India has experienced substantial growth in digital financial services. Smartphones, internet connectivity, mobile banking and digital payment platforms have contributed to changes in consumer behaviour and financial service delivery. Digital payments have made financial transactions faster and more convenient, while technological innovations have created new opportunities for businesses and financial institutions.

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Artificial Intelligence represents another important dimension of this transformation. However, increased dependence on technology also creates challenges related to cybersecurity, privacy, algorithmic risks and digital fraud.

1.1.INTRODUCTION OF DIGITAL PAYMENTS SYSTEM

Electronic 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.

1.1.2 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 Digital 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 Chabot, Protection from the Password and OTP, Protection from the Unauthorized Links & Websites , Digital Payments Settlement Forecasting.

1.1.3 INTRODUCTION OF CYBER SECURITY

Phishing and social engineering attacks involve deceptive communication designed to trick users into revealing sensitive information such as passwords, PINs, or one-time passwords. These attacks exploit human behaviour rather than technical weaknesses and remain one of the most common causes of digital fraud in electronic payments Malware and Hacking Attacks. Malware attacks target users' devices or financial institution systems to gain unauthorized access to transaction data. Trojans, spyware, and key loggers are frequently used to capture sensitive information, leading to financial losses and data breaches. Card-Not-Present and Identity Theft Fraud Card-not-present fraud occurs when stolen card details are used for online transactions without physical verification. Identity theft further exacerbates this problem by allowing fraudsters to impersonate legitimate users and access digital payment accounts.

1.1.4 INTRODUCTION BLOCKCHAIN TECHNOLOGY

Block chain technology is an advanced database mechanism that allows transparent information sharing within a business network. A block chain database stores data in blocks that are linked together in a chain.

1.1.5 INTRODUCTION OF DIGITAL FRAUD

1.1.5.1 Factors Contributing Digital Fraud

- **Technological Complexity**

  The integration of multiple digital platforms, third-party applications, and open banking APIs increases system complexity and security vulnerabilities. Weak authentication mechanisms and outdated systems further elevate fraud risks.

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- **Lack of Consumer Awareness**

  Limited digital literacy and lack of awareness regarding cybersecurity practices make consumers vulnerable to fraud. Users often unknowingly share confidential information or fall victim to fraudulent links and applications.

- **Regulatory and Enforcement Challenges**

  Although regulatory frameworks exist, inconsistent enforcement and rapidly evolving fraud techniques make it difficult to maintain comprehensive protection against cyber threats. Digital Fraud or Cyber Fraud is the unethical activity are p1.4 Impact of Artificial 1.4 Impact of The integration of multiple digital platforms, third-party applications, and open banking APIs increases to enhance the adoption of FinTech-driven Artificial Intelligence for Digital Payments System and Consumer Participation.

1.2 IMPACT OF FINTECH DRIVEN ARTIFICIAL INTELLIGENCE SYSTEM TO ENHANCE THE ADOPTION OF DIGITAL PAYMENTS SYSTEM AND CONSUMER PARTICIPATION.

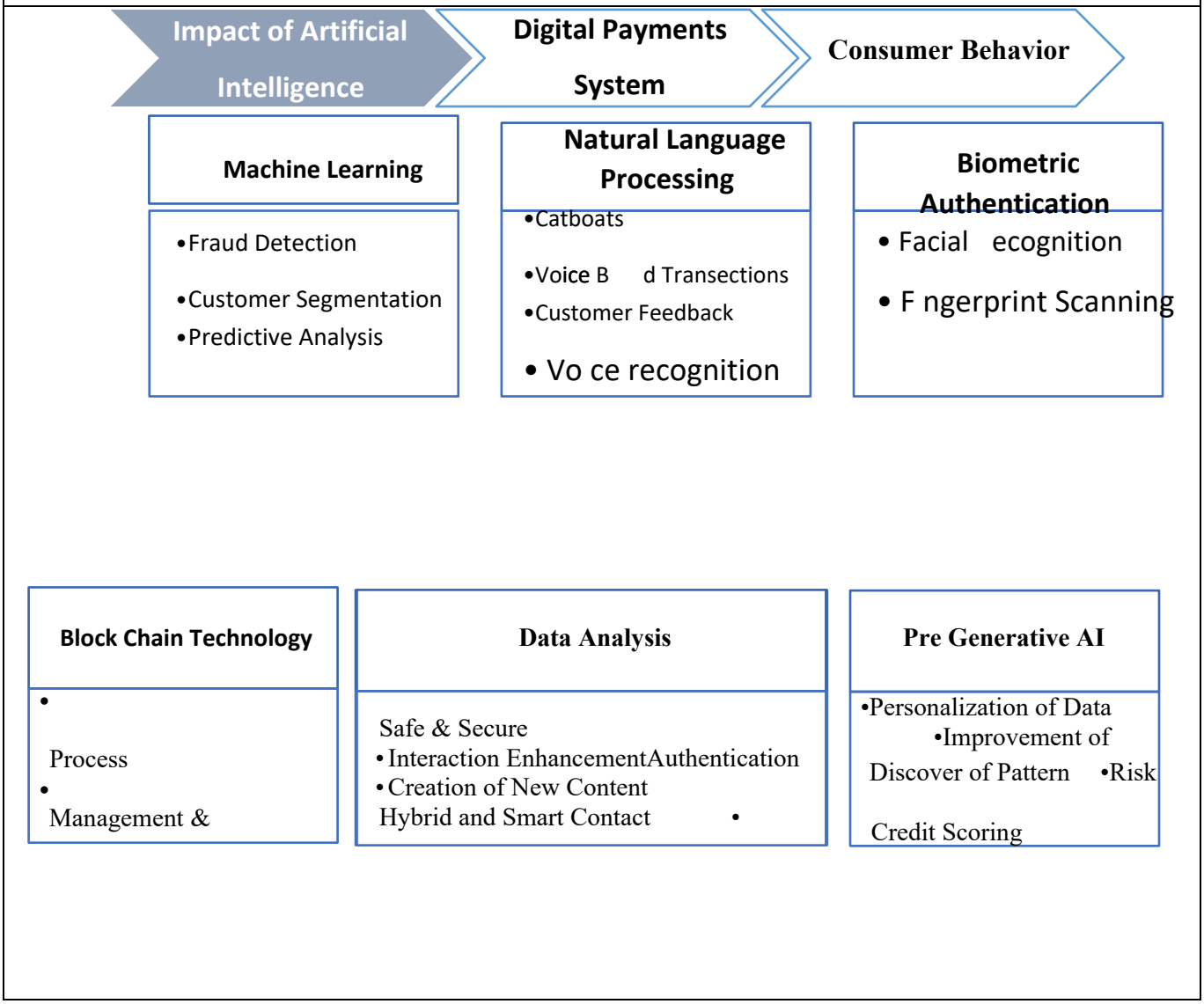
The Artificial Intelligence refers to the simulation of human intelligence in machine that is programmed to make computer system like living thing as just like human brain in machine and after the Global pandemic (Covid-19) the Artificial intelligence playing such a very important role to increase the 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 and
- Data Analysis

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Figure No.1 Impact of Artificial Intelligence to Enhance the Digital Payments System and Consumer Participation. (Researchers Concept)



Pre Generative Artificial Intelligence performed through the online platforms and digital technology to device people for financial gain, stealing personal data or gaining unauthorized access. The various methods of Digital Fraud are used by the hackers like phishing, malware, spam mail, fake websites and unauthorised links.

2. REVIEW OF LITERATURE

Ghaith (2022) The Researcher has described the Digital Consumer Behaviour in their study as online consumption allows the consumers to learn about the latest trends, sellers offers, discount offers & other promotional schemes to consumers & making the interaction with the other consumers & provides a high level of entertainment during digital & online shopping. **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 have mostly adopted this type of mode for settlement of Digital transactions. **Bezovski, (2016)** has mentioned in their

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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 and the dependency of e-wallets on security and user trust. **Acquisti et al., (2015)** has mentioned in their study that privacy is the big concern when monitoring customer data for fraud detection. The main challenge with the Digital Payments System is the Cyber Fraud and Cyber Security related threads directly affecting the adoption of Digital Payments System by the users and the privacy related doubt s are affecting the users mind for decision making for adoption of Digital Payments System with Cyber security related concern. **Briggs & Brooks (2011)** The Researchers have described the Digital Payments System as a form of interconnection between one party and individuals aided by banks or any other financial sector & inter-switch houses that enable all transactions electronically settled by electronic service providers and internet banking service providers with the help of an internet network.

2.2 RESEARCH GAPS

Despite the growing body of literature on Digital Payments Systems (DPS), several critical gaps remain. **First** limited focus on consumer adoption levels post- Artificial Intelligence implementation. **Second,** Insufficient examination of consumer awareness about Artificial Intelligence-enabled digital payment modes.

Third, cybersecurity and digital fraud are frequently examined as independent constructs, resulting in a fragmented understanding of their combined influence on consumer adoption decisions. India represents one of the fastest-growing digital payment ecosystems globally, empirical evidence grounded in the Indian consumer context remains insufficient, particularly outside metropolitan regions. **Fourth,** the literature inadequately integrates psychological and perceptual dimensions such as perceived vulnerability, trust erosion, and risk tolerance within established technology adoption frameworks. Finally, most prior studies focus on initial adoption intention towards the Digital Payments System.

3. RESEARCH METHODOLOGY

3.1Research 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 Behaviour 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 v**alid responses were analysed from **310** 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 behaviour.

3.3 OBJECTIVES

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- To Explore the importance and challenges of Digital Payment Systems following integration of Artificial Intelligence from prevention with Cyber security &Digital Frauds.
- To Measure consumer awareness levels regarding Artificial -driven safety and security related features for adoption of Digital Payments System Globally.
- To Study of impact of Artificial Intelligence tools on global consumer participation and satisfaction with Digital Payments System with modern fraud prevention tools.

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.

4.DATA COLLECTION, ANALYSIS & INTERPRETATION

PART A

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

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	97	77	51	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 (97) are belongings to the urban areas in demographical analysis.

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Table No.2				
Gender	Male Respondents	Female Respondents	LGBT Respondents	Total Numbers of Respondents
Response	103	98	24	225

Interpretation:

The following Table N o.2 of Gender category of the respondents are divided into three categories, Male, Female and LGBT category of the respondents. Mostly respondent (103) 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 belongings 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	78	47	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 belongings into the category of the Married group in demographical analysis.

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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	103	67	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 (103) are belongings 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:

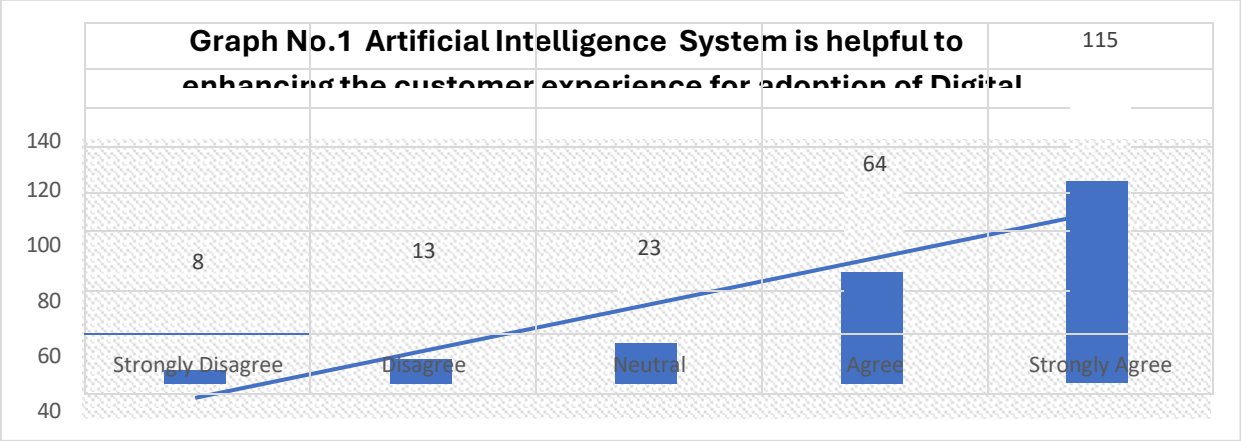
The following Table No.6 of income level of the respondents are divided into three categories 2000-20000, 21000-40000 and 41000-60000 thousands INR. Mostly respondent (85) are belongings into the category of the income group of 21000-40000 income group in demographical analysis.

5.FINDINGS, CONCLUSION,

Table No.7					
1.Does the Artificial Intelligence System is helpful to enhancing the customer experience for adoption of Digital Payments System ?					
Statement	Storngly Disagree	Disagree	Neutral	Agree	Strongly Agree
Response	8	13	23	64	115

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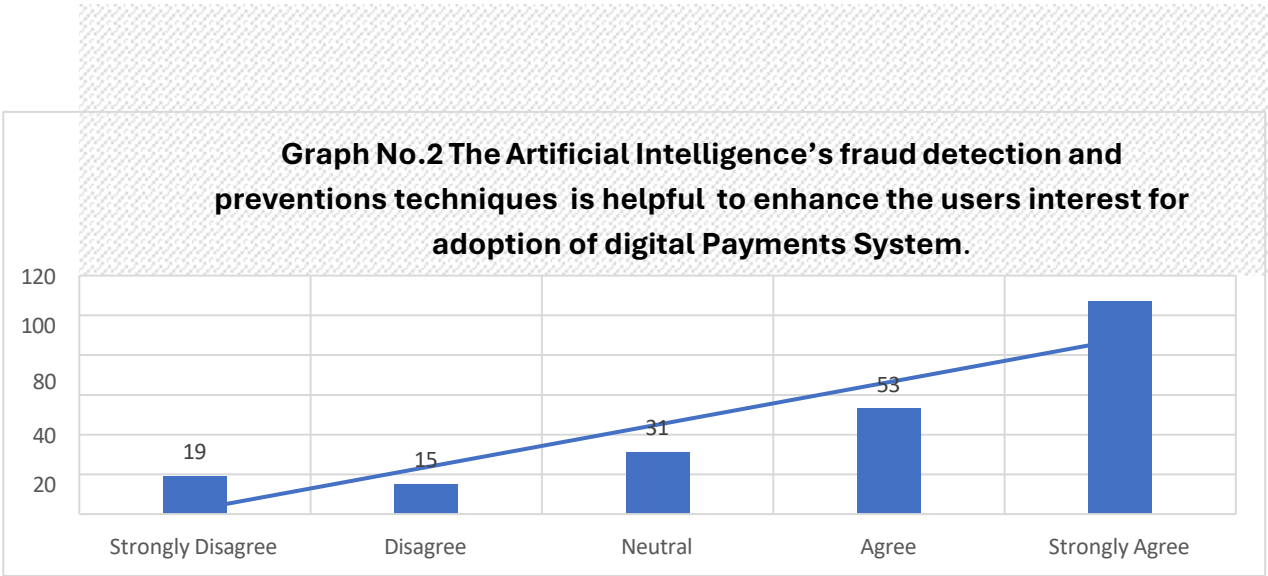
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Interpretation:

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 kkthat 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 aoportion 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?



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Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Response	19	14	31	53	106

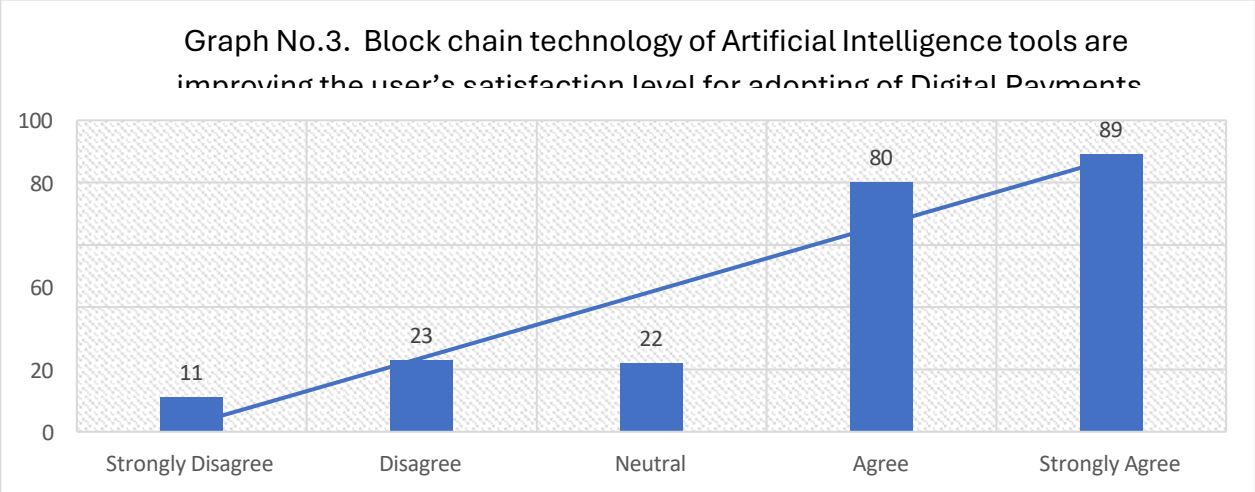
Interpretation:

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 trusin 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 :

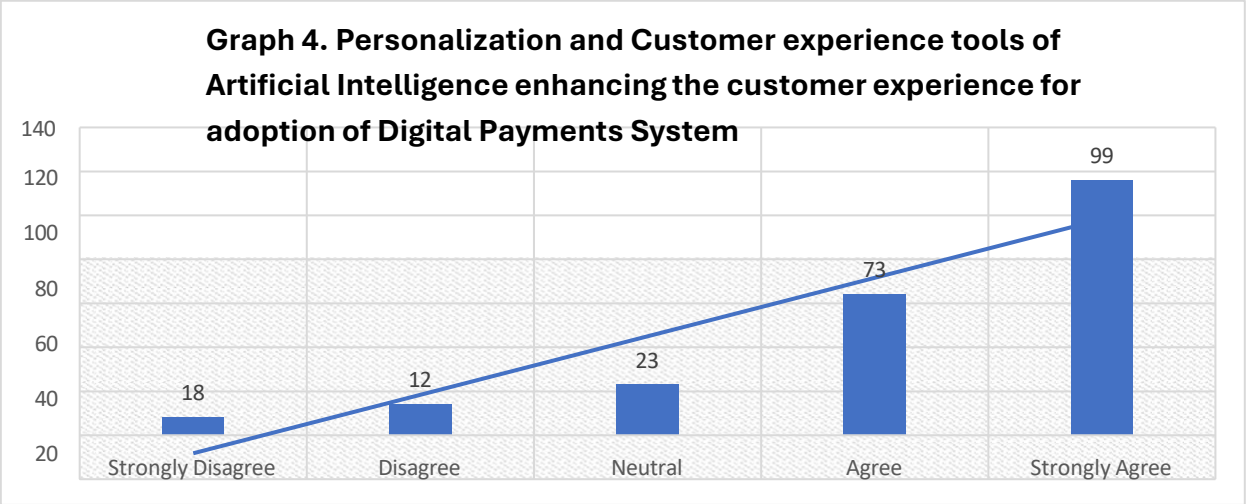
The analysis highlights that block chain technology, when integrated with Artificial Intelligence (AI) tools, significantly contributes to enhancing user satisfaction in the context of digital payment system adoption. Out of a total of 225 respondents, a substantial majority—comprising 35.6% who agreed and 39.5% who strongly agreed—expressed positive views on the impact of blockchain-enabled AI tools. This indicates that

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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



Interpretation:

The findings indicate that a significant majority of the respondents hold a favorable 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 skepticism. 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.

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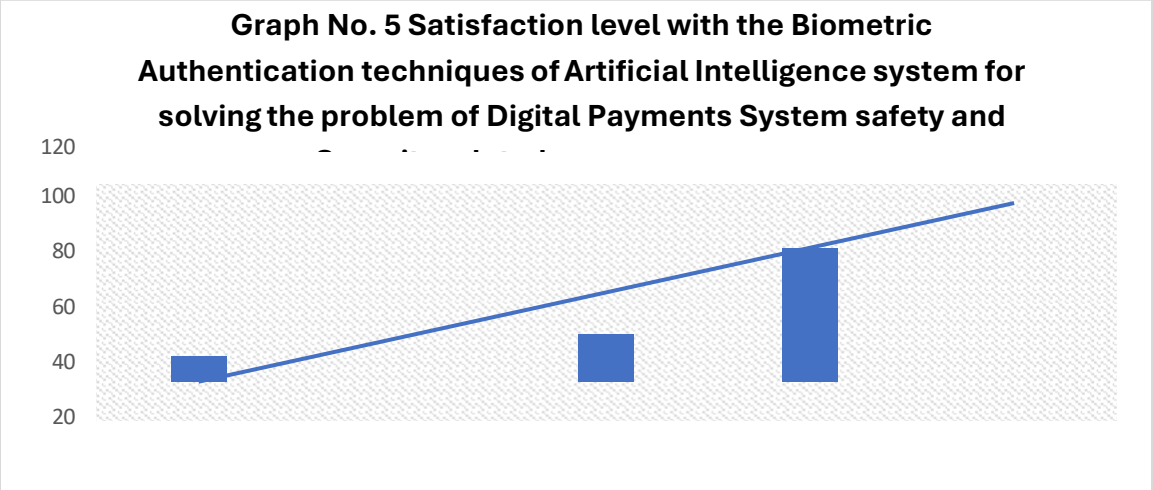
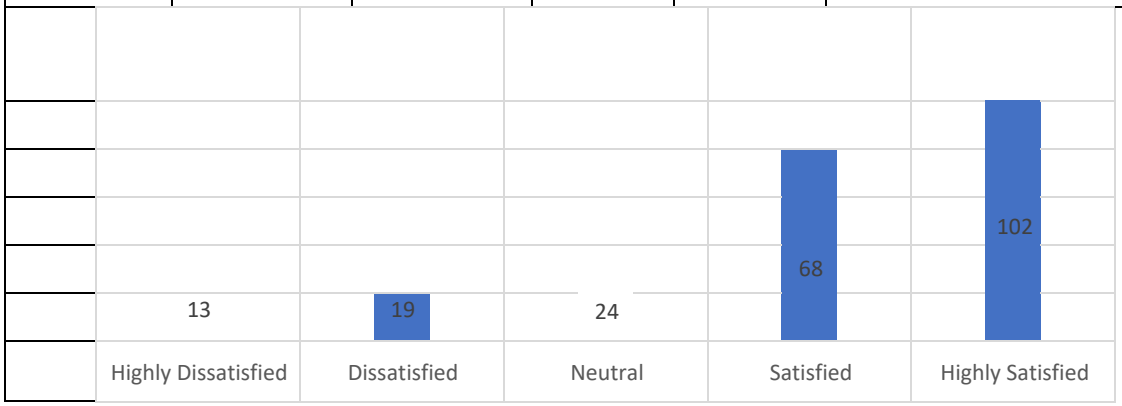


Table No. 11

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



Interpretation:

The survey sought the assess users's satisfaction with the Biomatric 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 Findingbindicate 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

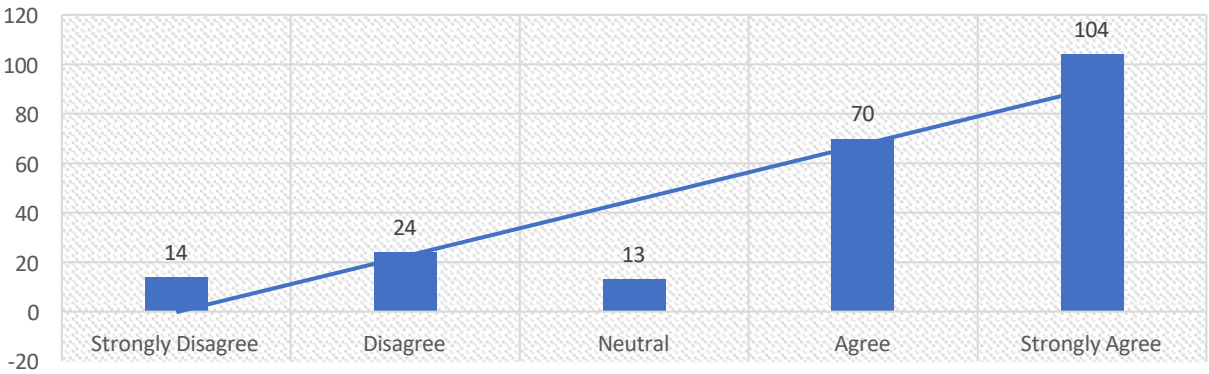
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with biometric technologies.On the contrary, only a small fraction exhibited dissatisfaction: 9.0% (n = 19) were dissatisfied, and 6.2% (n = 13) were highly dissatisfied.

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.

& LIMITATION

5.1 FINDINGS

- **AI Significantly Enhances Consumer Experience with Detection of Cybersecurity and Digital Fraud related**

  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

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sysenhance customer interaction with digital platforms.

- **AI-Based Fraud Detection Increases Technology enhancing the Consumer Trust for Adoption of Digital Payment Systems Globally**

  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.

- **Block chain & Fraud Detection Technology of AI Improves User Satisfaction**

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

- **AI based Biometric Authentication is Well Accepted by the Users**

  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 Between the Users for higher adoption of DPS**

  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.

- **Level of Consumer Awareness Still Needs Improvement with Various Activities**

  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.

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5.3 RECOMMANDATIONS

1.Launch AI-Based Consumer Awareness Campaigns Integrate Digital Literacy into Education Curriculum

2.Establish National Digital Payment Dispute Resolution Authorities:

3.Promote Real-Time AI-Based Fraud Detection Tools:

4.Encourage Use of Personalization and AI Chabot's:

5.4 LIMITATION

- 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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