From Access to Capability: The Role of Robo-Advisory Technology in India's Financial Inclusion Agenda

Dr. Shishir Srivastava,

Assistant Professor, Department of Commerce, Rajkiya Mahila Mahavidyalaya, Sheikh Sarai, Sitapur, University of Lucknow

Ms. Tapsi Srivastava

Research Scholar, University of Lucknow

How to Cite this Article:
Srivastava, T. (2026). From Access to Capability: The Role of Robo-Advisory Technology in India's Financial Inclusion Agenda. International Journal of Creative and Open Research in Engineering and Management, 02(05). https://doi.org/10.55041/ijcope.v2i5.576

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Abstract

India’s ambition to achieve developed-nation status by 2047 depends on extending economic opportunity to every citizen, not only those already financially integrated. Digital public infrastructure has made considerable progress: Aadhaar covers over 1.3 billion residents, UPI processes more than 13 billion transactions monthly, and Jan Dhan accounts exceed 520 million. Yet the gap between having a bank account and receiving coherent investment guidance remains wide. Fewer than 1,000 SEBI-registered investment advisors serve an economy of 1.4 billion people and over 266 million mutual fund folios. Robo-advisors, algorithm-driven platforms that provide automated portfolio construction, rebalancing, and personalised financial guidance at a fraction of traditional advisory costs, offer a scalable answer to this structural deficit. This paper examines the potential of robo-advisory technology to advance financial inclusion within the Viksit Bharat @2047 framework. Drawing on secondary data and published research spanning regulatory reports and empirical adoption studies, the paper traces the global and Indian evolution of robo-advisory services, maps the current platform landscape, identifies the structural enablers and constraints specific to the Indian context, and derives policy recommendations. The paper contends that robo-advisory platforms, when embedded in India’s existing digital infrastructure and supported by a dedicated regulatory architecture, can bridge the distance between financial access and financial capability for millions of underserved investors.

Keywords: Robo-advisors; Financial inclusion; Digital public infrastructure; Viksit Bharat; India; SEBI; Algorithmic advisory

I. INTRODUCTION

The Viksit Bharat @2047 vision, India's roadmap to developed-nation status at the centenary of its independence, places economic inclusion at the centre of national policy. Financial inclusion, understood not merely as access to banking services but as the ability to make informed financial decisions and participate meaningfully in wealth creation, is indispensable to that vision. Over the past decade, India has assembled one of the world's most ambitious digital public infrastructure ecosystems. The India Stack, comprising Aadhaar for biometric identity, Jan Dhan Yojana for mass bank account enrollment, and the Unified Payments Interface (UPI) for real-time digital payments, has transformed interactions between hundreds of millions of citizens and the formal financial system (Niti Aayog, 2023).

By 2025, over 520 million Jan Dhan accounts had been opened, UPI was processing more than 13 billion transactions per month, and India had become the global leader in real-time digital payments, accounting for approximately 46 per cent of global transaction volume (NPCI, 2025). Smartphone penetration has crossed 850 million users, and 5G rollout is accelerating rural connectivity (TRAI, 2025). These developments represent a structural transformation in financial access.

Yet a persistent and underappreciated gap separates financial access from financial capability. Account ownership, payment infrastructure, and digital connectivity are necessary but insufficient conditions for wealth creation. The mutual fund industry crossed INR 60 lakh crore in assets under management in 2024, yet remains heavily skewed toward urban, high-income, and financially literate segments (AMFI, 2024). Fewer than 1,000 SEBI-registered investment advisors serve a country of 1.4 billion people, leaving over 266 million mutual fund folios without professional guidance (SEBI, 2024). The vast majority of retail investors either rely on commission-driven distributors with inherent conflicts of interest or receive no advice at all.

Robo-advisors, automated digital platforms that deploy algorithms to construct personalised investment portfolios, execute rebalancing, and deliver financial planning guidance with minimal human intervention, offer a technologically credible response to this challenge. Operating at annual fees of 0.25–0.50 per cent, compared with the 1–2 per cent charged by traditional advisors, robo-advisory platforms can extend professional-grade guidance to investor segments that conventional advisory models have never reached (Sironi, 2016). This cost advantage, combined with digital scalability, positions robo-advisors as a potential equaliser in a country where the supply of human advisors is structurally inadequate.

This paper examines the intersection of robo-advisory technology and India's financial inclusion agenda. Section 2 reviews the relevant literature. Section 3 describes the methodology. Section 4 traces the concept and global evolution of robo-advisors. Section 5 profiles the Indian landscape. Section 6 analyses the mechanisms through which robo-advisors can advance financial inclusion. Section 7 examines challenges and enablers. Section 8 presents policy recommendations. Section 9 concludes.

II. LITERATURE REVIEW

The academic literature on robo-advisors has expanded substantially since the mid-2010s, though empirical work grounded in non-Western markets remains sparse. This review organises the extant literature across four thematic clusters: definitional and conceptual foundations; adoption and trust; behavioural and welfare outcomes; and the financial inclusion dimension.

2.1 Definitional and Conceptual Foundations

Abraham et al. (2019) provided an early systematic treatment, defining robo-advisors as technology platforms that algorithmically provide financial planning and investment management services based on client-stated goals and risk tolerance, typically without human intermediation. This definition has been widely adopted and remains current, though subsequent work has refined it to accommodate hybrid models. Phoon and Koh (2018) distinguished between fully automated platforms

Sironi (2016) situated robo-advisors within the broader FinTech transformation, arguing that goal-based investing and automated rebalancing could democratise wealth management by removing minimum asset thresholds and high-fee structures that have historically excluded retail investors. Belanche et al. (2019) extended this framing to include artificial intelligence and argued that AI-powered personalisation represents a qualitatively distinct capability from rule-based algorithmic construction.

2.2 Adoption and Trust

Adoption research has drawn extensively on established technology acceptance frameworks. Belanche et al. (2019) applied the Unified Theory of Acceptance and Use of Technology (UTAUT2) and found that performance expectancy, effort expectancy, and social influence are the primary determinants of robo-advisory adoption, while trust operates as a mediating variable. Interestingly, innovativeness had a stronger effect than hedonic motivation, suggesting that early adopters are predominantly curious and financially aware rather than entertainment-driven.

In the Indian context, Bhatia et al. (2020) conducted qualitative research among Indian investors and financial professionals, finding that trust in the platform provider and perceived regulatory protection are the two most significant barriers to adoption. Nain and Rajan (2023) confirmed this finding through in-depth interviews with platform founders, noting that low financial literacy compounds the trust deficit by preventing users from independently evaluating algorithmic recommendations.

Ringe and Ruof (2020) examined regulatory approaches to robo-advisory in developed markets and concluded that sandbox frameworks are the most effective mechanism for enabling innovation while maintaining investor protection, a recommendation with direct relevance to India's policy environment.

2.3 Behavioural and Welfare Outcomes

D'Acunto et al. (2019) analysed a large dataset of brokerage accounts in Germany and found that investors who received algorithmic recommendations exhibited lower portfolio concentration, higher diversification, and lower susceptibility to the disposition effect. The effect was strongest among investors with low prior financial literacy, suggesting that algorithmic guidance may be most valuable precisely where human expertise is absent.

D'Acunto and Rossi (2023) extended this analysis and found that robo-advised investors achieve returns approximately 1.5 percentage points higher per annum than comparable self-directed investors, primarily through better diversification and disciplined rebalancing. Fisch et al. (2019) estimated that over a 30-year horizon, a 1 per cent annual fee difference compounded to 20–30 per cent more terminal wealth, underscoring the material stakes involved in fee democratisation.

2.4 Financial Inclusion and Emerging Markets

Demirguc-Kunt et al. (2022) documented the global access gap and identified cost, distance, and trust as the three primary barriers to the uptake of financial services. In the Indian context, NCFE (2023) reported that only 27 per cent of Indian adults meet the financial literacy threshold, with the gap widest among women, rural residents, and lower-income groups. Grand View Research (2024) projects India's robo-advisory market at a CAGR of 33.4 per cent through 2030, suggesting that commercial and inclusion opportunities are converging, though user penetration of 1.2 per cent, against a global average of 4.6 per cent, indicates that convergence has not yet occurred at scale.

This review identifies three gaps that the present paper addresses: the absence of systematic analysis of robo-advisory in the Indian regulatory and cultural context; the unexplored synergies between robo-advisory platforms and India's digital public infrastructure; and the lack of integration between the robo-advisory literature and the Viksit Bharat @2047 policy framework.

III. METHODOLOGY

This paper adopts a secondary research design grounded in the systematic review and analytical synthesis of published materials. The study draws on peer-reviewed journal articles, regulatory reports, industry analyses, government policy documents, and statistical databases published between 2016 and 2025.

The literature search was conducted across Scopus, Web of Science, and Google Scholar using keyword combinations including "robo-advisor" and "financial inclusion," "algorithmic advisory" and "India," and "digital public infrastructure" and "investment advice." Regulatory documents from SEBI, AMFI, NCFE, Niti Aayog, NPCI, and TRAI were obtained directly from official portals. Market data were sourced from Statista (2024) and Grand View Research (2024).

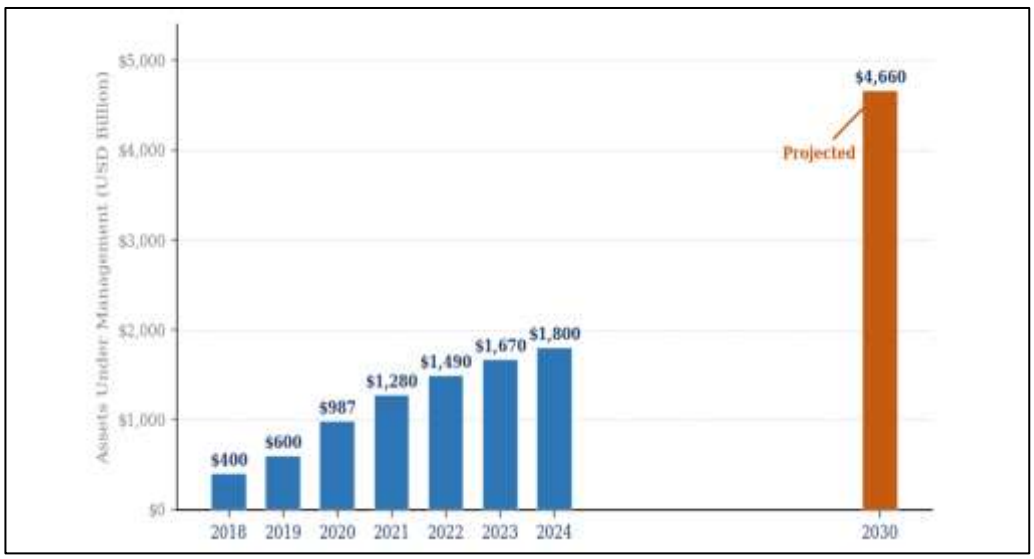
The analytical framework organises findings around four dimensions: the evolution and current state of robo-advisory globally and in India; the mechanisms through which such platforms can advance financial inclusion; the structural enablers and constraints specific to the Indian market; and the policy interventions necessary to realise the technology's inclusive potential. Limitations of this approach include reliance on secondary data, which limits the ability to establish causal relationships, and a potential publication bias toward findings from developed markets.

IV. ROBO-ADVISORS CONCEPT AND GLOBAL EVOLUTION

A robo-advisor is an online platform that employs computer algorithms to provide financial planning and investment management services based on the client's stated goals, risk appetite, and financial circumstances (Abraham et al., 2019). The typical process involves the investor completing a digital questionnaire, following which the algorithm constructs a diversified portfolio, usually comprising low-cost exchange-traded funds and index funds, and then continuously monitors and rebalances it to maintain the target allocation (Phoon & Koh, 2018).

The industry has evolved through three broadly distinguishable phases. The first phase (2010–2015) was characterised by standalone algorithmic platforms built on Modern Portfolio Theory, led by Betterment and Wealthfront in the United States. The second phase (2016–2020) saw the entry of major financial institutions, the emergence of hybrid models, and a sharp acceleration driven by the COVID-19 pandemic. The current phase (2021–present) is characterised by AI-powered personalisation, ESG integration, and growing analytical attention to behavioural outcomes (D'Acunto & Rossi, 2023). Figure 1 illustrates global AUM growth across this trajectory.

Figure 1. Global Robo-Advisory Assets Under Management, 2018-2024 (with 2030 projection)



Source: Statista, 2024; Grand Vier Research, 2024

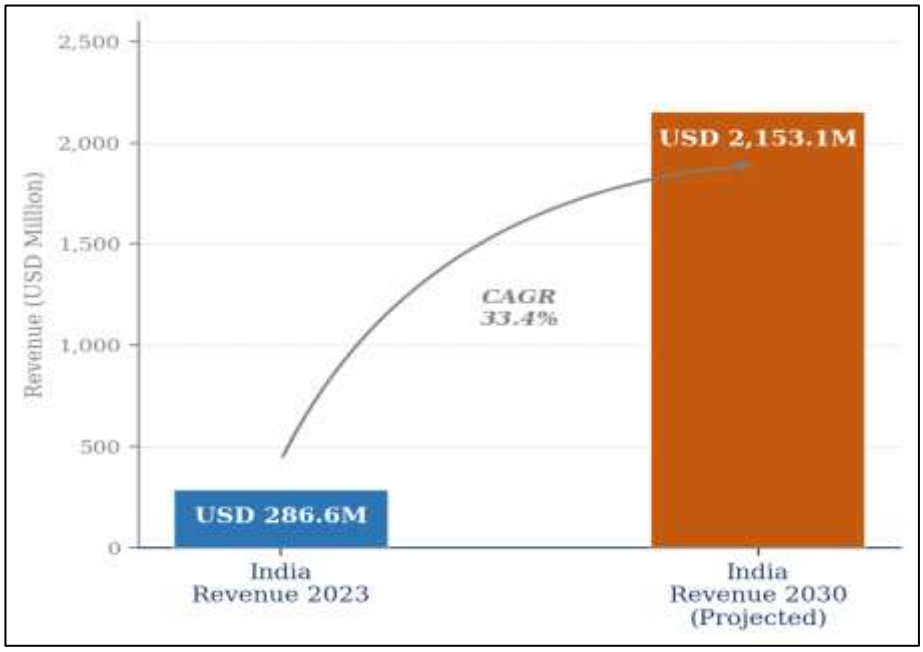
By 2024, global assets under robo-advisory management reached approximately USD 1.8 trillion, with projections suggesting USD 4.66 trillion by 2030 (Statista, 2024). The United States accounts for the largest share, but China, the United Kingdom, and Germany have established significant platforms, and emerging markets, including India, Brazil, and Southeast Asia, are experiencing rapid early-stage growth.

V. THE INDIAN ROBO-ADVISORY LANDSCAPE

India's robo-advisory ecosystem differs from its Western counterparts in several structurally important ways. The dominant model is "execution plus personalised suggestion" rather than fully discretionary management: the platform recommends options, but the investor retains decision-making authority (Bhatia et al., 2020). This architecture reflects both the regulatory environment under the SEBI Investment Advisers Regulations, 2013 and prevailing investor trust in technology-mediated financial decisions.

The market generated approximately USD 286.6 million in revenue in 2023 and is projected to reach USD 2,153.1 million by 2030, implying a CAGR of 33.4 per cent (Grand View Research, 2024). Figure 2 illustrates this growth trajectory, while Figure 3 contextualises India's user penetration relative to the global average.

Figure 2. Indian Robo-Advisory Market Revenue, 2023 Actual vs 2030 Projected



Source: Grand View Research 2024

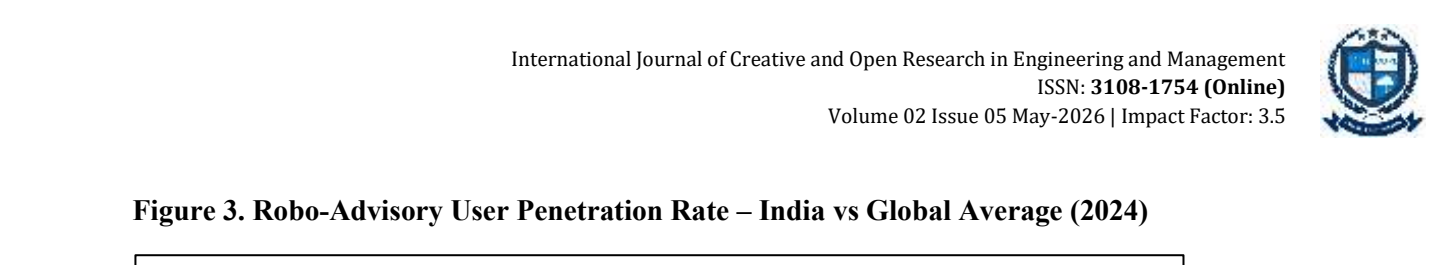
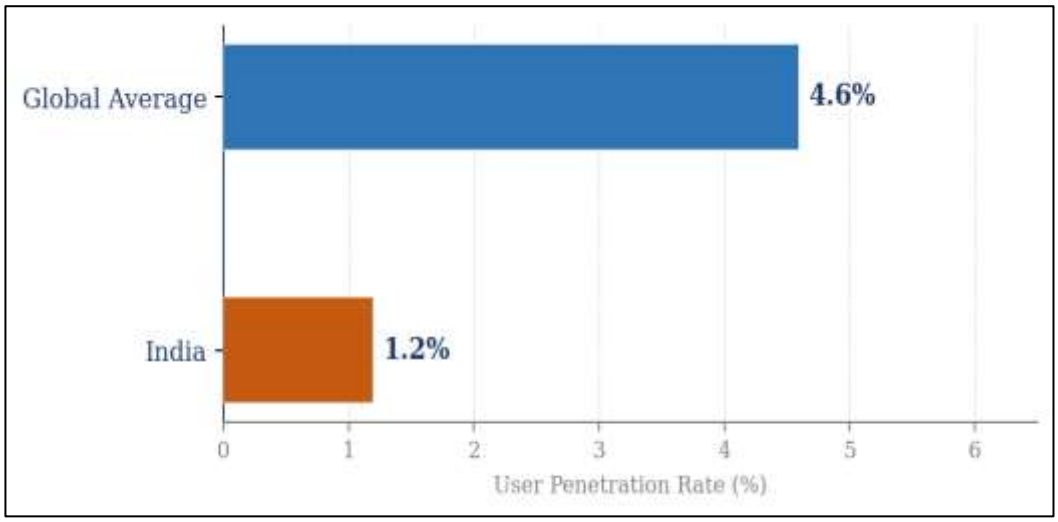


Figure 3. Robo-Advisory User Penetration Rate – India vs Global Average (2024)



Source: Statista 2024

Several platforms now serve Indian retail investors across different advisory models and target segments. Table 1 maps the current platform landscape.

Table 1: ***Major Indian Robo-Advisory Platforms: Comparative Overview (2024)***

Platform	**Advisory Model**	**Key Features**	**Target Segment**	**Fee Structure**
Scripbox	Execution + Suggestion	Goal-based MF selection automated rebalancing	Urban salaried investors	0%–0.5% p.a.
Kuvera	Direct Plan Execution	Zero-commission direct funds; portfolio tracker	Cost-conscious retail investors	Free (premium tier available)
INDmoney	Aggregation + Advisory	Multi-asset aggregation AI-driven suggestions	Urban professionals, HNIs	Free (subscription plans)
Groww	Execution + Suggestions	Equity, MF, NPS integrated recommendation engine	Young first-time investors	Free (equity brokerage)
Zerodha Coin	Direct Plan Execution	Zero-commission direct MFs; integrated with Kite	Active equity + MF investors	Free
Fisdom	Hybrid B2B2C	Workplace financial wellness; employer partnerships	Salaried employees via the HR channel	0.3%–0.5% p.a.
ET Money	Execution + Advisory	Smart deposit, SIP automation, and expense tracking	Mass-market digital users	Free (Genius tier fee-based)

Source: Authors' compilation from platform websites and Nain & Rajan (2023)

A notable characteristic of the Indian market is its demographic concentration. The majority of existing users are urban, salaried professionals aged 25 to 40 with prior experience in mutual funds. The segments most relevant to financial inclusion, first-time investors in semi-urban and rural areas, women, and economically weaker sections, remain largely untapped.

VI. ROBO-ADVISORS AS INSTRUMENTS OF FINANCIAL INCLUSION

The potential of robo-advisors to advance financial inclusion in India rests on four interconnected mechanisms. Table 2 first contextualises the comparative advantage of robo-advisory over traditional advisory along dimensions directly relevant to inclusion.

Table 2: ***Traditional Advisory versus Robo-Advisory: A Comparative Overview***

Dimension	Traditional Advisory	Robo-Advisory
Minimum Investment	Typically INR 5–50 lakh or more	No minimum; SIP from INR 500
Annual Cost	1–2% advisory fee + distributio commissions	0.25–0.50% platform fee (direct plans)
Long-run Wealth Impact	Fee drag reduces terminal wealth significantly	20–30% more terminal wealth over 3(years (Fisch et al., 2019)
Scalability	Limited by the human advisor capacity	Unlimited simultaneous clients
Behavioural Bia Control	Dependent on the individual advisor' quality	Rules-based; immune to emotiona triggers
Accessibility	Urban; in-person requirement	Digital-only; accessible via smartphon
Regulatory Framework	SEBI Investment Adviser Regulations, 2013	Currently governed under the sam regulations (dedicated framewor pending)
Personalisation	High (human judgement)	Moderate-High (AI/ML-driven)
Trust Level (India)	High (personal relationships)	Developing (lower among first generation investors)

Source: Authors' compilation

6.1 Closing the Advisory Gap

With fewer than 1,000 SEBI-registered investment advisors for a population of 1.4 billion, the arithmetic of conventional advisory is unfavourable. Robo-advisory platforms remove the binding constraint: an algorithm can serve an unlimited number of clients simultaneously without degradation in advice quality or increase in per-client cost. D'Acunto et al. (2019) demonstrated that algorithmically advised investors make better-diversified, less emotionally distorted portfolio decisions than self-directed investors, with the largest improvement among those with the least prior financial experience.

6.2 Reducing the Cost Barrier

Robo-advisory platforms operating on a direct plan model eliminate the commission layer entirely, typically charging annual fees of 0.25–0.50 per cent against the 1–2 per cent associated with regular plan mutual fund distribution (Sironi, 2016). Fisch et al. (2019) modelled this fee differential and found that investors in low-fee automated accounts accumulate 20–30 per cent more terminal wealth over 30 years through the compounding effect of fee savings alone. For small investors with INR 5,000–10,000 in monthly investable surplus, this differential is the difference between achieving and falling short of long-term goals such as home purchase, education funding, or retirement security.

6.3 Leveraging India's Digital Public Infrastructure

Aadhaar-based eKYC enables investor verification and account opening in minutes, without physical documentation. UPI provides seamless, low-cost payment integration for SIP instalments. Jan Dhan accounts provide the entry point for investors at the base of the income pyramid. DigiLocker enables digital document management. Platforms that integrate with this infrastructure can reach investors in semi-urban and rural areas that physical advisory networks have never served.

6.4 Mitigating Behavioural Biases

Retail investors suffer from cognitive biases, including overconfidence, loss aversion, herding behaviour, and home bias, that lead to systematic underperformance (D'Acunto et al., 2019; Bhatia et al., 2020). Robo-advisors enforce rules-based investment processes insulated from these biases. D'Acunto and Rossi (2023) found that the welfare improvement from algorithmic advice is larger for investors with lower financial literacy, a finding directly relevant to the financial inclusion agenda.

VII. CHALLENGES AND ENABLERS

The adoption of robo-advisory platforms at scale in India is shaped by structural challenges and countervailing enablers. Table 3 organises these systematically across seven dimensions.

Table 3: ***Challenges and Enablers for Robo-Advisory Adoption in India***

Dimension	Challenge	Enabler
Regulatory Environment	Absence of a dedicated framework fo algorithmic advisory; compliance ambiguity under the 2013 regulations	SEBI Innovation Sandbox (2019) international sandbox models available for adaptation
Trust and Familiarity	Low trust in algorithm-mediated financial decisions, especially among older and first-generation investors	Growing normalisation of app-based finance via UPI; institutional entry lends credibility
Financial Literacy	Only 27% of adults meet the financial literacy threshold (NCFE, 2023), which limits their ability to evaluate recommendations	SEBI and AMFI mandated investor education programmes; potential to include robo-advisory awareness
Digital Access	Rural-urban internet usage gap; smartphone literacy is uneven	850M+ smartphone users (TRAI, 2025); 5G rollout accelerating rural connectivity
Advisory Mode Constraints	Regulatory limits restrict most platforms to suggestion-only models, reducing effectiveness vs discretionary	Hybrid models combining algorithms with human escalation can address cultural preferences
Behavioural Adoption	Cultural preference for personal advisory relationships; resistance among older demographics	65%+ population under 35; digitally comfortable demographic entering prime savings years
Infrastructure Integration	Lack of native integration between robo advisory platforms and India Stack	Aadhaar eKYC, UPI, DigiLocker, and Account Aggregator framework provide a ready backbone

Source: Authors' compilation

7.1 Regulatory Uncertainty

The most consequential constraint is regulatory ambiguity. SEBI's Investment Advisers Regulations, 2013, were drafted with human advisors in mind and impose requirements that automated platforms cannot satisfy without workarounds. Nain and Rajan (2023) found that platform founders consistently identify regulatory uncertainty as the primary obstacle to product development and investor acquisition. Singapore, the United Kingdom, and Australia have developed dedicated frameworks for algorithmic advisory; Ringe and Ruof (2020) recommend regulatory sandboxes as the most effective enabling mechanism.

7.2 Trust and Financial Literacy

Bhatia et al. (2020) found that Indian investors' willingness to delegate portfolio decisions to an algorithm is significantly lower than in comparable Western samples. NCFE (2023) documented that only 27 per cent of Indian adults meet the financial literacy threshold, with the gap most pronounced among women, rural

residents, and lower-income segments. Low financial literacy both suppresses adoption and increases vulnerability to poorly designed platforms.

7.3 Structural Enablers

Several factors favour adoption at scale. India's demographic profile, with over 65 per cent of the population under 35, provides a large base of digitally comfortable potential investors entering their prime earning years. The normalisation of app-based money management through UPI has reduced the psychological distance between digital channels and financial transactions. The SIP model maps naturally onto automated regular investment functionality. The entry of established financial institutions into the space lends institutional credibility, and the continuity of government policy under Digital India provides a supportive macroeconomic environment.

VIII. POLICY RECOMMENDATIONS FOR INDIA'S FINANCIAL INCLUSION AGENDA

The analysis generates four interconnected policy recommendations.

First, SEBI should develop a dedicated regulatory framework for algorithmic advisory services that addresses digital onboarding and eKYC equivalence, fiduciary responsibility, minimum disclosure standards, grievance redressal mechanisms, and performance reporting requirements. A formal sandbox programme for robo-advisory, building on the 2019 Innovation Sandbox precedent, would allow platforms to test product features under regulatory supervision. Singapore's Financial Services and Markets Act (2022) and the UK FCA's Regulatory Sandbox provide workable models adaptable to Indian conditions.

Second, platforms should be designed to integrate natively with the India Stack. Aadhaar-based eKYC for identity verification, UPI for transaction execution, DigiLocker for document management, and the Account Aggregator framework for portfolio consolidation collectively provide the infrastructure for a frictionless investor journey from onboarding to ongoing advice. SEBI and the RBI should jointly facilitate interoperability between the Account Aggregator ecosystem and robo-advisory platforms.

Third, financial literacy programmes administered through SEBI's Investor Education and Protection Fund and AMFI's Mutual Fund Sahi Hai campaign should be extended to include awareness of automated advisory as a legitimate, regulated, and cost-effective advisory channel. Current campaigns focus on product awareness without explicitly addressing the advisory channel through which investors access these products.

Fourth, hybrid models combining algorithmic efficiency with optional human touchpoints should be incentivised through regulatory design. Cultural preferences for personal advisory relationships are well-documented in the Indian context (Bhatia et al., 2020). Platforms that offer human escalation can address the trust deficit among first-generation investors without abandoning the cost and scalability advantages of the automated model.

IX. CONCLUSION

India has built the foundation for financial inclusion at a scale unmatched elsewhere: a biometric identity system covering virtually the entire population, a real-time payment network processing over a billion transactions daily, and a bank account in almost every household. What the country has not yet built is the advisory layer connecting these accounts to purposeful investment.

Robo-advisory technology is one of the more credible candidates for that layer. The cost economics are favourable, the algorithmic scalability is suited to a market of this size, and the evidence from more mature markets suggests that algorithmically advised investors make better financial decisions and accumulate more wealth over time, with the largest gains among those with the least prior financial experience. The infrastructure is in place. The demographic tailwind is real. The commercial trajectory, a market projected to grow from USD 287 million to USD 2.15 billion in seven years, suggests that private-sector momentum is building.

What remains is institutional resolution. A dedicated regulatory framework for algorithmic advisory, genuine integration of robo-advisory platforms with the India Stack, and financial literacy initiatives that present automated advice as a legitimate channel rather than an exotic technology are achievable policy goals within the Viksit Bharat @2047 timeline. If these conditions are met, robo-advisory platforms can do for investment guidance what UPI did for payments: convert an expensive, access-constrained service into a public utility.

Future research should pursue primary empirical work in the Indian context, particularly longitudinal studies of investor outcomes across advisory models and investor segments, analyses of adoption decisions among first-generation investors with low financial literacy, and evaluations of the regulatory sandbox interventions recommended here.

Declarations

Conflict of Interest: The authors declare no conflict of interest.

Funding: This research received no external funding.

Data Availability: The study draws entirely on publicly available secondary data. All sources are cited in the references.

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