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Regulatory Challenges and Opportunities in Promoting Digital Financial Services in Rural India

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Abstract: Rural India stands at the cusp of a digital transformation in finance, propelled by innovative public infrastructure like the Unified Payments Interface (UPI), Aadhaar-enabled systems, and Business Correspondent (BC) networks. These digital tools are laying the foundation for greater financial inclusion. However, the path forward is not without obstacles: widespread connectivity gaps, limited digital and financial literacy, low trust in digital platforms, growing cybersecurity threats, and a burgeoning unregulated lending sector all pose significant regulatory challenges. Current regulatory frameworks—such as the Payments Infrastructure Development Fund, data protection norms, and pilot systems like the Unified Lending Interface (ULI)—offer promising avenues for mitigating these challenges by promoting secure, interoperable, and inclusive financial ecosystems. A strategic vision that strengthens rural connectivity, empowers local agents (e.g., BC Sakhis), enhances literacy and consumer awareness, fortifies cybersecurity and grievance mechanisms, and enforces oversight of lending platforms—while fostering open-market innovations like ONDC and digital commons—can unlock the full potential of digital finance in rural India. Through coordinated regulation and community-centric approaches, digital financial services can not only permeate underserved regions but also drive resilient and equitable development.

Keywords: Digital Financial Services, Rural India, Financial Inclusion, Regulatory Challenges, Digital Literacy

I. Introduction

Rural India is poised at a pivotal moment, as the adoption of digital financial services (DFS)—propelled by innovations such as the Unified Payments Interface (UPI), Aadhaar-enabled systems, and proactive Business Correspondent (BC) networks—begins to reshape economic dynamics in underserved regions. The UPI, introduced in 2016 by the National Payments Corporation of India (NPCI), has experienced explosive growth—now facilitating over 600 million daily transactions, pushing the country to the forefront of global real-time payment systems.

This digital transformation is rooted in India's broader " India Stack" ecosystem, combining interoperable Public Digital Infrastructure (UPI, Aadhaar, Account Aggregator Frameworks) with state-led connectivity initiatives such as the National Broadband Mission and Digital India. These foundational platforms have made digital payment systems increasingly accessible, even in remote villages where physical banking infrastructure remains sparse. Indeed, UPI's low-cost, mobile-first design has enabled even small merchants and rural users to participate in digital transactions, effectively reducing dependence on cash and informal lending mechanisms.

Yet, despite this surge in digital infrastructure and capability, deep-rooted structural challenges persist. In many rural pockets, awareness of UPI and other digital tools remains low; a survey by PwC revealed that only 3–7 % of rural Indians actively use UPI, with nearly 40 % of respondents unfamiliar with it altogether. Simultaneously, gaps in reliable internet connectivity and affordable devices continue to hinder adoption, even as initiatives like the Payments Infrastructure Development Fund and feature-phone-friendly apps are introduced to bridge these divides.

Compounding these infrastructural and literacy challenges is a rising tide of cybersecurity threats. India's digital financial landscape now faces sophisticated fraud schemes—powered by spoofing and AI—highlighting the urgent need for stronger regulatory safeguards, consumer protection frameworks, and literacy campaigns.

Amid these complexities, India is also experimenting with innovative models that promise to enhance rural access to finance. For instance, regional fintechs like *airpay* are building localized, frictionless payment ecosystems tailored to rural sensibilities. Meanwhile, community-driven platforms such as *eSamudaay* leverage open-source tools and the ONDC/India Stack infrastructure to empower small entrepreneurs in digital commerce and facilitate access to credit through transaction history-based mechanisms.

In essence, while digital financial inclusion in rural India benefits from robust infrastructure and bold regulatory frameworks, it remains hampered by last-mile connectivity gaps, low digital fluency, trust deficits, emerging cyber risks, and underdeveloped last-mile delivery systems. Addressing these gaps through inclusive policy design, literacy interventions, and secure digital-first approaches is vital for ensuring that DFS become not just accessible, but transformative for rural communities.

II. Methodology

Research Design and Philosophical Underpinning

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This study adopts a mixed-methods research design, integrating both quantitative and qualitative data to capture the nuanced regulatory environment of digital financial services in rural India. Epistemologically, it combines positivism—for systematic, hypothesis-driven measurement—and interpretivism—to understand subjective experiences and local contextuality. This dual stance ensures depth and breadth, balancing statistical insight with lived reality.

Sampling Strategy and Study Area

- Stratified purposive sampling is employed to ensure representation across varied rural contexts—such as connectivity levels, literacy rates, and access to digital infrastructure.
- Villages are selected across diverse states (e.g., Jharkhand, Uttar Pradesh, Kerala), incorporating both digitally progressive and digitally lagging communities to enable a natural-comparison perspective.
- Sample size: Target of approximately 250–300 participants per village, engaging users, business correspondents (BCs), and local service agents (e.g., from CSCs or eSamudaay-like platforms) to vary perspectives and capture operational realities.

Data Collection Methods

a) Quantitative Surveys

- A structured questionnaire, informed by established constructs (e.g., TAM, TPB, TRI), is adapted for rural digital finance regulation contexts.
- Key variables include:
  - Digital literacy, financial literacy, perceived trust/security, usage patterns (e.g., UPI, digital lending, agent services).
  - Regulatory awareness and perceptions of adequacy or gaps.
  - Service disruptions and user grievances experienced.
- Surveys are translated into local languages and back-translated to ensure accuracy—mirroring best practices

b) Qualitative Interviews

- Semi-structured interviews with:
  - Rural users (including women and elderly segments),
  - BC agents, CSC operators, and micro entrepreneurs,
  - Local regulators or district-level officials.
- Aimed at uncovering perceptions of regulatory effectiveness, trust concerns, literacy barriers, and agent experiences in last-mile delivery.

c) Focus Group Discussions (FGDs)

- Conducted with small cohorts—such as SHG (Self-Help Group) members or youth groups—to explore shared challenges and community-level insights

d) Secondary Data Analysis

- Collating existing metrics such as UPI adoption rates, fraud incident data, PMJDY account activity, and digital literacy indices to triangulate findings and validate trends.

Analytical Framework

Quantitative Analysis

- Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess relationships between constructs such as digital literacy, trust, and usage intention.
- Optionally, Fuzzy-Set Qualitative Comparative Analysis (fsQCA) may be employed to uncover combinations of regulatory and digital factors that catalyze success in some villages but not others.

Qualitative Analysis

- Thematic coding, using software like NVivo, to identify recurring patterns around regulatory perception, trust/insecurity, infrastructural pain points, and agent-level constraints.
- Interpretive insights frame systemic barriers and best practices from community-driven models like eSamudaay

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Validity, Reliability, and Ethical Considerations

- Translation fidelity is ensured through back-translation protocols; pilot testing refines questionnaire clarity.
- Triangulation across survey, interview, FGDs, and secondary data boosts internal validity.
- Ethical safeguards include obtaining **informed consent**, **anonymizing responses**, and seeking approvals from relevant local Institutional Review Boards (IRBs).

Limitations and Future Directions

- The study's generalizability may be bounded by purposive sampling, though purposiveness aids in capturing regulatory and infrastructural variation.
- Longitudinal designs would enrich insights into regulatory evolution and adoption patterns—particularly as innovations like ULI and DPDP Act mature.
- Comparative extensions—such as testing this methodology across other developing nations—could help generalize regulatory insights.

Regulatory Challenges in Rural Digital Finance

Connectivity and Access Divide

Despite government efforts like the National Broadband Mission (NBM) to facilitate universal and quality broadband access—especially in remote regions—rural areas continue to suffer from fragile infrastructure, slow internet speeds, and incomplete fiberization. For instance, Right-of-Way approval processes have been streamlined, yet only about 44% of India's required fiber infrastructure has been deployed, keeping many villages offline or underserved.

Feature phones—still the primary digital device in many rural households—face challenges such as SMS delivery failures due to limited storage, uncontrolled spam that fills up memory, and high SIM deactivation rates driven by rising telecom costs. These issues directly impede trustworthy e-KYC and digital financial service delivery.

Digital and Financial Illiteracy

The digital literacy landscape in India presents a stark picture: only a quarter (about 24%) of the population is financially literate, with even lower rates among women and informal-sector workers. In rural areas, merely 37% of the population can perform basic digital tasks like online browsing or emails.

Real-world voices echo these challenges. As one Redditor from rural Odisha lamented:

"The awareness about financial literacy in rural India is quite low… people don't even know terms like insurance… they are left with moneylenders that charge hefty amounts of interest."

This illustrates that simply providing infrastructure isn't enough—the lack of comprehension and trust makes digital inclusion fundamentally fragile.

Fragmented Regulation and Weak Redressal

India's regulatory framework for digital finance is complex and fragmented. Multiple agencies—such as the RBI, SEBI, IRDAI, and MeitY—oversee different aspects, creating ambiguity regarding jurisdiction over areas like data consent, grievance redressal, and cross-sector enforcement.

Although a Digital India Act 2024 is proposed to unify these domains, progress remains slow and stakeholder consultations are ongoing.

Rise of Unregulated Digital Lending ("Shadow Lending")

A growing number of digital lending apps operate outside official supervision, targeting vulnerable populations with exorbitant interest, hidden fees, and aggressive collection tactics. The IMF estimates that six out of ten lending apps were unregistered or illegal in 2021, while over 1,000 such apps continue to operate, according to MeitY.

To address this, the government introduced draft legislation that would impose severe penalties—including up to seven years in prison and ₹1 crore fines—for unauthorized lending, with harsher consequences for deceptive cold recovery — up to ₹2 crore penalties and up to ten years imprisonment. A proposed public database would list authorized lenders and offer reporting tools for illegal ones.

Meanwhile, the RBI has strengthened regulation via new Master Directions issued in May 2025 aimed at curbing predatory practices, improving transparency, and protecting consumer rights in digital lending.

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Cybersecurity Risks and Data Privacy Erosion

Cyber threats are escalating. In FY2024 alone, India recorded 1.342 million UPI-related fraud cases, amounting to ₹1,087 crore in losses. Digital scams are surging, particularly targeting rural and low-income users who have limited awareness of cyber hygiene.

In response, the RBI has urged financial institutions to adopt AI-aware defense mechanisms and a zero-trust cybersecurity framework. Institutions are also warned against over-reliance on third-party vendors, which could become systemic vulnerabilities.

Complementing regulatory efforts is the CyberVaahini initiative—launched by the Data Security Council of India in partnership with the Kyndryl Foundation—to upskill youth and women from Tier-II and III cities in cyber defense, using real-world simulators and training for grassroots preparedness.

Distrust, Behavioral Inertia, and Socio-Cultural Barriers

Even if infrastructure and regulation are in place, adoption remains low due to cultural perceptions and mistrust toward formal systems. Only about 35% of eligible users had adopted digital payment systems by 2021, despite wide availability of tools like UPI and e-KYC.

The reluctance is rooted in fear of fraud, language barriers, and habit—often reinforced among elderly and women in rural contexts. Without building confidence and demonstrating tangible, trusted use cases, digital inclusion can appear superficial rather than transformative.

Opportunities and Regulatory Innovations

UPI as a Credit Access Platform

The Unified Payments Interface (UPI)—India's foundational digital payments layer—has evolved beyond peer-to-peer transfers. Banks can now hook credit lines (e.g., gold, property-backed loans, FDs, investments) directly to UPI apps, enabling rural businesses like food stall operators and vegetable vendors to transact or withdraw cash seamlessly. This innovation promises lower collection costs and streamlined credit access, provided banks upgrade their systems and scale adoption responsibly.

Piloting the Unified Lending Interface (ULI)

ULI, a pilot platform launched by the RBI, aims to revolutionize rural lending via an open-API ecosystem. It enables frictionless flow of borrower data—like land records and Aadhaar e-KYC—to lenders on a consent basis. This accelerates loan appraisal and broadens access for small businesses and farmers.

Regulatory Sandboxes and Innovation Hubs

India's regulators have actively promoted controlled experimentation:

- The RBI and SEBI operate regulatory sandboxes since 2019–2020, facilitating testing of innovations around retail payments, AI-based fraud prevention, MSME lending, and embedded finance. Regulators amended sandbox rules in 2024 to extend cohort durations and ensure compliance with new data laws.
- The RBI Innovation Hub (RBIH), set up in 2021, supports collaborative proof-of-concepts; to date, 34 projects have been initiated and 17 progressed to full-scale implementation.
- A Self-Regulatory Organization (SRO) framework is also under development, allowing sector players to help shape and enforce standards alongside regulators.

The Account Aggregator Ecosystem

The Account Aggregator (AA) framework enables consent-driven, interoperable data sharing among financial entities. As of March 2025:

- 12 licensed Account Aggregators serve over 100 million active users.
- The ecosystem includes 26 Financial Information Providers and 36 Financial Information Users.
- Regulatory mandates require all banks, NBFCs, and insurers to integrate with the AA framework by the end of 2025, ensuring seamless consumer data portability.

CBDC Development & Offline Digital Rupee

The RBI’s digital rupee (e₹)—India’s Central Bank Digital Currency—is being developed with potential offline functionality to serve regions with poor connectivity. Two models are under consideration: a token-based cash-like system and an account-based approach for institutional use. RBI is exploring programmable features and offline transaction support—a boon for rural areas with intermittent internet.

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Open Network for Digital Commerce (ONDC)

ONDC is a government-endorsed open ecommerce network enabling rural producers to access digital markets. Over 4,000 FPOs (Farmer Producer Organizations) have joined, offering thousands of value-added products. By FY2024, about 6,000 FPOs were expected to be onboarded. These platforms encourage market integration and credit visibility for rural entrepreneurs.

Device-Level Accessibility: Touchpoints for the Underconnected

To bridge hardware and connectivity gaps, regulators are encouraging:

- Low-bandwidth apps optimized for feature phones.
- USSD, AEPS, and voice-based interfaces to facilitate financial services without internet or smartphone dependency.

Fintech, RegTech, and Security Innovations

India's fintech regulatory landscape is embracing:

- Artificial intelligence–driven tools for real-time fraud detection, biometric authentication, behavioral analytics, and blockchain-backed transaction transparency.
- Green fintech initiatives supporting eco-friendly payments and sustainable investing, elevating financial inclusion and ESG goals.
- Strengthened regulatory schemes for digital lending—ensuring proceeds go only to borrower accounts and limiting external credit guarantees.

MSME Finance Innovation with CGTMSE

The Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) is scaling digital interventions:

- Over 1 crore loan guarantees have been sanctioned, covering ₹5.2 lakh crore in credit, with 45% first-time borrowers.
- AI-powered risk assessment and digital claim processing (in partnership with NITI Aayog) have cut approval times by 30%. The new MSME Credit Card offers ₹10 lakh revolving credit with automatic guarantee coverage.

State-Level Fintech Skill Ecosystems

Odisha's "BharatNetra" initiative, through IGFTCH, is building a fintech talent pipeline:

- A five-month hybrid fintech and insurtech certificate course—with 7,000 slots over five years—is being launched in collaboration with the National University of Singapore.
- The initiative includes a Global Capability Centre to attract investment and host fintech summits, fostering innovation and inclusion at the grassroots

III. Recommendations

Scale Inclusive Digital Infrastructure

Strengthen Rural Connectivity

Expand rural broadband and mobile access under initiatives like the National Broadband Mission (NBM). Streamline Right-of-Way (RoW) processes to accelerate fiber and tower deployment in underserved areas.

Promote Feature Phone Accessibility

Encourage banks and fintechs to develop low-bandwidth and voice-based apps suited for feature phones. Embed robust cybersecurity measures in these tools to safeguard vulnerable users.

Subsidize Digital Access Points

Extend and enhance the Payments Infrastructure Development Fund to subsidize QR/POS-enabled services in remote districts. Strengthen the Common Service Centres (CSCs) network to serve as local digital access hubs.

Accelerate Rural Credit via UPI and ULI

Link Credit Access to UPI

Enable seamless access to small-ticket credit—like gold-, property-, or investment-backed loans—through UPI-enabled apps. This opens rural vendors and micro-entrepreneurs to formal credit pathways.

Promote Unified Lending Interface (ULI) Uptake

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Push for faster rollout of ULI across lenders, mirroring UPI's success. Offer integration support and awareness campaigns to scale its reach.

Expand Financial Literacy and Inclusion Campaigns

State-Led Saturation Drives

Replicate campaigns like Andhra Pradesh's statewide drive—covering e-KYC updates, bank account activation, and awareness on digital fraud—to drive public outreach and adoption.

Target Financial Education Toward Savings and Trust

Leverage findings that 96% of rural users are inclined to save and invest, and that over half seek financial education. Use local languages, trusted community channels, and hands-on techniques to bolster confidence.

Foster Fintech-Hub Ecosystems and Skill Development

Launch Fintech Talent Hubs

Scale initiatives like Odisha's *BharatNetra* (via IGFTCH) to cultivate fintech and insurtech skills among youth. Such programs build a workforce ready for inclusive innovation.

Encourage Rural-Focused Innovation

Shape policy to support local fintechs like *eSamudaay*, which use community-centric, open-source models to empower micro-entrepreneurs and build local digital platforms.

Strengthen Consumer Protection and Cybersecurity

Implement Ethical AI in Finance

Adopt frameworks like the RBI's FREEAI to develop responsible AI models for credit scoring, fraud detection, and risk governance. Build capacity for AI oversight and ethical deployment across systems like UPI and ULI.

Close Digital-Lending Loopholes

Tighten regulation around shadow lending platforms. Boost transparency via licensed registry systems, and impose penalties or bans on predatory/unregulated operators.

Leverage Credit Guarantees for Micro Enterprises

Integrate CGTMSE Expansion

Use the CGTMSE framework to support rural MSMEs with collateral-free loans. Incentivize AI-integrated claim and risk processes to improve turnaround times.

Launch MSME Credit Cards

Build on the MSME Credit Card model offering revolving credit of up to ₹10 lakh with automatic guarantee cover—streamlining liquidity for small rural businesses.

Facilitate Local-Level Financial Intermediation

Empower Cooperative Banks via UPI

Encourage cooperative banks and credit societies to use UPI for peer-to-peer transactions, micro-transactions in mandis, and recurring mandates—supported by partnerships with advanced sponsor banks.

Embed Financial Services in Local CSCs

Expand CSCs' role beyond utility services to act as fintech education and digital service hubs—providing training, support, and trusted digital access in rural communities.

Promote Public-Private Collaboration

Enable Sandbox Innovation Platforms

Expand fintech regulatory sandboxes and the RBI Innovation Hub to pilot rural solutions—from voice-based banking to agro-credit tech. Open regulatory spaces for testing and scaling.

Encourage Fintech-Bank Partnerships

Foster collaborations between fintech innovators and traditional banks for co-developing products, sharing distribution channels, and leveraging trust networks across rural regions.

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IV. Conclusion

The rural landscape of India stands at a transformative juncture. Robust digital infrastructure platforms—such as UPI, Aadhaar, and emerging initiatives like the Unified Lending Interface (ULI)—have laid the foundation for inclusive financial participation. These platforms, anchored within the broader India Stack ecosystem, are increasingly enabling affordable payments, identity verification, and credit access for underserved rural populations. UPI alone now processes over 600 million transactions daily, and its evolution to include credit-linked features represents both regulatory ingenuity and a leap in financial inclusivity.

However, sustainable transformation depends on more than infrastructure. Deep-seated challenges—including digital and financial illiteracy, connectivity gaps, regulatory fragmentation, cybersecurity risks, and predatory unregulated lending—continue to hinder equitable progress. Without addressing these systemic obstacles, digital finance risks perpetuating exclusion rather than dismantling it.

On the innovation front, promising policy levers are emerging. UPI's promise as a credit-disbursement channel, the scaling of fintech talent through programs like Odisha's *BharatNetra*, and experimentation through regulatory sandboxes point toward a vibrant, future-ready ecosystem.

To harness these developments effectively, a cohesive, multi-stakeholder strategy is essential:

- Further invest in inclusive infrastructure—feature-phone accessibility, offline transaction options, and expanded connectivity must remain priorities to ensure no region is left behind.
- Scale credit-delivery platforms (like UPI and ULI) and support their adoption through technical integration, consumer outreach, and trust-building measures.
- Embed financial literacy and cyber-awareness programs into community institutions—through CSCs, BC agents, and NGOs—to build both capacity and confidence.
- Augment regulatory frameworks for digital lending, data protection, and consumer recourse, guided by innovation-focused, principle-centered governance models.
- Develop local talent pipelines and innovation hubs to ensure that digital tools and governance evolve with input from rural stakeholders themselves.

India's regulatory environment—including institutions like RBI's Innovation Hub, sandbox platforms, and public trust-building tools like Sachet—showcases the capacity for agile and inclusive policymaking.

By strategically weaving together digital public infrastructure, targeted literacy and trust-building, responsible regulation, and community-level innovation, India is forging a path toward truly inclusive rural digital finance. The opportunity is within reach: digital financial services can become a catalyst for resilient livelihoods, equitable economic growth, and rural empowerment.

With thoughtful regulatory stewardship and persistent collaboration, rural India can transform its financial fabric—making digital finance not just accessible, but genuinely transformative.

References

1. Das, S. (2024, August). India to launch platform for rural, small business lending, cenbank governor says. Reuters. Reuters
2. Financial Times. (2025, August 29). India taps homegrown digital payments network to widen access to credit. Financial Times. Financial Times
3. Economictimes.com. (2025, June 12). RBI moots apps for feature phones to deepen financial inclusion. The Economic Times. The Economic Times
4. Times of India. (2025, June 6). PhonePe expands UPI payments to feature phone users. The Times of India. The Times of India
5. Economictimes.com. (2025, July 17). RBI reviews ULI rollout with lenders amid slow adoption. The Economic Times. The Economic Times
6. Financial Times. (2025). What India's economy can teach the UK. Financial Times. Financial Times
7. ETBFSI. (2025, March 1). UPI clocks 575 million daily transactions, records 16.11 billion volume in Feb '25. Economic Times–Fintech. ETBFSI.com
8. India Today. (2025, August 5). UPI sets new record with over 700 million transactions in a single day. India Today. India Today
9. ETBFSI. (2025, March 1). UPI clocks 590 million daily transactions, records 18.30 billion volume in March '25. Economic Times–Fintech. ETBFSI.com
10. Economic Times. (2025, August 18). UPI transactions surge in 2025, daily average value crosses ₹90,000 crore in August: Report. The Economic Times. The Economic Times
11. Financial Express. (2025, August 5). Daily UPI-based transactions surpass 700 million for the first time. The Financial Express. The Financial Express

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue VIII, August 2025

12. ETBFSI. (2025, June 1). UPI clocks 602 million daily transactions, records 18.68 billion volume in May ’25. Economic Times–Fintech. ETBFSI.com
13. ETBFSI. (2025, July 1). UPI clocks 613 million daily transactions, records 18.40 billion volume in June ’25. Economic Times–Fintech. ETBFSI.com
14. Economic Times CFO. (2025, August 5). UPI sets new record with 707 million daily transactions. Economic Times CFO. ETCFO.com
15. Entrackr. (2024, August 6). UPI daily transactions cross 500 million mark. Entrackr. Entrackr
16. Financial Express. (2024). RBI expects daily UPI transactions to hit a billion in months. The Financial Express. The Financial Express
17. IBEF. (2025, August 19). UPI transactions surge in 2025, daily average value crosses ₹90,000 crore in August: Report. India Brand Equity Foundation. IBEF
18. Wikipedia contributors. (n.d.). Open Network for Digital Commerce. In Wikipedia. Retrieved Month Day, Year, from Wikipedia. Wikipedia
19. Wikipedia contributors. (n.d.). Unified Payments Interface. In Wikipedia. Retrieved Month Day, Year, from Wikipedia. Wikipedia
20. India Today. (2025). UPI records daily milestone. India Today. India Today
21. Dev, H., Gupta, R., Dharmavaram, S., & Kumar, D. (2024). From cash to cashless: UPI's impact on spending behavior among Indian users and prototyping financially responsible interfaces. arXiv. arXiv
22. Biswas, S. (2021). Effect of mobile financial services on financial behavior in developing economies – Evidence from India. arXiv. arXiv
23. Chakraborti, S., & Sanyal, S. (2015). Heuristic algorithm using Internet of Things and mobility for solving demographic issues in financial inclusion projects. arXiv. arXiv
24. Kester, Q.-A. (2013). The role of rural banks in providing mobile money services to rural poor communities: An effective integration approach of rural banks and existing mobile communications infrastructure. arXiv. arXiv