

Original Research Article

Understanding the Role of Artificial Intelligence in Preventing Digital Payment Fraud: A Study of Consumer Awareness, Trust and Perceived Security in Mumbai Suburban Area

Komal Ravindra Pawar*Asst. Prof., Lords Universal College, Mumbai, Maharashtra, India**Corresponding author E-mail: komalsanskar26@gmail.com*

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Introduction:

Digital payments have become a part of everyday life, with UPI, mobile banking, cards, and digital wallets making transactions faster and easier. However, this growing digital use has also increased concerns about fraud, unauthorized transactions, phishing, identity theft, and other security risks.

As digital payments grow, the need for smarter fraud protection grows with them. Artificial Intelligence (AI) can help address these risks by studying transaction patterns, identifying unusual activities, and detecting possible fraud. Yet, the success of AI-based protection also depends on whether consumers understand and trust these systems.

Consumer awareness and trust can shape how safe people feel when using digital payments. When consumers understand the role of AI in fraud prevention and trust its security features, they may feel more confident about the safety of their transactions.

The present study focuses on consumers in the Mumbai Suburban Area and examines their awareness of AI-based fraud prevention, trust in digital payment systems, and perceived security. Based on data from 100 digital

payment users, the study examines the relationships between awareness and trust, trust and perceived security, and the perceived role of AI-based fraud prevention and perceived security.

The study seeks to provide useful insights for banks, financial institutions, and digital payment providers to strengthen fraud prevention and build greater consumer confidence in digital payment systems.

Review of Literature:

Dahiphale et al. (2024) examined the use of Artificial Intelligence in improving trust and safety in digital payment systems, with a focus on UPI and Google Pay. They developed an AI-based approach using Large Language Models to identify and classify possible scams in digital payment transactions. Their findings showed that AI can support fraud detection by improving the accuracy and consistency of scam identification. The study highlights the potential of AI-based technologies to make digital payment systems safer and reduce risks for users.

Nirmala and Banumathy (2026) examined the influence of Artificial Intelligence on consumer trust in digital payment systems in Chennai. The study focused on AI-enabled fraud detection, personalization, transaction speed, and service quality. Using data from 100 digital payment users, the researchers found that fraud detection had a significant positive effect on consumer trust. The study shows that AI-based security features can play an important role in building consumer confidence in digital payment platforms.

Sharma, Gupta, and Yadav (2026) examined the relationship between financial fraud perceptions, security awareness, perceived security, and trust in digital payment usage. Using data from 450 respondents in Delhi NCR, the study found that perceived security and trust play an important role in reducing concerns about fraud and strengthening confidence in digital payments. The study also showed that security awareness can influence digital payment use through trust and perceived security. These findings are closely related to the present study because they support the proposed relationship between consumer awareness, trust, and perceived security.

Srivastava and Sharma (2024) examined the relationship between customer trust, data privacy, and Artificial Intelligence in digital banking services. They focused on how AI-based security features, data protection, customer satisfaction, and AI quality influence customer trust. Using data from 206 respondents, the researchers applied Spearman's Rank Correlation to examine the relationships among the study variables. Their findings showed significant positive relationships between security features, AI quality, customer satisfaction, and customer trust. The study highlights that consumers are more likely to trust digital financial services when they perceive stronger security and reliable AI-based systems. These findings support the present study's focus on the relationship between AI-based fraud prevention, consumer trust, and perceived security.

Nandru et al. (2024) studied the factors influencing consumers' adoption of mobile payment services by extending the UTAUT2 model. The study included perceived trust and perceived security as important factors in understanding consumers' mobile payment behaviour. The researchers examined how these factors interact with other technology-related variables that influence users' willingness to adopt mobile payment services. Their work highlights the importance of trust and security perceptions in shaping consumer acceptance of digital payment technologies. The study is relevant to the present research because it provides support for examining the relationship between consumer trust and perceived security in digital payment systems.

Statement of the Problem:

Digital payments offer speed and convenience but also increase concerns about fraud, unauthorized transactions, phishing, and other security risks. Artificial Intelligence (AI) can help detect and prevent such fraud, but its effectiveness may depend on consumer awareness and trust. Although previous studies have examined AI-based fraud prevention, trust, and digital payment security, limited research has focused on their relationship among consumers in the Mumbai Suburban Area. Therefore, this study examines the relationship between AI-based fraud prevention, consumer awareness, consumer trust, and perceived security in digital payment systems.

Research Objectives:

1. To examine consumers' awareness of Artificial Intelligence-based fraud prevention in digital payment systems in Mumbai Suburban Area.
2. To examine the relationship between consumer awareness of Artificial Intelligence-based fraud prevention and consumer trust in digital payment systems in Mumbai Suburban Area.
3. To examine the relationship between consumer trust in Artificial Intelligence-based digital payment fraud prevention and consumers' perceived security of digital payment systems in Mumbai Suburban Area.

Research Hypotheses:**Hypothesis 1-**

H0: There is no significant relationship between consumer awareness of Artificial Intelligence-based fraud prevention and consumer trust in digital payment systems in Mumbai Suburban Area.

H1: There is a significant relationship between consumer awareness of Artificial Intelligence-based fraud prevention and consumer trust in digital payment systems in Mumbai Suburban Area.

Hypothesis 2-

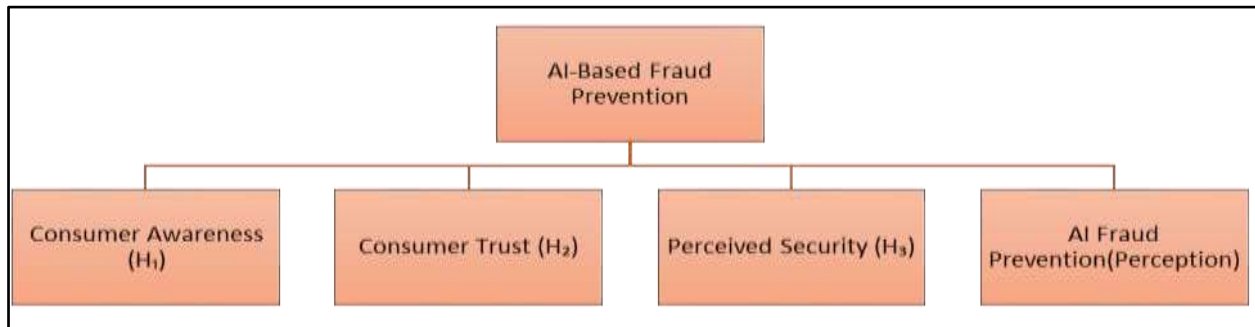
H0: There is no significant relationship between consumer trust in Artificial Intelligence-based digital payment fraud prevention and consumers' perceived security of digital payment systems in Mumbai Suburban Area.

H2: There is a significant relationship between consumer trust in Artificial Intelligence-based digital payment fraud prevention and consumers' perceived security of digital payment systems in Mumbai Suburban Area.

Hypothesis 3-

H0: There is no significant relationship between consumers' perception of Artificial Intelligence-based fraud prevention and their perceived security of digital payment systems in Mumbai Suburban Area.

H3: There is a significant relationship between consumers' perception of Artificial Intelligence-based fraud prevention and their perceived security of digital payment systems in Mumbai Suburban Area.

Conceptual Framework: (Proposed Relationship):**Research Methodology:**

The present study adopts a quantitative and descriptive research design to examine consumer awareness, trust, and perceived security regarding AI-based fraud prevention in digital payment systems. Primary data will be collected from digital payment users in the Mumbai Suburban Area through a structured questionnaire. The study will include a sample of 100 respondents, selected using convenience sampling with age-group quotas to ensure representation across different age categories. The collected data will be analyzed using appropriate statistical techniques, including descriptive statistics and Pearson's correlation analysis, to examine the proposed relationships between the study variables and test the hypotheses.

Significance of the Study:

The study is significant as it provides insight into how Artificial Intelligence (AI)-based fraud prevention may influence consumer awareness, trust, and perceived security in digital payment systems. The findings may help banks, financial institutions, and digital payment service providers understand consumer concerns and strengthen AI-based security measures. The study may also help consumers better understand the role of AI in protecting digital transactions and support future researchers in exploring AI, digital payment security, and consumer behaviour.

Scope of the Study:

The study focuses on digital payment users in the Mumbai Suburban Area and examines their awareness of AI-based fraud prevention, trust in digital payment systems, and perceived security. The study covers the relationships between consumer awareness and trust, consumer trust and perceived security, and the perceived role of AI-based fraud prevention and perceived security. Primary data will be collected from 100 respondents through a structured questionnaire using a quantitative research approach.

Limitations of the Study:

The study is limited to 100 digital payment users in the Mumbai Suburban Area, and therefore the findings may not represent consumers from other geographical areas or the entire population. The study uses convenience sampling with age-group quotas, which may limit the generalizability of the findings. The research is also based on respondents' self-reported awareness, trust, and perceptions, which may be influenced by individual experiences and understanding of AI-based fraud prevention. Additionally, the study focuses on selected variables and does not cover all factors that may influence digital payment security and fraud-related behaviour.

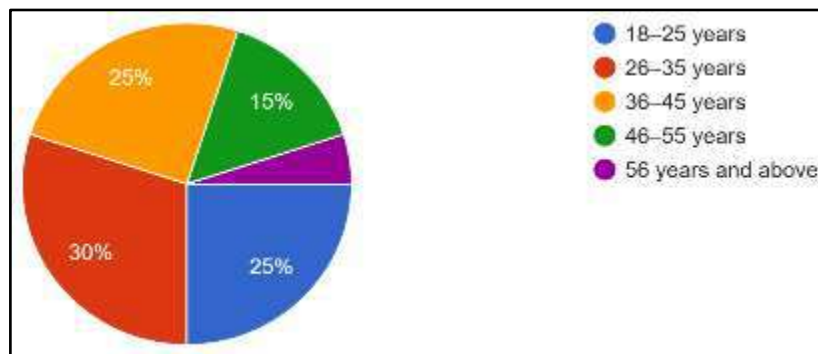
Research Gap:

The above studies show that AI can strengthen fraud detection and that trust, security awareness, and perceived security influence consumers' digital payment behaviour. However, there is still scope to examine these factors together from the consumer's perspective, particularly in the Mumbai Suburban Area. The present study addresses this gap by examining the relationship between awareness of AI-based fraud prevention and consumer trust, trust and perceived security, and the perceived role of AI-based fraud prevention and perceived security.

Data Analysis of the Study:

The data analysis of this study examines consumer awareness, trust, and perceived security regarding AI-based fraud prevention in digital payment systems in the Mumbai Suburban Area. It focuses on interpreting the responses of 100 respondents to understand their awareness of AI-based fraud detection, level of trust in AI-enabled security measures, and confidence in the safety of digital payment transactions. Following are the interpretation of the data with responses:

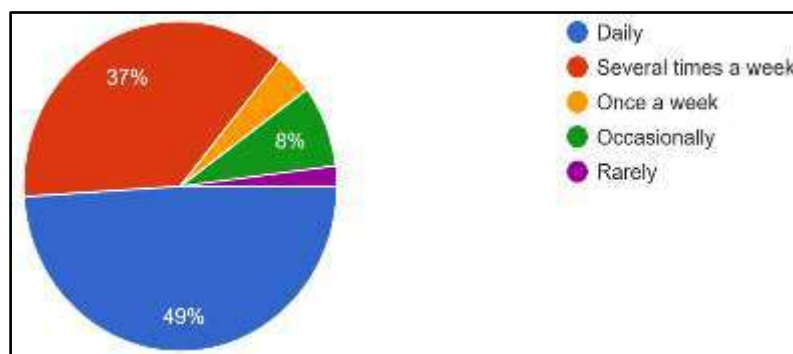
1. Age:



From the above chart and table, it can be observed that out of **100 respondents**, the majority, **30 respondents (30%)**, belong to the **26–35 age group**. This is followed by **25 respondents (25%)** each from the **18–25** and **36–45** age groups. Further, **15 respondents (15%)** are aged **46–55**, while **5 respondents (5%)** are **55 years and above**.

Since the majority of respondents are below 45 years, the findings primarily reflect the perceptions of young and middle-aged digital payment users.

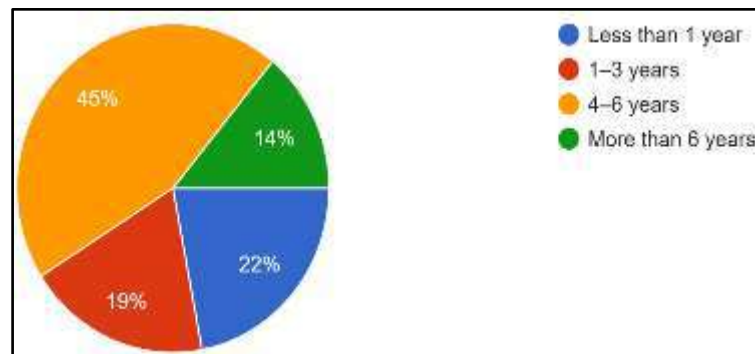
2. Frequency of Digital Payment Service Usage:



From the above chart and table, it can be observed that **49 respondents (49%)** use digital payment services **daily**, followed by **37 respondents (37%)** who use them **several times a week**. Further, **8 respondents (8%)** use digital payments occasionally, while **4 respondents (4%)** use them once a week and **2 respondents (2%)** rarely.

Since 86% of respondents use digital payments daily or several times a week, the findings strongly reflect the views of regular digital payment users.

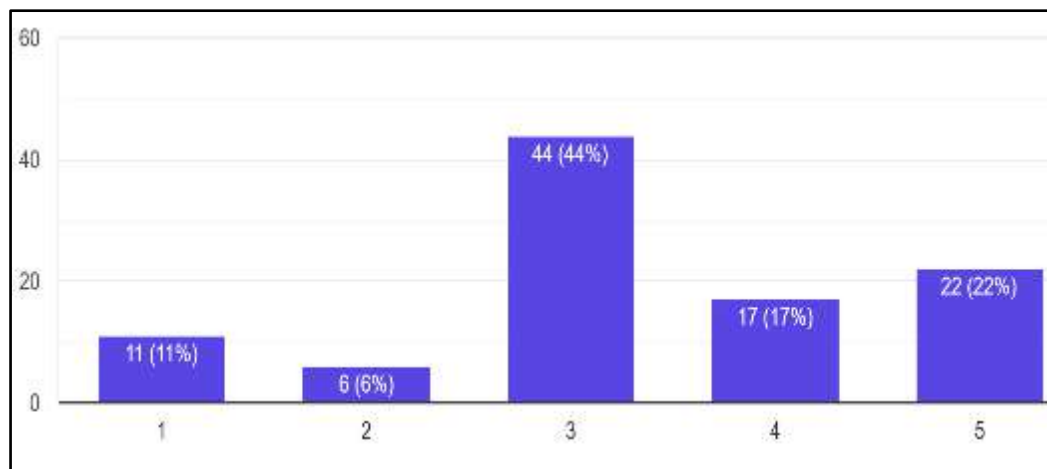
3. Duration of Using Digital Payment Services



From the above chart and table, it can be observed that **45 respondents (45%)** have been using digital payment services for **4-6 years**, followed by **22 respondents (22%)** for less than 1 year and **19 respondents (19%)** for 1-3 years. Further, **14 respondents (14%)** have been using digital payments for more than 6 years.

Since 59% of respondents have used digital payment services for 4 years or more, the findings largely reflect the views of experienced digital payment users.

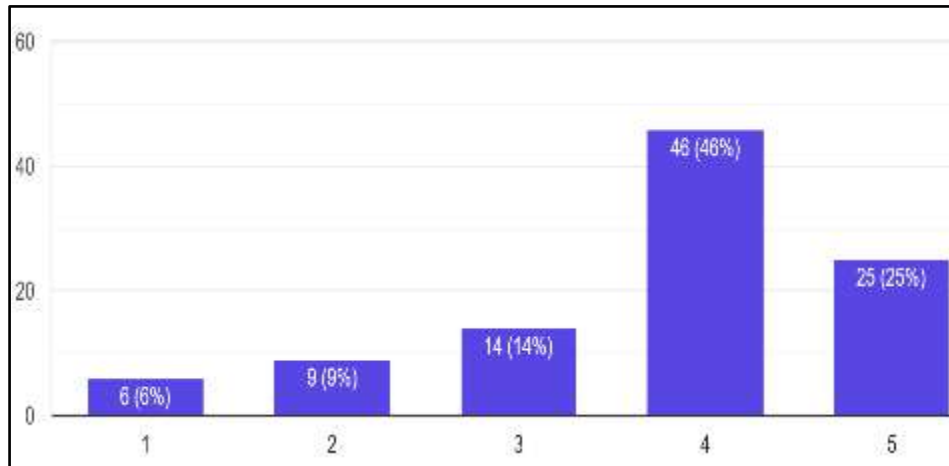
4. Awareness of AI-Based Fraud Prevention



From the above chart and table, it can be observed that **44 respondents (44%)** were **neutral** about their awareness of AI-based fraud prevention. Further, **22 respondents (22%)** strongly agreed and **17 respondents (17%)** agreed, while **11 respondents (11%)** strongly disagreed and **6 respondents (6%)** disagreed.

Overall, 39% of respondents show awareness, while the high neutral response (44%) indicates a need for greater consumer awareness of AI-based fraud prevention.

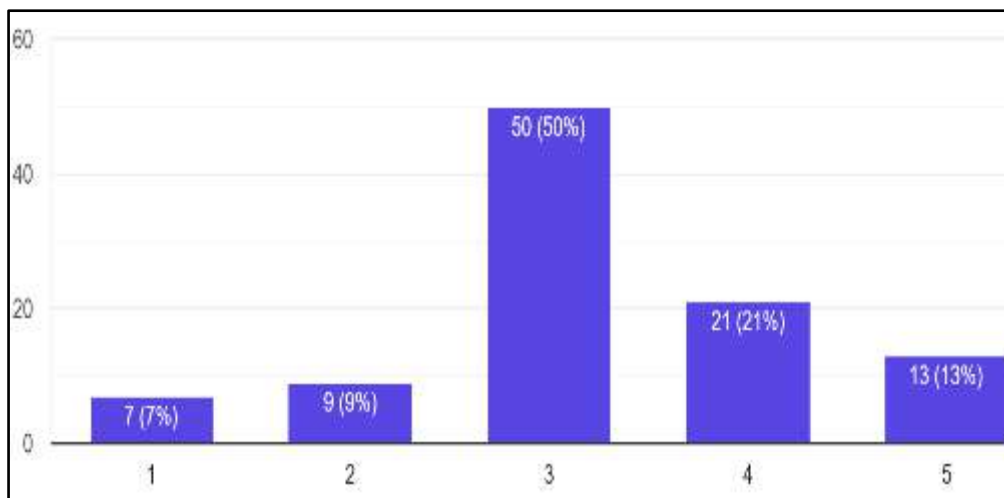
5. Understanding of AI in Identifying Suspicious Transactions



From the above chart and table, it can be observed that **46 respondents (46%)** agreed that AI can identify unusual or suspicious digital payment transactions, followed by **25 respondents (25%)** who strongly agreed. Further, **14 respondents (14%)** remained neutral, while **9 respondents (9%)** disagreed and **6 respondents (6%)** strongly disagreed.

Overall, 71% of respondents understand AI's role in identifying suspicious transactions, indicating a strong level of awareness.

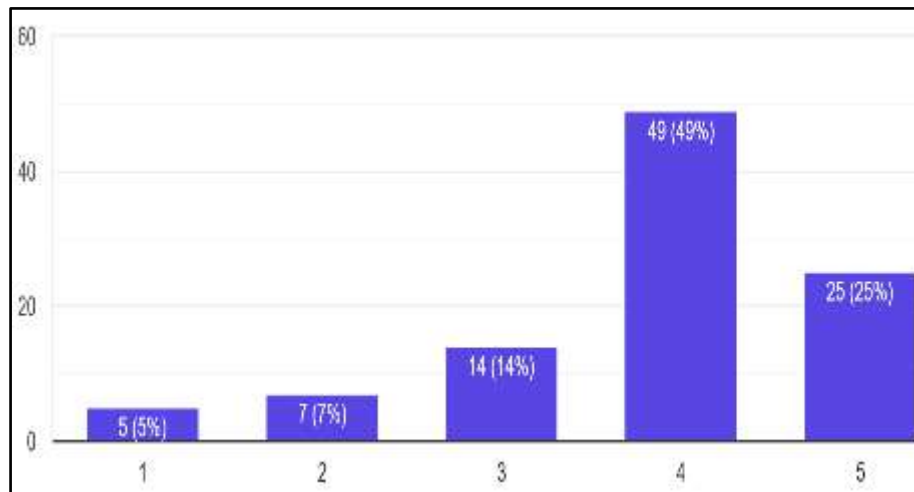
6. Trust in AI-Based Fraud Prevention Systems



From the above chart and table, it can be observed that **50 respondents (50%)** remained **neutral** about trusting AI-based fraud prevention systems, while **21 respondents (21%)** agreed and **13 respondents (13%)** strongly agreed. Further, **9 respondents (9%)** disagreed and **7 respondents (7%)** strongly disagreed.

Overall, 34% of respondents expressed trust, while the high neutral response (50%) indicates scope for building greater consumer confidence in AI-based fraud prevention.

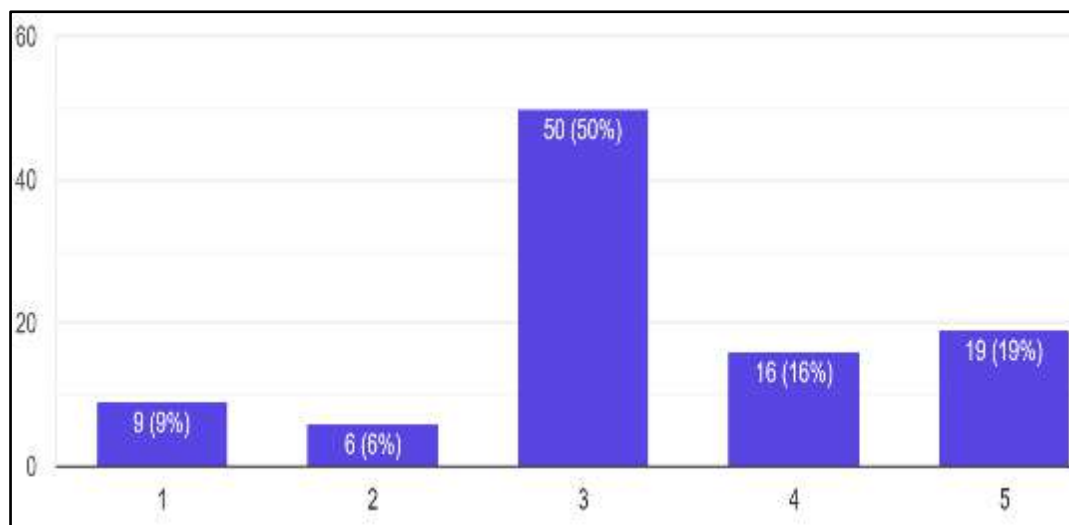
7. Impact of AI-Based Fraud Prevention on Consumer Trust



From the above chart and table, it can be observed that **49 respondents (49%)** agreed that AI-based fraud prevention increases their trust in digital payment systems, followed by **25 respondents (25%)** who strongly agreed. Further, **14 respondents (14%)** remained neutral, while **7 respondents (7%)** disagreed and **5 respondents (5%)** strongly disagreed.

Overall, 74% of respondents believe that AI-based fraud prevention enhances their trust in digital payment systems.

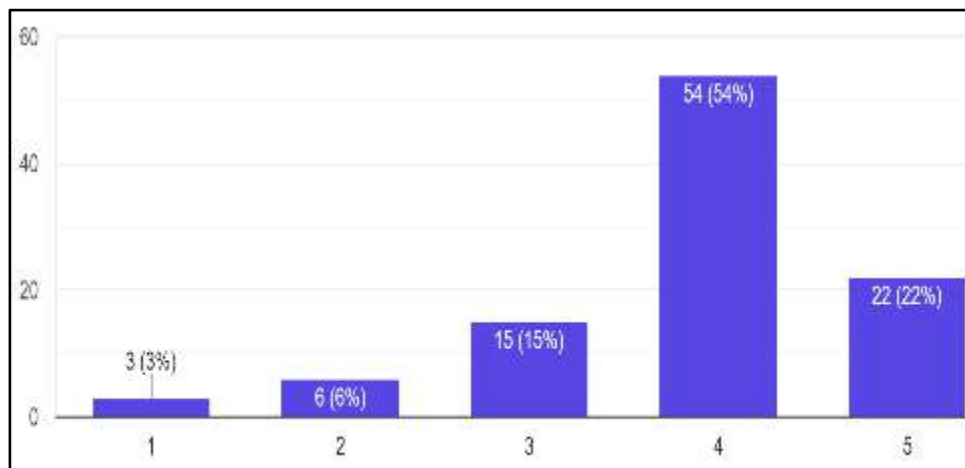
8. Perceived Security of AI-Based Fraud Prevention



From the above chart and table, it can be observed that **50 respondents (50%)** remained neutral about whether AI-based fraud prevention makes digital payment transactions more secure. Further, **19 respondents (19%)** strongly agreed and **16 respondents (16%)** agreed, while **6 respondents (6%)** disagreed and **9 respondents (9%)** strongly disagreed.

Overall, 35% of respondents perceive AI-based fraud prevention as enhancing transaction security, while the high neutral response indicates scope for improving consumer confidence.

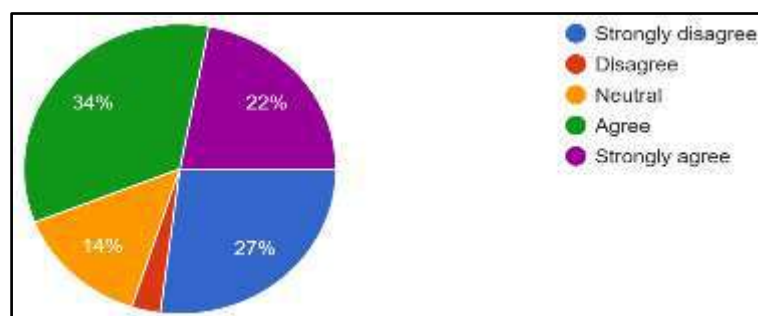
9. Confidence in Digital Payments with AI-Based Fraud Prevention



From the above chart and table, it can be observed that **54 respondents (54%)** agreed that they feel confident using digital payment services when AI-based fraud prevention is in place, followed by **22 respondents (22%)** who strongly agreed. Further, **15 respondents (15%)** remained neutral, while **6 respondents (6%)** disagreed and **3 respondents (3%)** strongly disagreed.

Overall, 76% of respondents feel confident using digital payments when AI-based fraud prevention is in place, indicating strong perceived security and confidence.

10. Perceived Effectiveness of AI-Based Fraud Prevention



From the above chart and table, it can be observed that **34 respondents (34%)** agreed and **22 respondents (22%)** strongly agreed that effective AI-based fraud prevention can reduce digital payment fraud and improve consumer security. Further, **14 respondents (14%)** remained neutral, while **3 respondents (3%)** disagreed and **27 respondents (27%)** strongly disagreed.

Overall, 56% of respondents recognize the potential of AI-based fraud prevention to improve consumer security.

Significant Findings of the Study:

- The findings show that **consumers have a fair level of awareness about AI-based fraud prevention**, particularly its ability to identify unusual or suspicious digital payment transactions.
- The study indicates that **awareness of AI-based fraud prevention contributes to consumer trust**, as many respondents feel that the use of AI increases their confidence in digital payment systems.
- The responses suggest that **consumer trust and perceived security are closely connected**, with respondents who trust AI-based protection generally feeling more secure while making digital payments.

- The findings also reveal that **AI-based fraud prevention improves consumers' confidence in using digital payment services**, with a majority feeling more confident when such security measures are in place.
- Overall, the responses indicate that **AI has an important role in making digital payments safer and more trustworthy**, although the high number of neutral responses in some areas shows the need for greater consumer awareness and understanding of AI-based security measures.

Conclusion:

The study concludes that **Artificial Intelligence plays an important role in strengthening the safety, trust, and perceived security of digital payment systems in the Mumbai Suburban Area**. The findings from 100 respondents indicate that consumers have a reasonable awareness of AI-based fraud prevention and recognize its ability to identify suspicious transactions and reduce fraud risks. The responses also suggest that **awareness of AI-based fraud prevention is associated with consumer trust**, while trust in AI-enabled fraud prevention contributes to a stronger perception of digital payment security. Further, consumers generally feel more confident using digital payment services when AI-based security measures are in place. Overall, the study highlights that effective implementation and greater consumer awareness of AI-based fraud prevention can enhance **trust, perceived security, and confidence in digital payments**, thereby supporting safer adoption of digital payment services.

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