

Assessing The Current State of Blockchain Technology Adoption in Financial Transactions: An Empirical Study of Organizational Implementation and Perceptions in India

Teena Parihar¹, Dr Payal Khandelwal²

¹Research Scholar, JRN Rajasthan Vidyapeeth University, Udaipur

²Assistant Professor, JRN Rajasthan Vidyapeeth University, Udaipur

Abstract—Blockchain technology has emerged as one of the most transformative innovations in the financial sector, offering enhanced transparency, security, efficiency, and decentralization in financial transactions. The present study examines the current state of blockchain technology adoption in financial transactions by analyzing organizational implementation patterns and perceptions within the Indian financial sector. The study is based on primary data collected from 500 respondents representing various organizations engaged in financial operations and technology-enabled services. Descriptive statistics, frequency analysis, Chi-square tests, and ANOVA were employed to analyze the data. The findings reveal significant differences in the adoption of advanced financial technologies among organizations. While 43.0% of respondents reported that their organizations currently utilize blockchain technology in financial transactions, a substantial proportion either do not use it or are still planning implementation. Payments and settlements emerged as the most prominent application area, followed by asset management and trade finance. The results further indicate mixed perceptions regarding the level of blockchain adoption in India, reflecting both opportunities and challenges in its widespread implementation. The study concludes that blockchain technology is gradually gaining acceptance in the Indian financial ecosystem; however, regulatory uncertainty, technological readiness, awareness, and infrastructure limitations continue to influence adoption decisions. The findings contribute to the growing body of knowledge on digital financial transformation and provide practical insights for policymakers, financial institutions, and technology developers.

Index Terms—Blockchain Technology, Financial Transactions, FinTech Adoption, Digital Finance,

Financial Innovation, Organizational Perception, India, Financial Services.

I. INTRODUCTION

The rapid advancement of digital technologies has transformed the global financial landscape, leading to the emergence of innovative financial solutions collectively known as Financial Technology (FinTech). Among these innovations, blockchain technology has gained significant attention due to its ability to provide secure, transparent, decentralized, and tamper-resistant transaction mechanisms. Originally developed as the underlying technology for cryptocurrencies, blockchain has evolved into a versatile platform with applications across various financial functions, including payments, settlements, trade finance, asset management, identity verification, and regulatory compliance.

The financial sector has increasingly recognized blockchain as a strategic technology capable of addressing inefficiencies associated with traditional transaction systems. By eliminating intermediaries, reducing transaction costs, enhancing transparency, and improving operational efficiency, blockchain has the potential to revolutionize financial services. Governments, banks, financial institutions, and technology firms worldwide are actively exploring blockchain-based solutions to enhance customer experiences and strengthen financial infrastructure. In India, digital transformation initiatives, increasing internet penetration, fintech innovation, and government-led programs promoting digital payments

have accelerated interest in blockchain technology. Nevertheless, the extent of organizational adoption varies considerably due to factors such as regulatory uncertainty, implementation costs, technological complexity, cybersecurity concerns, and institutional readiness. Consequently, understanding the current status of blockchain adoption and identifying areas of application have become important for both academic research and policy formulation.

Against this backdrop, the present study investigates the adoption and implementation of blockchain technology in financial transactions and explores organizational perceptions regarding its current and future role in the Indian financial sector. The study seeks to provide empirical evidence on adoption patterns, perceived benefits, and implementation trends, thereby contributing to the broader discourse on digital financial transformation.

II. RESEARCH OBJECTIVES

1. To examine the current level of adoption and implementation of blockchain technology in financial transactions among organizations in India.
2. To analyze organizational perceptions regarding the applications and adoption status of blockchain technology in the Indian financial sector.

III. SIGNIFICANCE OF THE STUDY

The study is significant because blockchain technology is increasingly becoming a critical component of financial innovation and digital transformation. Understanding its adoption patterns, implementation status, and organizational perceptions can assist policymakers, financial institutions, and technology providers in identifying barriers and opportunities associated with blockchain deployment. The findings provide valuable insights into the readiness of organizations to embrace emerging financial technologies and contribute to informed decision-making regarding regulatory frameworks, technological investments, and strategic planning. Furthermore, the study enriches the existing literature on blockchain adoption within the Indian financial ecosystem and serves as a useful reference for future academic research and industry practices.

IV. REVIEW OF LITERATURE

Blockchain technology has emerged as a transformative innovation with significant implications for financial transactions, banking operations, and digital financial ecosystems. The growing body of literature has examined blockchain adoption from technological, organizational, security, regulatory, and performance perspectives.

Early studies focused on understanding the foundational factors influencing blockchain adoption. Dadd and Gyasi (2020) proposed a blockchain adoption model for the global banking industry and highlighted technological readiness, organizational commitment, and regulatory support as essential drivers of successful implementation. Similarly, Janssen et al. (2020) developed a comprehensive framework integrating institutional, market, and technical factors, emphasizing that blockchain adoption is influenced by both internal organizational capabilities and external environmental conditions. Colomo-Palacios et al. (2020) conducted a critical review of blockchain assessment initiatives and concluded that organizations require structured evaluation mechanisms to determine the feasibility and strategic value of blockchain implementation.

Research has increasingly focused on blockchain applications within banking and financial services. Smith and Dhillon (2020) examined blockchain's potential for enhancing cybersecurity in financial transactions and found that distributed ledger technology significantly improves transaction security, data integrity, and fraud prevention mechanisms. Osmani et al. (2021) analyzed the costs, benefits, risks, and opportunities associated with blockchain implementation in banking and finance, concluding that although the technology offers substantial efficiency gains, regulatory uncertainties and implementation costs remain significant barriers. Alzahrani et al. (2022) assessed blockchain adoption in electronic record management systems and demonstrated that trust, security, and data transparency are critical determinants influencing adoption decisions.

Several studies have investigated blockchain adoption in the banking sector using behavioral and technology acceptance frameworks. Jena (2022) employed an extended Unified Theory of Acceptance and Use of Technology (UTAUT) model and found that

performance expectancy, facilitating conditions, social influence, and perceived trust significantly influence blockchain adoption intentions among banking professionals. Ramchandra et al. (2022) examined the impact of blockchain technology on the banking industry and reported improvements in operational efficiency, transaction transparency, and customer trust. Renduchintala et al. (2022), through a comprehensive survey of fintech applications, identified payments, settlements, digital identity management, lending, and trade finance as major areas where blockchain is creating value within the financial sector.

Recent studies have expanded the discussion toward organizational performance and strategic outcomes. Bag et al. (2023) investigated blockchain adoption among small and medium enterprises and found a positive relationship between blockchain implementation and organizational performance, particularly in operational efficiency and supply chain transparency. Tseng et al. (2023) compared blockchain adoption and business performance in large enterprises across the United States and China and observed that organizations with higher levels of blockchain integration demonstrated superior business performance and competitive advantage. Marengo and Pagano (2023), through a systematic literature review covering multiple countries and industries, identified technological compatibility, regulatory support, organizational readiness, and perceived benefits as the most influential determinants of blockchain adoption.

The role of blockchain in financial services has also received considerable scholarly attention. Miah et al. (2023) examined the current status, adoption challenges, and future prospects of blockchain in financial services and concluded that while adoption is steadily increasing, challenges such as scalability, interoperability, and regulatory compliance continue to restrict widespread implementation. Weerawarna et al. (2023) conducted a content analysis of blockchain advancements in finance and highlighted the growing integration of blockchain into digital payment systems, decentralized finance (DeFi), smart contracts, and cross-border transactions. Li (2023) explored blockchain-based approaches for financial and monetary security risk assessment and demonstrated that blockchain significantly strengthens information security and financial risk management frameworks.

Country-specific investigations have further enriched the understanding of blockchain adoption dynamics. Kostrikova (2020) assessed blockchain adoption factors within Latvia's economy and identified institutional support, technological infrastructure, and innovation readiness as key determinants of successful implementation. Lu et al. (2024) investigated blockchain adoption in Taiwan's banking industry and found that perceived security, regulatory compliance, organizational support, and technological capability significantly influence adoption decisions. These findings suggest that contextual factors and national regulatory environments play a critical role in shaping blockchain implementation outcomes.

Recent literature has also emphasized blockchain's transformative role in modern financial markets. Bennet et al. (2024) described blockchain as a revolutionary technology capable of reshaping digital transactions through improved transparency, decentralization, and trust mechanisms. Rjoub et al. (2023) integrated blockchain technology with advanced FinTech applications and demonstrated its effectiveness in enhancing financial service delivery through intelligent decision-making systems. Judijanto et al. (2025) further examined blockchain integration within financial systems and reported positive impacts on market efficiency, transaction security, financial stability, and operational transparency, reinforcing blockchain's growing significance in modern financial ecosystems.

Thus, the existing literature consistently highlights blockchain technology as a strategic innovation capable of transforming financial transactions, improving operational efficiency, enhancing security, and supporting financial innovation. However, adoption levels vary across industries, organizations, and countries due to differences in technological readiness, regulatory frameworks, awareness levels, and organizational capabilities.

V. RESEARCH GAP

Despite the substantial body of literature on blockchain technology adoption, several research gaps remain. Most previous studies have primarily focused on theoretical adoption models, technological determinants, security aspects, or country-specific analyses within developed economies. Limited empirical research has examined the current state of

blockchain adoption and implementation within the Indian financial sector from an organizational perspective. Furthermore, existing studies often investigate adoption intentions rather than actual implementation status and practical application areas in financial transactions. There is also a lack of comprehensive research assessing organizational perceptions regarding blockchain adoption levels, implementation readiness, and key financial operations benefiting from blockchain technology. Therefore, the present study addresses this gap by providing empirical evidence on organizational adoption patterns, implementation status, and perceptions of blockchain technology in financial transactions within the Indian financial sector.

VI. RESEARCH METHODOLOGY

The study adopts a descriptive and analytical research design to examine the current state of blockchain technology adoption in financial transactions. Primary data were collected from 500 respondents associated with organizations operating in financial and technology-related sectors using a structured

questionnaire. A convenience and purposive sampling approach was employed to select respondents possessing knowledge of financial technologies and blockchain applications. The collected data were coded and analyzed using SPSS software. Statistical techniques including descriptive statistics, frequency analysis, Chi-square tests, and Analysis of Variance (ANOVA) were utilized to evaluate adoption patterns, organizational perceptions, and significant differences among respondents. The study focuses on understanding the extent of blockchain implementation, major application areas, and perceived adoption levels within the Indian financial sector.

VII. DATA ANALYSIS

H_{01} : The adoption of advanced financial technologies (FinTech solutions) does not significantly differ among organizations.

H_{A1} : The adoption of advanced financial technologies (FinTech solutions) significantly differs among organizations.

Table 1: *Descriptive Statistics of Organizational Adoption of Advanced Financial Technologies (FinTech Solutions)*

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Does your organization currently use advanced financial technologies (FinTech solutions)?	500	2.38	.676	1	3

Table 1 presents the descriptive statistics of organizational adoption of advanced financial technologies (FinTech solutions) based on 500 responses. The mean value of 2.38 indicates that the responses are inclined toward the categories of “No” and “Not Sure,” suggesting that adoption of advanced financial technologies is not uniformly high across all organizations. The standard deviation of 0.676 reflects moderate variability in responses, indicating differences in adoption levels among organizations. The minimum and maximum values of 1 and 3 confirm that responses span all available categories (Yes, No, Not Sure). These results suggest that while some organizations have adopted advanced financial technologies, a considerable proportion either have not adopted them or remain uncertain, indicating variation in adoption levels across organizations.

Table 2: *Observed and Expected Frequency Distribution of Organizational Use of Advanced Financial Technologies (FinTech Solutions)*

Does your organization currently use advanced financial technologies (FinTech solutions)?			
	Observed N	Expected N	Residual
Yes	55	166.7	-111.7
No	198	166.7	31.3
Not Sure	247	166.7	80.3
Total	500		

Table 2 presents the comparison between observed and expected frequencies of organizational use of advanced financial technologies (FinTech solutions). The expected frequency for each category is 166.7, assuming equal distribution. However, the observed

frequencies show noticeable variation, with only 55 respondents reporting “Yes,” which is substantially lower than expected, resulting in a large negative residual of -111.7. In contrast, the “No” category records 198 respondents, slightly higher than expected with a positive residual of 31.3, while the “Not Sure” category has the highest observed frequency of 247 respondents, significantly exceeding the expected value with a residual of 80.3.

These results indicate a clear deviation from equal distribution, suggesting that a large proportion of respondents are either uncertain or report non-adoption of advanced financial technologies within their organizations. The high positive residual for the “Not Sure” category reflects a considerable level of uncertainty or lack of awareness among respondents regarding the use of such technologies. This variation supports the assumption that adoption of advanced financial technologies differs across organizations and is not uniformly distributed.

Table 3: Chi-Square Test Results for Differences in Adoption of Advanced Financial Technologies (FinTech Solutions) among Organizations

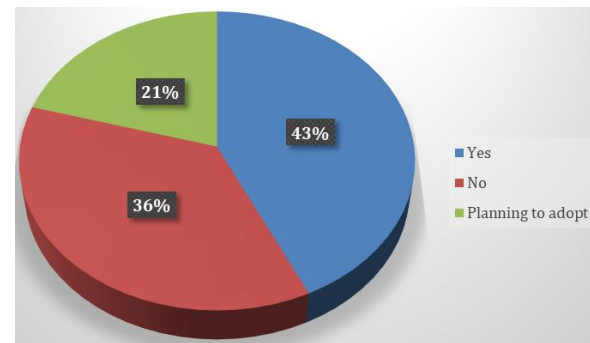
Test Statistics	
	Does your organization currently use advanced financial technologies (FinTech solutions)?
Chi-Square	119.428 ^a
df	2
Asymp. Sig.	.000
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 166.7.	

Table 3 presents the results of the Chi-Square test conducted to examine whether there is a significant difference in the adoption of advanced financial technologies (FinTech solutions) among organizations. The calculated Chi-Square value is 119.428 with 2 degrees of freedom, and the corresponding significance value (p-value) is 0.000, which is less than the standard level of significance (0.05). This indicates that the observed differences in responses are statistically significant. Since none of the cells have expected frequencies less than 5, the assumptions of the Chi-Square test are satisfied, ensuring the validity of the results. Based on these findings, the null hypothesis (H_{01}) is rejected and the

alternative hypothesis (H_{11}) is accepted, implying that the adoption of advanced financial technologies significantly differs among organizations.

Table 4: Frequency Distribution of Organizational Use of Blockchain Technology in Financial Transactions

Does your organization currently use blockchain technology in financial transactions?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	215	43.0	43.0	43.0
	No	182	36.4	36.4	79.4
	Planning to adopt	103	20.6	20.6	100.0
	Total	500	100.0	100.0	



Graph 1: Graphical Representation of Organizational Use of Blockchain Technology in Financial Transactions

Table 4 and Graph 1 illustrate the frequency distribution of organizational use of blockchain technology in financial transactions. Out of 500 respondents, 215 respondents (43.0%) reported that their organizations currently use blockchain technology, representing the largest proportion. This is followed by 182 respondents (36.4%) who indicated that their organizations do not use blockchain, while 103 respondents (20.6%) stated that their organizations are planning to adopt blockchain technology.

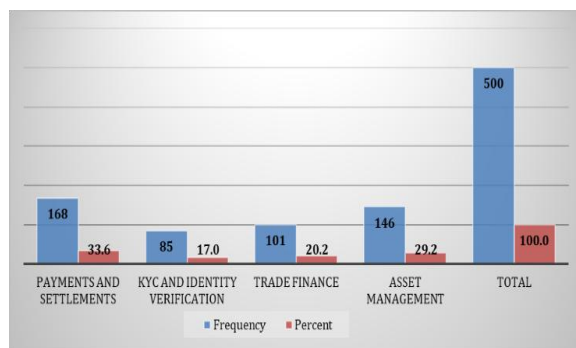
The findings indicate that a considerable proportion of organizations have already adopted blockchain technology, reflecting its growing relevance in the financial sector. At the same time, a significant number of organizations have not yet implemented blockchain, suggesting the presence of barriers such as

cost, regulatory concerns, or lack of technical readiness. The proportion of respondents indicating plans to adopt blockchain highlights future potential for expansion and increased adoption. This

distribution demonstrates that blockchain technology is in a transitional phase, with a mix of adoption, non-adoption, and planned implementation across organizations.

Table 5: Frequency Distribution of Key Financial Operations Benefiting from Blockchain Technology

Which areas of financial operations can benefit most from blockchain?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Payments and Settlements	168	33.6	33.6	33.6
	KYC and Identity Verification	85	17.0	17.0	50.6
	Trade Finance	101	20.2	20.2	70.8
	Asset Management	146	29.2	29.2	100.0
	Total	500	100.0	100.0	



Graph 2: Graphical Representation of Key Financial Operations Benefiting from Blockchain Technology

Table 5 and Graph 2 illustrate the frequency distribution of key financial operations that are perceived to benefit most from blockchain technology. Out of 500 respondents, the highest proportion, 168 respondents (33.6%), identified payments and settlements as the primary area benefiting from blockchain. This is followed by 146 respondents

(29.2%) who indicated asset management, and 101 respondents (20.2%) who selected trade finance. A smaller proportion, 85 respondents (17.0%), identified KYC and identity verification as the key area.

The findings indicate that blockchain technology is largely associated with improving transaction-related functions, particularly payments and settlements, where speed, cost efficiency, and transparency are critical. The significant share for asset management suggests growing recognition of blockchain in managing digital assets and investment processes. Trade finance also reflects notable potential due to its complex documentation and need for transparency. The comparatively lower proportion for KYC and identity verification may indicate limited awareness or slower adoption in compliance-related functions. This distribution highlights the areas where blockchain is perceived to create the greatest value within financial operations.

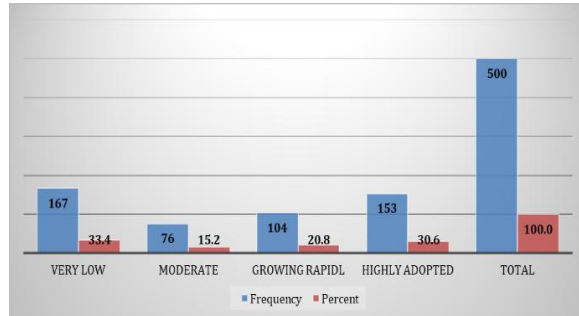
Table 6: Frequency Distribution of Level of Blockchain Adoption in the Indian Financial Sector

What is the level of adoption of blockchain in the Indian financial sector?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Low	167	33.4	33.4	33.4
	Moderate	76	15.2	15.2	48.6
	Growing Rapidl	104	20.8	20.8	69.4
	Highly Adopted	153	30.6	30.6	100.0
	Total	500	100.0	100.0	

Table 6 and Graph 3 illustrate the frequency distribution of respondents' perceptions regarding the level of blockchain adoption in the Indian financial sector. Out of 500 respondents, 167 respondents (33.4%) perceived the level of adoption as very low,

representing the largest proportion. This is followed by 153 respondents (30.6%) who considered blockchain to be highly adopted, while 104 respondents (20.8%) viewed adoption as growing rapidly. A smaller

proportion, 76 respondents (15.2%), rated the level of adoption as moderate.



Graph 3: Graphical Representation of Level of Blockchain Adoption in the Indian Financial Sector

The findings reflect a mixed perception among respondents regarding blockchain adoption in the financial sector. While a significant proportion believes that adoption remains at a very low level, an almost comparable share perceives it as highly adopted, indicating differences in exposure and organizational context. The responses indicating “growing rapidly” suggest a transitional phase where blockchain is gaining momentum but has not yet reached uniform adoption. This variation highlights the evolving nature of blockchain technology in the financial sector, where adoption levels differ across institutions and segments.

VIII. CONCLUSION

The study concludes that blockchain technology is gradually emerging as an important innovation within the Indian financial sector, although its adoption remains uneven across organizations. The findings indicate that a significant proportion of organizations have either adopted blockchain technology or are actively considering its implementation, demonstrating growing recognition of its strategic value. Payments and settlements were identified as the most beneficial application area, highlighting blockchain's potential to improve transaction speed, transparency, and operational efficiency. The statistical results reveal significant differences in the adoption of advanced financial technologies among organizations, suggesting varying levels of technological readiness and awareness. Furthermore, respondents expressed diverse perceptions regarding the current level of blockchain adoption, indicating that the technology is still in a transitional stage of

diffusion. While blockchain offers substantial opportunities for innovation and financial modernization, challenges related to regulation, infrastructure, implementation costs, and technical expertise continue to influence organizational adoption decisions. Overall, the study confirms that blockchain technology possesses considerable potential to reshape financial transactions and contribute to the future development of India's digital financial ecosystem.

Suggestions

1. Financial institutions should invest in blockchain awareness programs and technical capacity-building initiatives to accelerate adoption and implementation.
2. Policymakers should establish a clear and supportive regulatory framework to encourage secure and large-scale blockchain deployment in financial services.

Limitations of the Study

1. The study is limited to responses collected from 500 participants and may not fully represent all organizations operating within the Indian financial sector.
2. The findings are based on respondents' perceptions and may be influenced by individual awareness, experience, and understanding of blockchain technology.

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