



The Role of Blockchain in Strengthening Digital Transaction Security.

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Abstract: The rapid growing of digital transaction in retail sectors has all concern over security, transparency and trust. Current digital payment systems face persistent threats such as fraud, data branching and cyberattacks are all highlighting the need for innovative security framework. In this study examining the potential of blockchain technology to strengthen digital transaction security in retail industry. Blockchain core function like decentralization, immutability and cryptographic verification are explore mechanisms to enhance data integrity, prevent unauthorized and ensure transparency in payment processes. The adoption of blockchain significantly strengthen transaction security if implementing with strategic planning and integration into existing system. It contributes to bridging the gap between theoretical benefits and practical real word applications offering recommendations for a blockchain enabled, consumer trusted and regulation complaint payment infrastructure. The study concludes the widespread adoption of blockchain it coupled with supportive legal and technological framework could set a new benchmark for secure and reliable digital transactions in the future.

Keywords: - blockchain technology, digital security, cybersecurity, decentralization, immutability, cryptographic verification, fraud prevention, transparency.

1.Introduction

Know a day's online transaction volume is increasing at a never-before-seen before. The need for safe and reliable digital transaction systems has never been greater from data sharing and digital contracts to financial transfers and e-commerce purchases. The dependability of conventional digital security frameworks is called into question by the rise in fraud, data breaches and cyberthreats that accompany this expansion.

The Blockchain is providing a decentralized, transparent and specially designed system for recording and verifying transactions blockchain technology has emerged as a promising solution to these issues. By doing away with the need for centralized intermediaries and utilizing cryptographic techniques, blockchain improves data integrity, fosters trust and drastically lowers the risk of unauthorized access or manipulation.

The study focused how blockchain technology can improve the security of online transactions. It seeks to understand how the fundamental characteristics of blockchain decentralization, immutability and smart contracts help to create a more secure online environment. The study also looks at practical issues on uses related to implementing blockchain technology to protect online transactions.

2.Literature Review

In the retail industry security in online transactions has become a critical concern for business and customers. As financial transaction increasingly shifts to digital platform like ensuring data integrity, privacy and protection against fraud has become more important than ever. Blockchain technology has emerged as a powerful tool in identifying these challenges by offering a transparent, secure and unforgeable system for recording transaction. Unexpected traditional system. Blockchain relies on decentralized networks and like cryptographic techniques for it making it high resistant to unauthorized aces and manipulation of transaction data. **Murod, M., Anhar, S., Andayani, D., Fitriani, A., & Khanna, G. (2025):** The findings of the research have significant importance for decision-makers, offering insightful information on how blockchain technology might be applied to improve IP management and protection procedures. This study emphasizes the necessity of developing blockchain-based solutions further to ease IP management by providing a framework that is more efficient, transparent, and secure.

Warveen Merza Eido (2025): Block chain technology it providing innovation way to improving digital transaction security and trust. Blockchain technology providing loyalty programs to increases customer retention its maximalize operational efficiency and decision making.

Raj Mohankumar (2025): Blockchain technology was created by the study that explains the quick growth of digital infrastructure. To improve the security of these technologies, sophisticated cryptographic techniques as well as threat mitigation strategies were implemented. The study offers suggestions for protecting these ecosystems from online attacks.

Albshaier, L., Almarri, S., & Hafizur Rahman, M. M. (2024): The blockchain technology use in the online retail sector. Blockchain technology stores transactions and related data, making identifying fraud and investigation easier. By generating a thorough record of every relevant information, blockchain technology makes transaction tracking possible and can help detect and stop fraud in future generations.

2.2 Research Gap

Even though blockchain technology is becoming more popular as a way to improve cybersecurity, there are still a number of important research gaps. The majority of current research concentrates on the theoretical advantages of blockchain, such as immutability, decentralization and transparency, but it does not thoroughly examine how it is actually being used in particular sectors, such as digital financial services or retail. Although blockchain provides strong data protection there is not enough research done on the issues of scalability, real-time processing and system performance in high-volume digital environments.

2.3 Need of the Study

In this digital era electronic retail business transactions for efficiency and growth. It including large volume of digital transactions daily it including customer purchase, inventory management, supplier payment and company internal accounting. This growing dependence comes the rising threat of data breaches, financial fraud and cyber-attacks which compromise customer trust and operational interactions. This study explains how blockchain can be integrated into retail business. Digital infrastructure, assess its effectiveness in safeguarding transactions and understanding present transactions involved challenges.

3.Objective of the Study

1. To better understanding the fundamental of blockchain technology and its core security features relevant to financial transactions.
2. To analyze the potential of blockchain technology enhancing security in digital transaction.

3.1 RESEARCH METHODOLOGY

Descriptive research method: To exploring and analysing the role of blockchain technology in strengthening digital transactions in improving the transparency, security and efficiency in digital transactions at retail business. Particularly focuses on digital payment.

4. Limitation of the Study

- The research study is conducted within a particular period time frame 6 weeks.
- This sample size maximum 200 respondents may not be large enough.
- Limited Time constraints may not ability to observe long-term impacts in business.

5.Data Analysis and Interpretation

5.1 Gender.

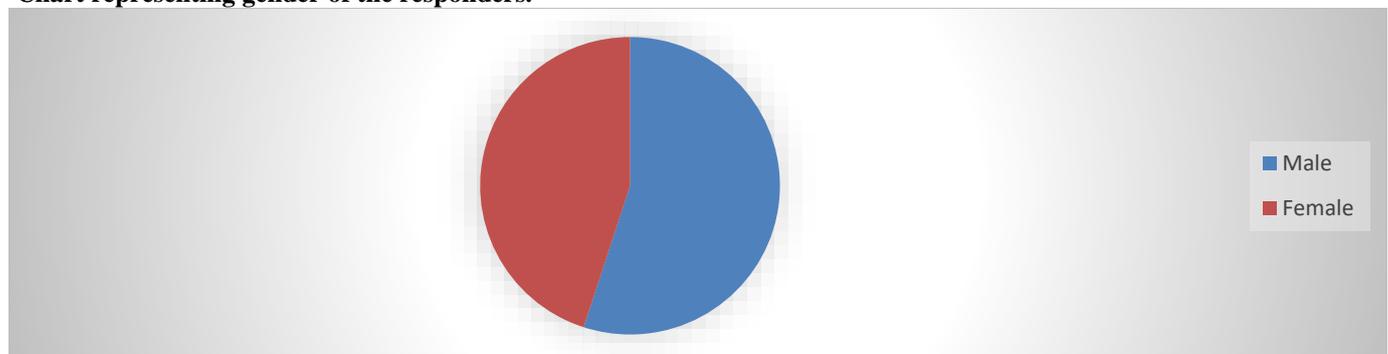
Table No: -1 Table representing gender of the responders.

Scale	Number of responses	Percentage
Male	110	55%
Female	90	45%
Total	200	100%

Analysis:

According to the table data above, 55% of respondents are men and 45% of respondents are women. According to the above table, men are more likely than women to respond.

Chart representing gender of the responders.



Interpretation:

The above chart show that majority of Responders are male comparing to female in this survey data. The high male respondent reflects the general shopping behaviour for electronic and appliances in this survey. The balancing of respondents helps to more representative about digital payment habits and satisfaction of blockchain technology for strengthen of digital transaction.

5.2. Age Group

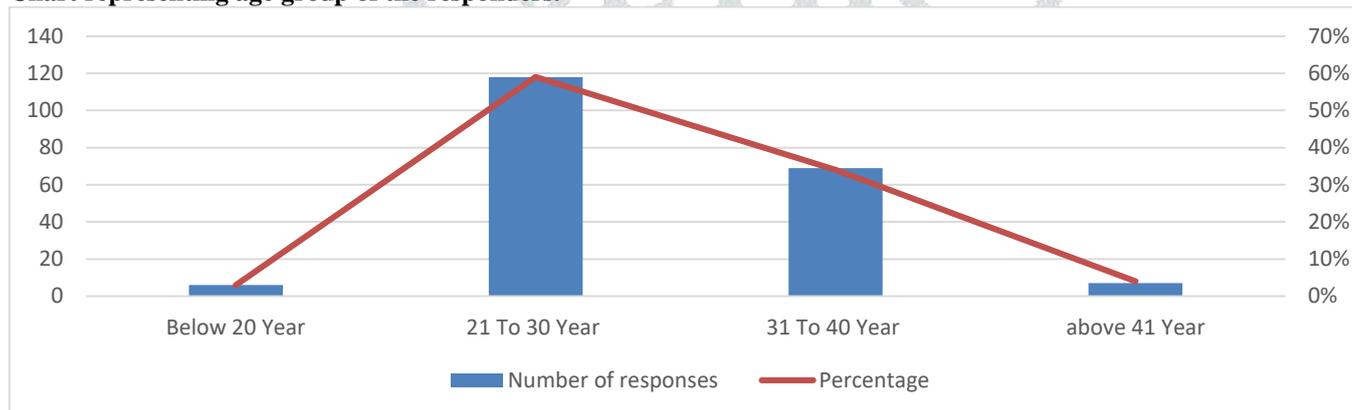
Table No: - 2 Table representing age group of the responders.

Scale	Number of responses	Percentage
Below 20 Year	6	3%
21 To 30 Year	118	59%
31 To 40 Year	69	34%
above 41 Year	7	4%
Total	200	100%

Analysis:

The above table indicates that below 20 years of respondents are 3%, 21 to 30 years respondents are 59%, 31 to 40 years respondents are 34% and only 4% respondents are above 41 years in this statement.

Chart representing age group of the responders.



Interpretation:

Above chart calculation show that most of responders between the age group 21 to 30 Year Young respondents are more and least number of responders are age between below 20 year and above 40 years comparing to young generation in this statement. The need of digital payment enhancement primary toward 21 to 30 age group typically comfortable with digital technology and highly active in online transactions.

5.3. Blockchain method you prefer additional security measures verification while making digital transaction.

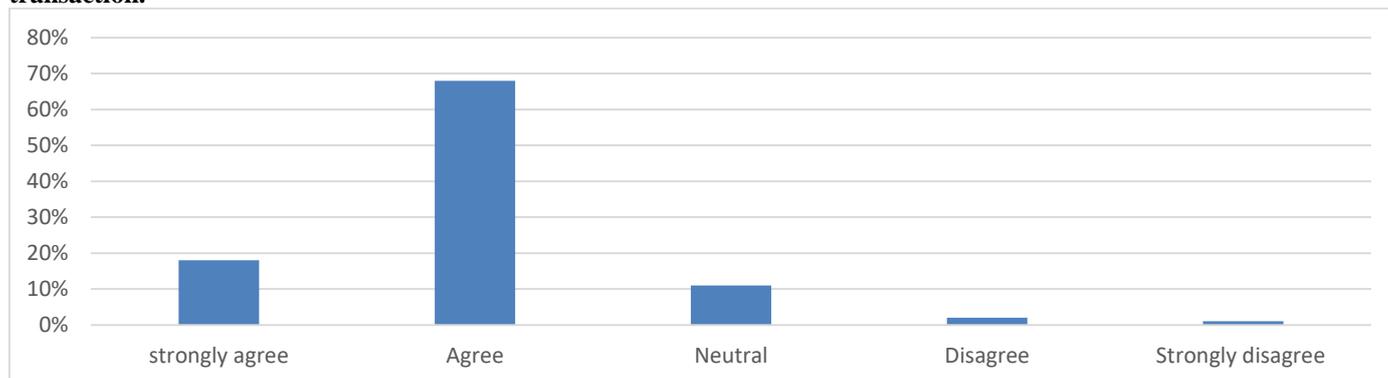
Table No-3: Table representing Blockchain method you prefer additional security measures verification while making digital transaction.

Scale	Number of responses	Percentage
Strongly agree	37	19%
Agree	137	68%
Neutral	22	11%
Disagree	4	2%
Strongly disagree	0	0%
Total	200	100%

Analysis:

The Table indicate that 68% of the respondents saying agree, 19% of the respondents saying strongly agree, 11% respondents are neutral and only 2% of the respondents are disagree and no one will say strongly disagree in this table.

Chart representing Blockchain method you prefer additional security measures verification while making digital transaction.



Interpretation:

The majority of the respondents are agreed and strongly agree the statement it providing high level trust and acceptance in blockchain technology as an additional layer of security in digital payment method system and it help to growing awareness and demand for advance security. Neutral respondent may indicate either a lack of understanding of blockchain features towards enhanced verification and respondents recognized that blockchain can add value in protecting transaction integrity, data privacy

and reducing fraud. This results reflection growing awareness and positive perception of blockchain technology as a trust tool in digital payment.

5.4 Using blockchain technology to protect your digital transaction for increasing customer trust in the making payment.

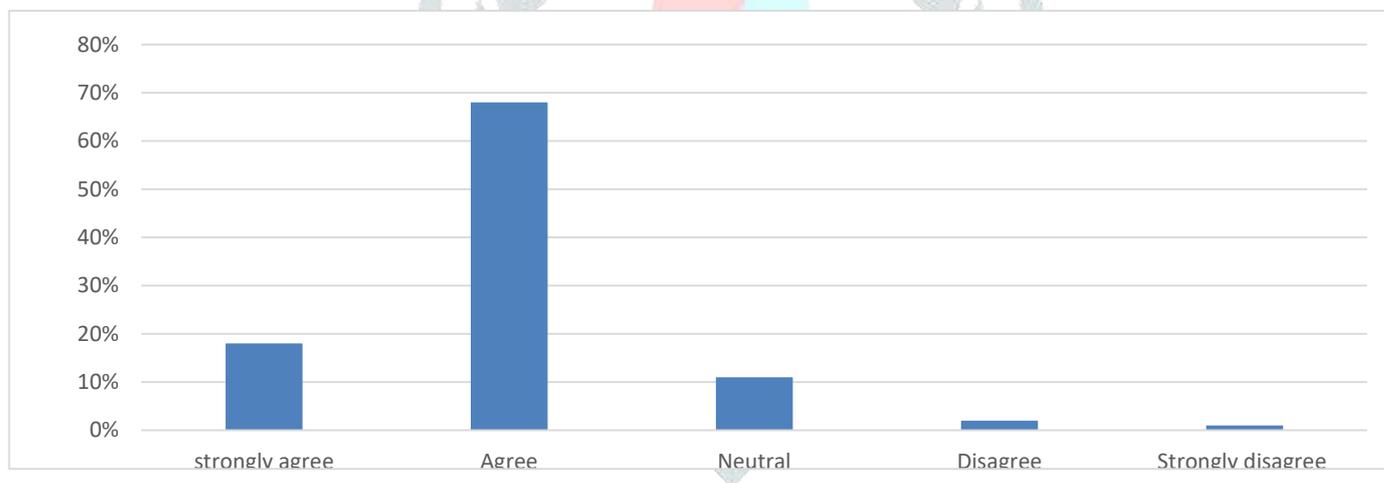
Table No-4: Table representing blockchain technology to protect your digital transaction for increasing customer trust in the making payment.

Scale	Number of responses	Percentage
Strongly agree	34	17%
Agree	131	65%
Neutral	32	16%
Disagree	2	2%
Strongly disagree	1	1%
Total	200	100%

Analysis:

According to the table, 65% of respondents agree, 17% strongly agree, 16% are neutral, and only 2% and 1% disagree and strongly disagree, respectively.

Chart representing blockchain technology to protect your digital transaction for increasing customer trust in the making payment.



Interpretation:

The respondents are majority agreed and strongly agree that blockchain technology can enhance the security of digital transaction also increasing trust and they have high level of confident in the technology potential boost payment trust. Some people showing some level of awareness of blockchain impact. Neutral responded indicating uncertainty or lack of familiarity with blockchain role in digital trust. The origination can gain competitive advantage by integrating blockchain based transactions system that enhancing customer trust.

5.5 Opinion on Blockchain technology can help to prevent fraud in transaction.

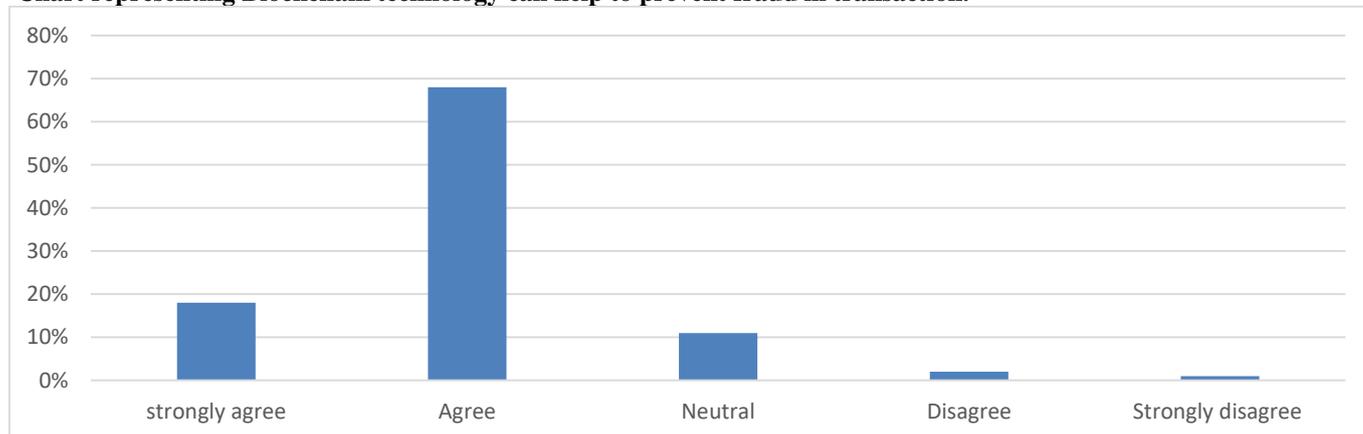
Table No-5: Table representing Blockchain technology can help to prevent fraud in transaction.

Scale	Number of responses	Percentage
strongly agree	26	13%
Agree	134	67%
Neutral	36	18%
Disagree	3	2%
Strongly disagree	1	1%
Total	200	100%

Analysis:

The Table indicate that 67% of the respondents are agree, 13% of the respondents are strongly agree, 18% respondents are neutral and only 2% and 1% of the respondents are disagree and strongly disagree in this table.

Chart representing Blockchain technology can help to prevent fraud in transaction.



Interpretation:

The data show that majority of the responders are confident that blockchain technology can help to prevent fraud in transaction, respondents are support blockchain in financial and retail platforms and remain responders’ opinion they need more inform users about how blockchain. Disagree respondents not believing in blockchain effectiveness in fraud protection. Neutral respondent possibly due to limited understanding of blockchain capability, technology benefits from leveraging blockchain to reducing fraud risks and improve in transparency in digital transaction.

5.6 Data immutability (once recorded and cannot be altered) feature of blockchain do you agree would help improving security.

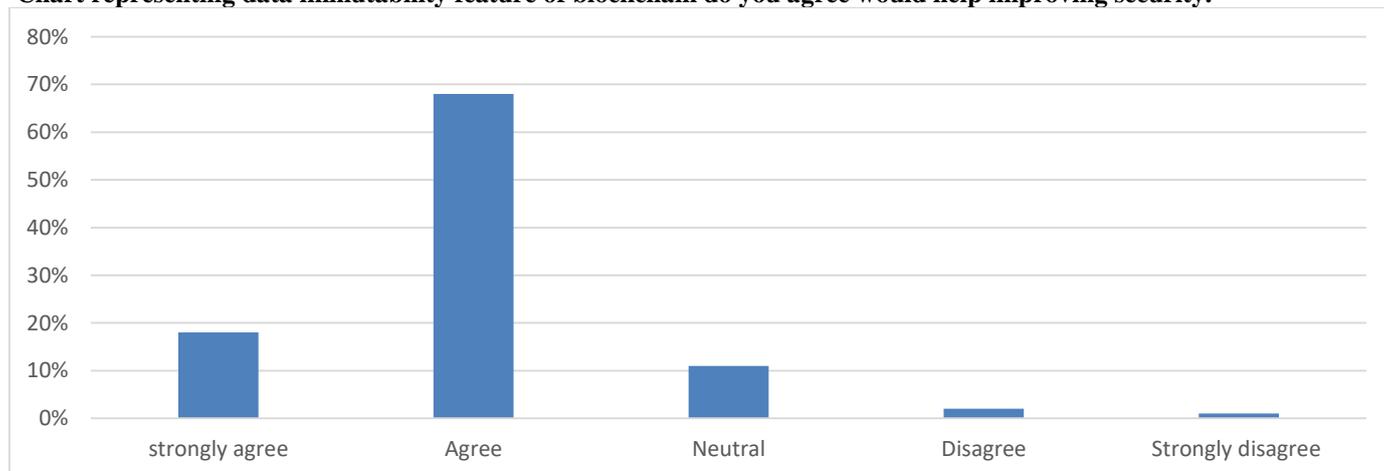
Table No-6: Table representing data immutability feature of blockchain do you agree would help improving security.

Scale	Number of responses	Percentage
strongly agree	36	18%
Agree	134	67%
Neutral	25	12%
Disagree	4	2%
Strongly disagree	1	1%
Total	200	100%

Analysis:

The Table indicate that 67% of the respondents are agree, 18% of the respondents are strongly agree, 12% respondents are neutral and only 2% and 1% of the respondents are disagree and strongly disagree in this table.

Chart representing data immutability feature of blockchain do you agree would help improving security.



Interpretation:

The finding indicate tara majority of responders are agree and recognize the value of blockchain immutability in enhancing security and immutability ensure that transaction records cannot be tampered with making system transparent and resistant to fraud. Blockchain is a secure technology of financial transaction. Neutral respondent indicates some lack of awareness of understanding of how immutability contributes to security. Adopting blockchain can providing great integrity in transaction records and building strong trust among customer.

5.7 Using of advanced security technologies like blockchain can increase you trust in digital transaction system.

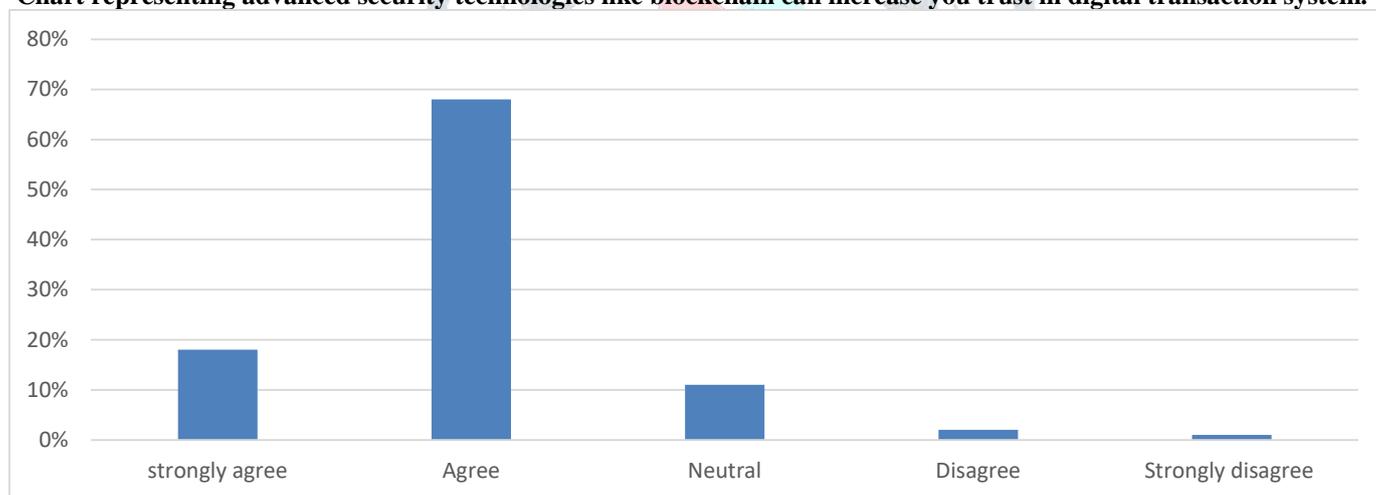
Table No-7: Table representing advanced security technologies like blockchain can increase you trust in digital transaction system.

Scale	Number of responses	Percentage
Strongly agree	30	15%
Agree	138	69%
Neutral	26	13%
Disagree	5	2%
Strongly disagree	1	1%
Total	200	100%

Analysis:

The Table indicate that 69% of the respondents are agree, 15% of the respondents are strongly agree, 13% respondents are neutral and only 2% and 1% of the respondents are disagree and strongly disagree in this table.

Chart representing advanced security technologies like blockchain can increase you trust in digital transaction system.



Interpretation:

The finding shows that strong positive perception of blockchain security technology in enhancing trust with in digital transaction system. Most of the agree respondents trust in critical components in any digital platform. Respondents like to engage in digital payments strongly security mechanisms are in place. Less respondent doubts about the effectiveness of blockchain and smiler technology in building trust. Its incorporating blockchain can not only enhance security but also significantly boost respondent confident and satisfaction which is essential in today digital economy.

5.8 Two factors authentication and end to end encryption security feature you prefer to make more comfortable with digital transactions.

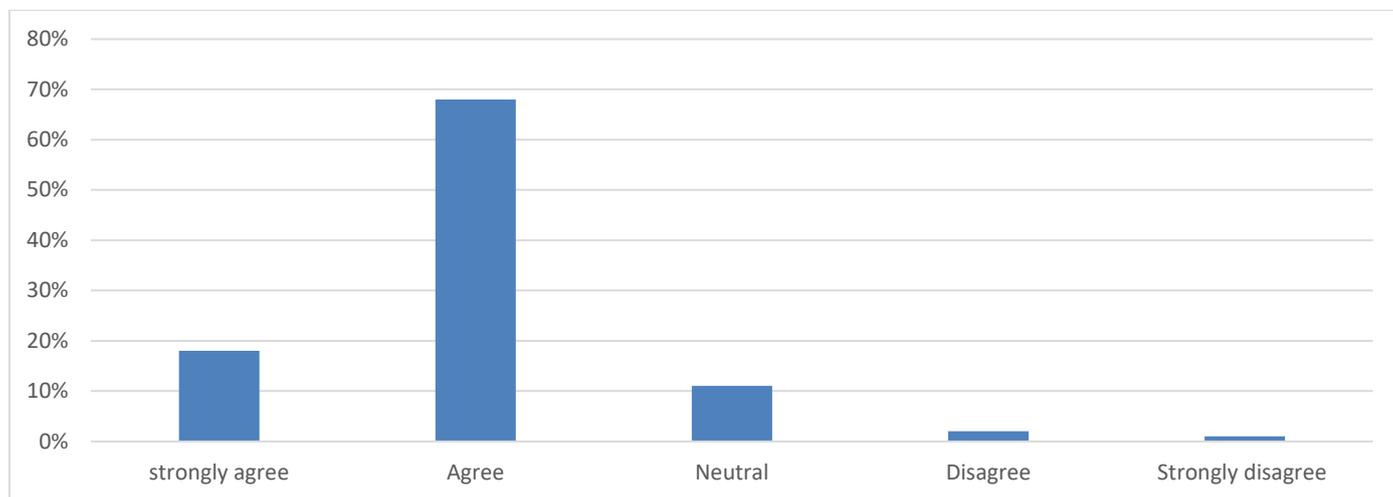
Table No-8: Table representing Two factors authentication and end to end encryption security feature you prefer to make more comfortable with digital transactions.

Scale	Number of responses	Percentage
Strongly agree	36	18%
Agree	136	68%
Neutral	22	11%
Disagree	4	2%
Strongly disagree	2	1%
Total	200	100%

Analysis:

The Table indicate majority 68% respondent agree, 18% of the respondents are strongly agree, 11% respondents are neutral and only 2% and 1% of the respondents are disagree and strongly disagree in this table.

Chart representing Two factors authentication and end to end encryption security feature you prefer to make more comfortable with digital transactions.



Interpretation:

The results show that the majority of respondents prefer and trust advanced security mechanisms like two factor authentication and end to end encryption in digital transaction. The advance features enhancing user comfort and against unauthorized access in digital transaction and building confident in digital finance system for business it integrating such security proto call alongside technology can strength blockchain feature further strengthen digital transaction experience reduce fraud and risk to increase customer loyalty and for more security features.

5.9 lack of understanding is main concerns regarding blockchain technology.

Table No-9: Table representing lack of understanding is main concerns regarding blockchain technology.

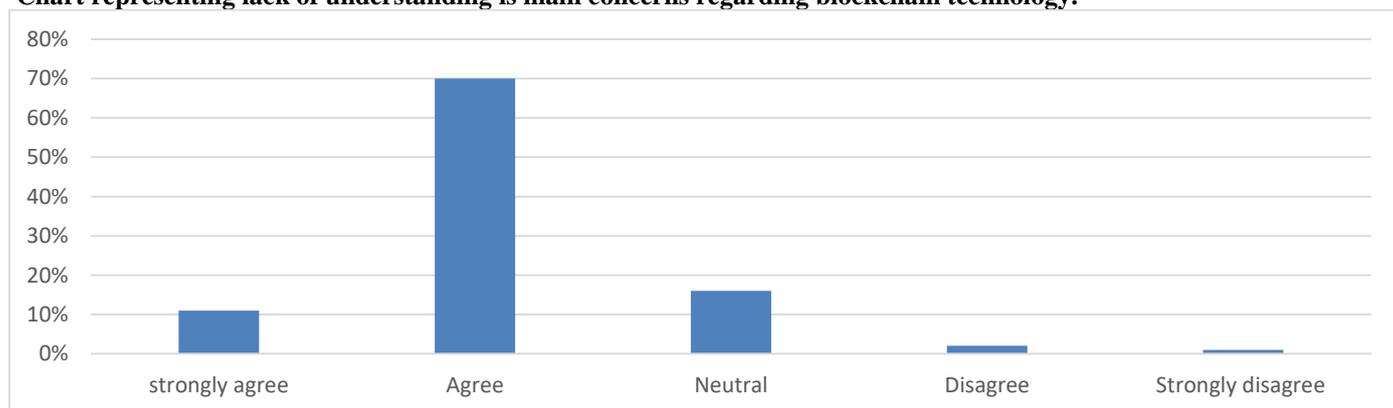
Scale	Number of responses	Percentage
Strongly agree	23	11%
Agree	140	70%
Neutral	31	16%
Disagree	4	2%
Strongly disagree	2	1%
Total	200	100%

Source: Google firm.

Analysis:

The Table indicate that 70% of the respondents are agree, 11% of the respondents are strongly agree, 16% respondents are neutral and only 2% and 1% of the respondents are disagree and strongly disagree in this table.

Chart representing lack of understanding is main concerns regarding blockchain technology.



Interpretation:

This data indicates that a majority of respondents see lack of understanding as a key barrier to the adoption of blockchain technology. Many respondents support that use of blockchain for security and trust it recognize tata limited public awareness and technology knowledge may slow down adoption. The data emphasizes the need of education, awareness campaigns and user-friendly interface to demystify blockchain and encourage its adoption it addressing knowledge gap could lead to grate trust adoption and satisfaction knowledge may show down adoption of digital transaction powered by blockchain.

6. Findings

- Blockchain adoption support, agree that implementation blockchain would increasing trust in digital transaction.
- Increasing demand for data privacy agree that data privacy is a significant concern during digital transaction.
- Boosting advanced security measurement for additional verification through blockchain during transaction.

- Two factor authentication and encryption preferring help in security features for comfortable usage of digital payment.
- Efficiency appreciation and speed agree blockchain improving transaction processing speed.
- Real time record keeping supports blockchain real-time tamper-proof records.
- Blockchain technology help to prevent fraudulent transaction.
- Lack of technology awareness still major barriers to adoption of blockchain technology in retails.

7. Suggestions

- Blockchain integrate gradually in backend systems for transparency and fraud detection.
- Focus on user friendly blockchain interfaces for better customer adoption and user-friendly users.
- Enhancing data protection laws aligned with blockchain for long-term taking action for removing customer doubts or fears.
- Partnership with Fintech firms to enabling blockchain powered securities for digital payments getaways
- Using real time alerts for avoiding data errors and it helps to build trust implementing real time alerts in blockchain enable transaction.
- Two factor authentication it protecting our data while making payment it helps to retailer and customer
- Using blockchain in payment method, retailer or customer is not able to changing recorded data.
- It helps to improving transparency of transaction with customer and dealers it maintains trust and visible blockchain records.

Conclusion

The overall results of the research clearly show that fundamental characteristics of immutability, decentralization, real-time processing and transparency blockchain technology is seen as a trustworthy remedy for these issues. Respondents' preferences for extra security features like encryption and two-factor authentication have also clearly changed. The great majority of purchasers are confident and happy with the digital payment options available today including UPI and debit/credit cards. These systems are convenient, safe and easy to use according to the majority of respondents. This illustrates how digital payments have been successfully embraced in India, especially by the country's younger urban population.

The blockchain technology has the potential to transform the security of digital transactions in the retail sector. While consumers have trust in existing systems, they want stronger and more transparent security—areas in which blockchain might be revolutionary. However, user education, strategic communication and ease of adoption are just as important to the implementation's success as technological integration. Retail business may establish themselves as leaders in safe and client-focused online shopping by taking care of these issues.

Reference

- Murod, M., Anhar, S., Andayani, D., Fitriani, A., & Khanna, G. (2025). Blockchain Based Intellectual Property Management Enhancing Security and Transparency in Digital Entrepreneurship. *Aptisi Transactions on Technopreneurship (ATT)*, 7(1), 240–251.
- eido, W. M. (2025). Warveen Merza Eido, Subhi Zeebaree. A Review of Blockchain Technology In E-business: Trust, Transparency, and Security in Digital Marketing through Decentralized Solutions. 18(3), 411-433.
- Raj Mohankumar. (2025). Enhancing Blockchain, Internet of Things, and Cloud Security Through Advanced Cryptographic Techniques and Threat Mitigation Strategies. *International Journal of Advanced Research in Cyber Security*, 6(2), 7-14.
- Albshaier, L., Almarri, S., & Hafizur Rahman, M. M. (2024). A review of blockchain's role in E-Commerce transactions: Open challenges, and future research directions. *Computers*, 13(1), 27.