ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue IV, April 2026

Blockchain Technology and Cryptocurrency in Financial Services

Abishai Joy Paul, Muthamma B U

School of Economics and Commerce, CMR University, Bangalore, India

DOI: https://doi.org/10.51583/IJLTEMAS.2026.150400126

Received: 26 April 2026; Accepted: 01 May 2026; Published: 21 May 2026

ABSTRACT

Blockchain technology and cryptocurrency have emerged as two of the most consequential financial innovations of the past two decades, yet the gap between their theoretical potential and real-world adoption within mainstream financial services remains conspicuously wide. This paper investigates that gap through a mixed-methods approach, combining a systematic review of thirty peer-reviewed academic sources with primary survey data drawn from 102 respondents representing young, digitally literate demographics. The study finds that while awareness of blockchain and cryptocurrency is relatively widespread, deep comprehension, active usage, and genuine user trust remain limited. Survey respondents show cautious optimism rather than firm conviction — the majority are open to engaging with blockchain-based financial services but are held back by concerns over security, regulatory legitimacy, and a general unfamiliarity with how these technologies actually function. The research identifies four interconnected barriers to adoption: trust deficits, regulatory fragmentation, scalability constraints, and the persistent gap between surface-level awareness and functional understanding. The study concludes that blockchain and cryptocurrency are not questions of 'if' but of 'when' and 'how' — and that realising their potential will require coordinated effort from regulators, financial institutions, technology developers, and educators acting simultaneously rather than sequentially.

Keywords: blockchain technology, cryptocurrency, decentralised finance, financial inclusion, regulatory frameworks, technology adoption, DeFi, smart contracts

INTRODUCTION

Something important happened in October 2008 that most people noticed only in hindsight. In the midst of a global financial crisis that had exposed the structural fragility of centralised banking, an anonymous individual or group operating under the pseudonym Satoshi Nakamoto published a nine-page white paper proposing a peer-to-peer electronic cash system. That document introduced Bitcoin and, more consequentially, blockchain — a decentralised, cryptographically secured ledger capable of recording transactions without the intermediation of any central authority. At the time, few appreciated the breadth of what had been proposed. Today, the implications are still being worked out.

In the years since, blockchain technology has moved well beyond its original cryptocurrency context. It now underpins a growing array of financial applications: cross-border payment systems, trade finance platforms, securities settlement infrastructure, smart contract automation, decentralised finance (DeFi) protocols, and the digital currency experiments of central banks worldwide. Simultaneously, cryptocurrencies — from Bitcoin and Ethereum to stablecoins and central bank digital currencies (CBDCs) — have entered mainstream financial discourse, attracting institutional investment, regulatory scrutiny, and the ambivalent curiosity of hundreds of millions of ordinary people.

And yet, for all this activity, something is clearly not working as quickly as expected. Most blockchain pilots remain pilots. Most cryptocurrency users have tried it once or twice and stepped back. Most regulators are still developing their frameworks. Most ordinary people are aware of blockchain but could not explain, in plain language, how it actually works or why it matters for them personally.

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This paper attempts to take that gap seriously. Rather than cataloguing blockchain's theoretical benefits — a task the existing literature has performed thoroughly — it asks a more grounded question: what does the current state of public awareness, trust, and adoption actually look like, and what would need to change for blockchain to cross from promise into practice? To answer this, the study combines a systematic review of thirty peer-reviewed academic sources with primary survey data from 102 respondents, producing a picture that is neither triumphant nor dismissive, but honest.

REVIEW OF RELATED LITERATURE

The academic literature on blockchain in financial services has grown substantially over the past decade, and a consistent pattern runs through virtually all of it: the gap between enthusiasm and evidence. Researchers have repeatedly documented blockchain's potential to enhance transparency, reduce transaction costs, eliminate intermediaries, and enable new forms of financial inclusion — and have almost as repeatedly noted that real-world implementation lags far behind theoretical capability.

Chang et al. (2020) identified knowledge-hiding behaviour as an underexplored barrier to blockchain adoption in financial institutions, noting that the qualitative frameworks available for understanding this phenomenon remain empirically underdeveloped. Kayani and Hasan (2023) conducted a comparative regulatory analysis between the United Kingdom and the United States, finding that while blockchain's disruptive potential is evident across both jurisdictions, the long-term sustainability of blockchain-based systems and the development of harmonised global regulatory models remain critically unresolved. Albayati, Kim, and Rho (2020) applied an extended Technology Acceptance Model to blockchain adoption, finding that regulatory backing and accumulated user experience were the most powerful determinants of consumer trust — more influential, notably, than the technology's technical features alone.

On the question of decentralised finance, Ozili (2022) observed that the DeFi literature, while growing rapidly, remains heavily benefit-oriented and insufficiently attentive to risks including smart contract vulnerabilities, data theft, and illicit activity propensity. Gan and Lau (2023) identified what they called the trust paradox at the heart of blockchain adoption: a system designed to enable trustless transactions is struggling to earn the trust of the very users it is meant to serve. Their structural equation modelling across 218 bank employees confirmed that individual-level trust congruence significantly influences blockchain acceptance intentions — suggesting that institutional credibility must precede user adoption, not follow from it.

The regulatory dimension of the literature is particularly consistent in its conclusions. Ferreira and Sandner (2021) documented the absence of a coherent EU-wide regulatory framework for crypto assets, highlighting the legal uncertainty this creates for cross-border financial markets. Rajnak and Puschmann (2021) demonstrated through regression analysis across 104 financial institutions that blockchain significantly influences banking business models across dimensions of operational excellence, customer intimacy, and product leadership — but that the mediating role of institutional IT infrastructure remains critically important. Across the thirty sources reviewed for this study, scalability constraints, legacy system incompatibility, security vulnerabilities, and regulatory fragmentation emerge as the four most consistently cited barriers to blockchain's mainstream financial adoption.

RESEARCH METHODOLOGY

This study employs a mixed-methods design, integrating a systematic literature review with original primary data collection. The combination was chosen deliberately: secondary literature provides theoretical grounding and historical context, while primary survey data captures the lived attitudes and practical perspectives of actual and potential users — a dimension that academic analysis alone consistently underrepresents.

The secondary component drew on thirty peer-reviewed articles published between 2016 and 2024, sourced from Google Scholar, ScienceDirect, and Scopus using search terms including 'blockchain financial services,' 'cryptocurrency adoption,' 'decentralised finance,' and 'smart contracts finance.' Inclusion criteria required peer-reviewed publication, English language, direct relevance to blockchain or cryptocurrency in financial contexts,

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and full-text accessibility. Each source was analysed across four dimensions: primary research objective, key findings, barriers and challenges identified, and research gaps acknowledged by the authors. Thematic analysis was then applied across the corpus to identify convergent and divergent patterns.

The primary component consisted of a structured questionnaire administered digitally to 102 respondents. The questionnaire was organised around five thematic areas aligned with the secondary review: general awareness and familiarity with blockchain; cryptocurrency usage behaviour; trust in blockchain-based financial systems; regulatory preferences; and forward-looking attitudes toward blockchain's role in finance. Questions used a combination of multiple-choice and scaled response formats. Convenience sampling was adopted, consistent with the exploratory research design and the study's undergraduate capstone context. Descriptive statistical analysis was applied to the primary data, with frequency distributions and visual representations used to identify response patterns. Cross-referencing of primary and secondary findings was used throughout to strengthen analytical conclusions through methodological triangulation.

FINDINGS AND ANALYSIS

Demographic Profile and Its Implications

The survey sample was heavily concentrated among younger respondents. A total of 78.4% fell within the 18 to 25 age bracket, with the remaining 21.6% aged between 26 and 35. No respondents from older cohorts participated. Educationally, 68% were undergraduates, 18% came from secondary school backgrounds, and 14% were postgraduates. This demographic profile is not incidental — it reflects the social reality that blockchain and cryptocurrency are technologies disproportionately encountered, discussed, and experimented with by younger, digitally connected generations. It also means the findings should be read with appropriate scope awareness: these are the attitudes of tomorrow's finance users, not today's decision-makers.

The Awareness-Understanding Gap

When asked about their familiarity with blockchain technology, respondents revealed a telling divide. While relatively few were entirely unaware of the technology's existence, 35.3% described themselves as not at all familiar with how it works, and 41.2% characterised their familiarity as only slight. A mere fraction considered themselves highly knowledgeable. This distribution captures something important: blockchain has achieved name recognition — largely via Bitcoin's media prominence — without achieving functional comprehension. People have heard the word; most do not understand the concept. This mirrors the pattern identified consistently in the secondary literature, where researchers from Yli-Huumo et al. (2016) to Moosavi et al. (2024) have noted that public understanding systematically trails technological development.

Cryptocurrency: Known but Not Used

The cryptocurrency usage data revealed a similarly instructive gap between awareness and behaviour. Some 45.1% of respondents had heard of cryptocurrency but never used it; 35.3% had tried it on one or two occasions; only 7.8% used it with any regularity. The pattern is one of wide cultural familiarity coupled with narrow practical engagement. Cryptocurrency occupies a curious social position: it is referenced in news, debated in conversation, and treated as shorthand for technological modernity — yet for most people, it remains an abstraction. The barriers preventing the step from curiosity to use — perceived complexity, financial risk, lack of institutional endorsement, and uncertainty about practical utility in everyday life — are consistent with those identified in the adoption literature, particularly Alkhwaldi et al. (2022) and Yeong et al. (2022).

The Trust Paradox

Perhaps the most revealing finding of the study concerns trust. When asked how much they trusted blockchain-based financial transactions, 38% of respondents said 'slightly,' 32% said 'moderately,' and 26% said 'not at all.' A very small group expressed complete confidence. The aggregate picture is one of pervasive scepticism in a system whose foundational promise is the elimination of the need for trust between parties. This is a genuine paradox. Blockchain was designed precisely to enable transactions between parties who do not trust each other,

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by substituting institutional intermediaries with cryptographic verification. And yet, it has failed to earn the trust of ordinary users who are, in most cases, not being asked to verify anything themselves. What they are being asked to do is trust the technology — and this, it turns out, is a fundamentally different proposition. Gan and Lau (2023) identified this dynamic formally, demonstrating that trust in the technology and trust within the community of users are both prerequisites for meaningful adoption, and that blockchain's trustless architecture does not automatically generate either.

Openness With Hesitation

Despite the trust concerns, 67.3% of respondents indicated openness to using blockchain-based financial services in the future, albeit expressed as 'maybe' rather than definite commitment. Only 14.3% were fully certain about future use. This large middle group — curious but unconvinced, interested but not committed — represents the most strategically significant audience for blockchain adoption initiatives. They are not resistant to the technology; they are waiting for sufficient reassurance, clarity, and practical value before they engage. Converting this latent openness into active adoption is both the central challenge and the primary opportunity for the financial sector in the years ahead.

Security and Regulation as Adoption Drivers

When asked what would most influence their decision to use cryptocurrency, respondents prioritised security and safety (44.9%) and government approval (34.7%) far above peer recommendations (16.3%) or ease of access. This finding reframes the adoption challenge in important ways. It suggests that the decision to engage with blockchain-based finance is not, for most people, primarily a social or convenience decision. It is a question of institutional trust: does the system protect my money, and does a legitimate authority stand behind it? Ironically, these are precisely the guarantees that blockchain's decentralised architecture is designed to make unnecessary — yet they remain the conditions under which ordinary users are willing to engage. The implication for regulators and financial institutions is direct: people want innovation with guardrails. They are not asking for decentralisation as an end in itself.

Regulation: Balance Over Extremes

On the question of cryptocurrency regulation, respondents demonstrated nuanced thinking rather than polarised positions. Nearly 45% favoured light but meaningful regulation — oversight that provides consumer protection without eliminating the decentralised character of the technology. Some 18.4% supported strict regulation, an equal proportion preferred minimal oversight, and a small group remained neutral. This distribution closely mirrors the regulatory recommendations emerging from the academic literature, particularly those of Chang et al. (2020) and Hughes et al. (2019), who argued for proportionate, risk-based frameworks that enable innovation while maintaining compliance standards.

Complementarity Over Replacement

One of the most grounded findings from the study was the widespread rejection of the idea that cryptocurrency will fully replace traditional banking. A full 62% believed it would only partially replace existing financial systems, preferring a vision of coexistence over disruption. Only 14% envisioned complete replacement. This perspective reflects a realistic understanding of what traditional banking actually represents: not simply a technical infrastructure, but a social institution embedded in decades of legal frameworks, regulatory oversight, and public trust. The respondents' preference for hybrid models — where blockchain and cryptocurrency complement rather than displace existing structures — aligns closely with the empirical work of Anoop and Goldston (2022) on hybrid finance, and with the growing body of literature on CBDC development as a bridge between digital and traditional monetary systems.

DISCUSSION

Taken together, the findings from this study converge on a single central insight: blockchain and cryptocurrency have achieved cultural visibility without achieving practical trust. They are known without being understood,

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discussed without being used, recognised as potentially transformative without being experienced as genuinely accessible. This is not primarily a technical problem, though technical challenges — particularly around scalability and security — remain real. It is fundamentally a human problem: a failure of translation between the language of cryptographic systems and the concerns of ordinary financial users.

The trust paradox identified in the survey data is the clearest expression of this failure. Blockchain was designed to make trust unnecessary at the transactional level by making it structurally impossible for any single party to manipulate the ledger. But users are not asking for transactional trust to be eliminated. They are asking for systemic trust to be established: trust that the broader ecosystem within which blockchain operates — the exchanges, the wallets, the regulatory frameworks, the institutional endorsements — is reliable, safe, and accountable. The technology has built the mechanism; the ecosystem has not yet built the confidence.

This distinction has practical consequences. It suggests that efforts to drive adoption through technical improvement alone — faster consensus mechanisms, cheaper gas fees, more sophisticated smart contract architectures — are necessary but insufficient. What is equally required are clear regulatory frameworks that establish accountability without stifling innovation; education initiatives that explain not just what blockchain is but what it means for real financial decisions; and institutional endorsements that give users the legitimacy signals they are clearly looking for.

The finding that 67.3% of respondents were conditionally open to blockchain-based financial services is, in this context, genuinely encouraging. This is not a resistant population. It is a waiting population. The conditions under which they would engage are not mysterious: they want security assurances, regulatory backing, and interfaces that do not require a computer science degree to navigate. These are achievable conditions. The question is whether the institutions with the capacity to create them — regulators, financial institutions, and technology developers — are prepared to act with the coordinated urgency the moment requires.

CONCLUSION

This study set out to examine not blockchain's potential — which the existing literature has documented at length — but the gap between that potential and the current reality of public understanding, trust, and adoption. What emerges from the combined analysis of thirty academic sources and 102 survey responses is a picture of genuine promise constrained by avoidable obstacles.

Blockchain and cryptocurrency offer real solutions to real problems in the global financial system: the inefficiency of cross-border payments, the opacity of trade finance, the exclusion of unbanked populations from basic financial services, and the counterparty risk embedded in securities settlement. The academic literature is consistent on this. The technology exists. The applications have been designed. The case has been made.

What has not been built with equivalent rigour is the human infrastructure required for these solutions to reach the people they are meant to serve. Trust, comprehension, regulatory clarity, and accessible design are not secondary considerations to be addressed after the technical work is complete. They are conditions for adoption. They should have been primary concerns from the beginning, and they must become primary concerns now.

The respondents in this study are a reasonable proxy for the next generation of financial users. They are aware of blockchain, curious about cryptocurrency, open to innovation, and deeply concerned about security and legitimacy. They are not opposed to the future these technologies represent. They are simply waiting for the future to be built in a way that makes sense to them, that protects them, and that earns their trust through demonstrated reliability rather than theoretical promise.

The direction, as this research suggests, is clear. What remains is the will, and the coordination, to move in it.

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