

ARTIFICIAL INTELLIGENCE AND THE TRANSFORMATION OF MORTGAGE LENDING IN INDIA

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Abstract

India's housing finance sector stands at a critical inflection point. Rising urbanisation, a growing middle class, and government-led affordable housing initiatives have expanded mortgage demand dramatically; yet the traditional lending model – characterised by manual underwriting, paper-intensive documentation, and branch-dependent distribution – has struggled to keep pace. Artificial intelligence (AI) has emerged as the key technological disruptor capable of bridging this structural gap. This paper examines how AI is reshaping mortgage origination, credit assessment, fraud detection, and regulatory compliance within the distinct context of the Indian financial ecosystem. Drawing on market data, regulatory developments including the Reserve Bank of India's Digital Lending Directions 2025, and industry case studies, the paper argues that AI-driven innovation is not merely improving operational efficiency but is fundamentally democratising access to housing credit for underserved populations. Challenges around data privacy, algorithmic bias, and the need for explainable AI are also critically examined, along with a forward-looking policy framework for responsible adoption.

Keywords: Artificial Intelligence, Mortgage Lending, Housing Finance, India, Fintech, Credit Assessment, RBI, Financial Inclusion

1. Introduction

Homeownership occupies a unique place in India's social and economic fabric. For hundreds of millions of households, the acquisition of residential property is not merely a financial transaction but a generational aspiration. Yet despite this cultural centrality, India's mortgage market remains structurally under-penetrated. The country's mortgage-to-GDP ratio stood at 12.5 per cent in 2024, rising steadily from 3.4 per cent in 2001, but still well below the 60-80 per cent typical of developed economies.

The India housing finance market was valued at approximately USD 385 billion in 2024 and is projected to reach USD 2,669 billion by 2033, reflecting a compound annual growth rate of 24.1 per cent. This extraordinary trajectory is being shaped by the convergence of rapid

urbanisation – with over 35 per cent of India's population now residing in urban areas – a middle class estimated at 400 million people, and ambitious government programmes such as Pradhan Mantri Awas Yojana (PMAY), which has sanctioned affordable housing units for economically weaker sections across the country.^{[1][2]}

However, the structural challenge confronting lenders is profound. The traditional mortgage process in India has long been characterised by excessive documentation requirements, physical branch dependency, and subjective credit assessment practices that systematically exclude the very borrowers that affordable housing initiatives are designed to serve. Self-employed workers, agricultural labourers, and informal sector employees – who together constitute the majority of India's workforce –

routinely fail to meet conventional income verification criteria, creating a credit gap that has historically been insurmountable.

It is in this context that artificial intelligence has emerged as a transformative force. Globally, the AI for financial services market reached USD 36.36 billion in 2024 and is projected to exceed USD 190 billion by 2033. Adoption rates among mortgage lenders jumped from 15 per cent in 2023 to 38 per cent in 2024, signalling a decisive crossing of the threshold from experimental curiosity to enterprise-grade infrastructure. For India, this global wave carries particular significance: the combination of digital public infrastructure (Aadhaar, UPI, AA Framework), a large pool of financially underserved citizens, and a rapidly maturing fintech ecosystem creates ideal conditions for AI to drive inclusive mortgage growth.^[3]

This paper is structured as follows. Section 2 provides an overview of the Indian housing finance landscape. Section 3 examines specific AI applications across the mortgage lifecycle. Section 4 analyses the regulatory framework governing AI in lending. Section 5 addresses the challenges and risks inherent in AI adoption. Section 6 offers a forward-looking synthesis, and Section 7 concludes with policy recommendations.

2. The Indian Housing Finance Landscape

2.1 Market Structure and Key Players

India's housing finance market is characterised by a diverse lender ecosystem. Public-sector banks retained a 47.33 per cent market share in 2025, led by the State Bank of India (SBI), whose home-loan portfolio is guided to cross INR 10 trillion (approximately USD 120.5 billion) in FY26. Private banks, most notably HDFC Bank – whose merger with its parent HDFC Ltd created a formidable franchise – compete aggressively in the prime and near-prime segments through fast digital onboarding and instant AI-based pre-approvals. Housing Finance Companies (HFCs) and non-banking financial companies (NBFCs) have carved a distinct niche in

affordable housing and informal income segments, with fintech-enabled HFCs mining alternative data sources such as utility payments and GST returns to widen their credit funnels.^{[4][5]}

The digital transformation of the sector has been rapid and measurable. As of 2024, 92 per cent of housing finance applications are processed online, a dramatic leap from just 60 per cent in 2020. Leading housing finance companies have adopted digital tools for credit assessment, loan disbursement, and customer service, making the process faster and more efficient. Technology has become the decisive differentiator: early users of the Unified Lending Interface (ULI) report cost-to-income ratio reductions of 200 basis points and sanction-cycle compression to 72 hours.

2.2 The Affordable Housing Imperative

India faces a housing shortage estimated at 100 million units, with the majority of the deficit concentrated in the lower-income segment. The affordable housing finance market – typically defined as loans below INR 15 lakh – is valued at USD 3.9 billion in 2025 and projected to reach USD 16.5 billion by 2033 at a CAGR of 19.8 per cent. Affordable Housing Finance Companies (AHFCs) such as Aadhar Housing Finance, Aavas Financiers, and IIFL Home Finance have emerged as specialists in this segment, leveraging deep micro-market knowledge and tech-first operations to serve borrowers that conventional lenders overlook.^{[6][7]}

The government's commitment is codified in PMAY-Urban 2.0, which earmarks USD 536 billion through 2029 for affordable housing infrastructure. The scheme's Credit Risk Guarantee Fund allows lenders to extend sub-8 per cent rates to EWS and LIG borrowers by lowering capital charges. These policy tailwinds, combined with AI-driven underwriting innovation, are creating the conditions for a step-change in mortgage penetration among India's most financially vulnerable populations.

3. AI Applications Across the Mortgage Lifecycle

3.1 Intelligent Document Processing and Origination

Traditional mortgage origination drowns underwriters in paperwork: income certificates, tax returns, bank statements, property documents, and identity verification materials. In India, this challenge is magnified by the diversity of document formats across states and the prevalence of informal income documentation. AI-powered Intelligent Document Processing (IDP), combining Optical Character Recognition (OCR), Natural Language Processing (NLP), and computer vision, addresses this directly by automatically extracting, classifying, and validating data from unstructured documents. The technology can instantly flag inconsistencies – such as a pay stub showing employer information inconsistent with bank statement credits – that human reviewers might overlook.^[8]

India's homegrown fintech, Easiloan, provides an illustrative case study. Launched in 2021, its 'Easiloan Instant Match' platform – described as India's first AI-based home loan selection and recommendation engine – integrates with major lenders including HDFC Bank, ICICI Bank, SBI, and Bajaj Housing Finance. The platform's proprietary AI engine performs credit appraisal and analysis digitally before routing applications to partner banks, offering a 24x7 fully digital process from application to document collection. The result is a dramatic reduction in processing timelines and a significant expansion of lender reach into new customer segments.

3.2 AI-Driven Credit Scoring and Underwriting

The most consequential application of AI in Indian mortgage lending lies in credit assessment. Conventional credit scoring models – dependent on formal employment records, payslips, and credit bureau histories – have a structural blind spot: they are incapable of evaluating the creditworthiness of the 'thin-file' borrower, the individual with little or no formal

credit history who constitutes a large segment of India's population. AI-driven scoring engines address this by analysing alternative data sources: mobile phone usage patterns, utility payment histories, GST filing regularity, e-commerce transaction data, and social graph information. These models evaluate thousands of data points in a fraction of the time it takes for a human underwriter, helping lenders make faster, more accurate decisions while penetrating thin-file segments without compromising portfolio quality.^{[9][10]}

The quantitative impact is significant. AI-driven mortgage origination has been associated with up to a 50 per cent increase in mortgage origination volume, up to a 20 per cent reduction in mortgage defaults, and loan processing times that are 2.5 times faster than the industry average. Machine learning models trained on India-specific data can identify repayment risk patterns that traditional scorecards miss, such as seasonal income fluctuations among agricultural workers or the cash-flow dynamics of small business owners. This capability is not merely an operational convenience; it is the technological prerequisite for achieving the government's financial inclusion objectives.^[11]

3.3 Fraud Detection and Risk Management

Mortgage fraud represents a significant risk exposure for Indian lenders, encompassing identity fraud, income misrepresentation, property valuation manipulation, and increasingly sophisticated synthetic identity creation. AI-based fraud detection systems operate by establishing behavioural baselines and flagging anomalies in real time. Machine learning models can detect patterns – unusual deposit sequences in bank statements, inconsistencies between declared income and digital footprint, or abnormal property valuation patterns in specific micromarkets – that rule-based systems miss entirely.

Globally, the adoption of AI-powered fraud detection in mortgage lending has demonstrated measurable results: lenders using AI have reported a 29 per cent average decrease

in operational costs, with fraud-related losses forming a material component of those savings. A 2024 report from McKinsey confirmed that 60 per cent of financial institutions surveyed had already achieved measurable cost reductions and productivity gains from their AI initiatives, with fraud prevention consistently ranking among the highest-value use cases.^[12]

3.4 Customer Experience and Conversational AI

The borrower experience has historically been one of the weakest dimensions of Indian mortgage lending. Long queue times, opaque processes, and limited access to knowledgeable loan officers have created significant friction. AI-powered chatbots and virtual assistants – available 24×7 and capable of handling queries in multiple Indian languages – are transforming this dimension. These systems can answer eligibility queries, guide document submission, provide real-time loan status updates, and increasingly handle complex transactions including loan application initiation and rate locking. Many of India's top banks and NBFCs have deployed such conversational AI tools, dramatically improving first-contact resolution rates and reducing the burden on human loan officers.^[13]

3.5 Generative AI in Mortgage Processing

The emergence of generative AI (GenAI) represents the next frontier. While traditional AI and machine learning have been incorporated into mortgage technology for years, GenAI's ability to extract insights and automate processes connected with unstructured data is particularly relevant for the Indian mortgage context, where documentation often appears in non-standard formats, regional languages, and mixed media. GenAI can automate the preparation of underwriter-ready loan files, generate personalised product recommendations in vernacular languages, and streamline compliance documentation generation – capabilities that address specific bottlenecks in the Indian lending workflow.^[14]

4. The Regulatory Framework for AI in Indian Mortgage Lending

4.1 The Evolution of Digital Lending Regulation

The regulatory evolution governing AI-assisted lending in India has been rapid and significant. The Reserve Bank of India issued its foundational Digital Lending Guidelines in September 2022, establishing the first comprehensive regulatory framework for lending conducted through digital platforms. These guidelines introduced requirements for transparency in loan terms, consumer data protection, and accountability for AI-assisted decisions, making clear that outsourcing arrangements with technology providers do not diminish a lender's regulatory obligations. Subsequent clarifications in February 2023 and Default Loss Guarantee rules in June 2023 further refined the framework.^{[15][16]}

The regulatory landscape reached a new level of maturity with the issuance of the RBI (Digital Lending) Directions, 2025 on May 8, 2025. These Directions consolidate and replace the earlier frameworks and introduce several significant enhancements: strengthened requirements for multi-lender arrangements mandating transparent disclosure of all potential lenders, mandatory registration of all Digital Lending Apps through RBI's CIMS portal, and enhanced data privacy obligations explicitly aligned with the Digital Personal Data Protection Act (DPDPA) 2023. The 2025 Directions represent the RBI's considered response to the rapidly evolving digital lending landscape and establish a mature regulatory architecture for AI-assisted mortgage origination.^[17]

4.2 Explainability and Ethical AI Requirements

A central regulatory concern – and one that has direct implications for AI-driven credit assessment – is the requirement for explainability in lending decisions. India's regulatory framework, informed by international precedents, requires that lenders assume a 'duty of explanation' and ensure that outputs from AI algorithms are explainable, transparent, and fair. This obligation is operationalised in the RBI's Draft

'Regulatory Principles for Management of Model Risks in Credit' (2024), which mandates that model outcomes be 'consistent, unbiased, explainable and verifiable.' RBI officials have also noted in 2024 that overreliance on historical data may lead to inaccuracies in credit assessment, particularly in dynamic or evolving market conditions, and that AI cannot substitute for the credit officer's ultimate decision-making responsibility.^[18]

This regulatory posture has significant practical implications. Lenders deploying AI underwriting models in India must maintain model documentation sufficient to explain adverse credit decisions to both borrowers and regulators. The deployment of 'black box' machine learning models that cannot articulate the basis for a rejection is not merely commercially undesirable but legally impermissible. This has spurred investment in Explainable AI (XAI) architectures that generate transparent rationales for every loan decision alongside the decision itself.

5. Challenges and Risks in AI Adoption

5.1 Data Quality and the Infrastructure Challenge

The effectiveness of any AI model is fundamentally constrained by the quality, completeness, and representativeness of its training data. This presents a particular challenge in the Indian mortgage context, where formal data infrastructure has historically been incomplete. Credit bureau coverage, while expanding, does not capture the majority of India's working population. Property valuation databases are fragmented, with wide regional variation in data quality. Income documentation for the informal sector – the segment most underserved by conventional lending – is often either unavailable or non-standardised.

Lenders and fintechs have responded by developing alternative data strategies that draw on India's unique digital infrastructure. The Account Aggregator (AA) Framework, which enables consented sharing of financial data

from banks, tax authorities, and securities depositories, has significantly improved data availability. The integration of GST filing data, UPI transaction histories, and Aadhaar-verified income information has created new signal sources for AI models. However, the quality and representativeness of these alternative data sources vary significantly across borrower segments and geographies.

5.2 Algorithmic Bias and Fair Lending

A fundamental concern with AI-driven credit assessment is the potential for algorithmic bias – the systematic and unjustified disadvantaging of particular groups of borrowers based on correlated proxy variables. In the Indian context, this concern is amplified by the historical patterns of financial exclusion along lines of caste, religion, gender, and geography that are embedded in existing credit data. An AI model trained on historical approval and default data may learn to replicate and entrench these discriminatory patterns rather than correcting them.

The implications for India's financial inclusion agenda are direct and serious. If AI underwriting models systematically undervalue creditworthiness signals from rural, low-income, or socially marginalised borrowers, the technology that was meant to democratise mortgage access may instead create new forms of digital redlining. Responsible AI deployment requires proactive bias auditing, fairness constraint integration into model training, and ongoing monitoring for disparate impact across borrower demographics.

5.3 Data Privacy and Cybersecurity

Mortgage applications require the disclosure of highly sensitive personal and financial information. AI systems that process this data at scale create concentrated repositories of borrower information that represent attractive targets for cybercriminals and create significant privacy obligations under the Digital Personal Data Protection Act (DPDPA) 2023. The 2025 RBI Digital Lending Directions explicitly mandate

consent-based data collection, restrict the categories of mobile device data that lending apps can access, and require that data collection be need-based with explicit borrower consent and full audit trails. Lenders must navigate these obligations while maintaining the data access necessary for effective AI model training and operation.^[17]

5.4 Model Risk and Over-Reliance

AI models, however sophisticated, are not infallible. Model risk – the potential for systematic errors arising from flawed model design, inadequate training data, or unexpected distribution shifts – is a persistent concern in credit assessment. In the mortgage context, where individual loans may be held on balance sheet for 15-20 years, model errors can have long-tailed consequences. The RBI has explicitly warned that overreliance on AI algorithms in dynamic market conditions can lead to systematic credit assessment errors, and has emphasised the need for continuous model calibration and human oversight of AI-assisted underwriting decisions.

6. Forward-Looking Synthesis: AI and the Future of Indian Mortgages

6.1 AI as Financial Inclusion Infrastructure

The most profound long-term implication of AI in Indian mortgage lending is its potential to function as financial inclusion infrastructure – the technological bridge between formal credit markets and the hundreds of millions of households currently excluded from them. Looking ahead to 2035, India's mortgage penetration is expected to move toward 18-20 per cent of GDP, supported by better income tracking and deeper financial inclusion. This trajectory depends on AI-driven underwriting becoming sufficiently sophisticated to reliably assess the creditworthiness of thin-file, informal-sector, and rural borrowers – and doing so in a manner that is fair, transparent, and compliant with regulatory requirements.^[5]

The Unified Lending Interface (ULI), developed by the Reserve Bank Innovation Hub, represents a

significant architectural advance in this direction. By creating standardised APIs that allow lenders to access consented borrower data from multiple sources – banks, land records, GSTN, and others – ULI removes a key barrier to alternative data-driven credit assessment. Early adopters have reported dramatic reductions in approval times and cost-to-income ratios, with the technology enabling meaningful penetration into previously inaccessible borrower segments.

6.2 The Co-Lending Model and AI Orchestration

Co-lending arrangements – partnerships between banks and NBFCs or HFCs in which the bank provides low-cost liquidity while the fintech origination partner provides distribution reach and alternative credit assessment – are becoming a structural feature of Indian housing finance. AI plays an essential orchestration role in these partnerships: matching borrower profiles to optimal lending partners, integrating risk assessments from multiple data sources, ensuring regulatory compliance across the origination chain, and managing the data flows between partners in real time. The sophistication of this orchestration function is a key determinant of co-lending efficiency and scalability.

6.3 Recommendations for Responsible AI Adoption

Based on this analysis, the following recommendations are offered to policymakers, regulators, and lending institutions:

- Mandatory bias auditing: Regulators should require periodic independent audits of AI credit models for disparate impact across protected borrower characteristics, with results reported to the RBI.
- Explainability standards: The RBI's draft Model Risk Principles should be finalised and strengthened to require borrower-intelligible explanations for adverse credit decisions, not merely technical documentation for regulators.

- Data commons for inclusion: Government and industry should collaborate to develop consented, privacy-preserving data infrastructure that enables AI models to be trained on representative data covering informal sector workers and rural populations.
- Human oversight requirements: Regulatory guidance should specify minimum thresholds for human review in AI-assisted underwriting, ensuring that AI augments rather than replaces professional credit judgment.
- Regulatory sandboxes for fintech innovation: The RBI should expand its fintech sandbox programme specifically for AI mortgage innovations targeting underserved segments, allowing responsible experimentation before full-scale deployment.

7. Conclusion

The intersection of artificial intelligence and mortgage lending in India represents one of the most consequential applications of technology in the country's financial sector. The scale of the opportunity – a market projected to grow from USD 385 billion to nearly USD 2.7 trillion over the next decade, serving a population with profound unmet housing finance needs – is matched by the complexity of the challenge. AI offers genuinely transformative capabilities: the ability to assess creditworthiness without formal income documentation, to process applications in minutes rather than weeks, to detect fraud at scale, and to deliver personalised mortgage products to borrowers who have never had access to formal housing credit.

India's AI mortgage ecosystem is distinguished by several unique features: the foundational digital infrastructure of Aadhaar, UPI, and the Account Aggregator framework; the progressive and increasingly sophisticated regulatory architecture of the Reserve Bank of India; a diverse lender landscape that includes state-owned banks, private banks, housing finance

companies, and fintech-enabled NBFCs; and the enormous social urgency of the affordable housing mandate. These features create both the conditions and the imperative for AI adoption that is distinctive from the experience of developed mortgage markets.

However, the path to realising this potential is not without hazard. Algorithmic bias threatens to create new forms of digital exclusion rather than eliminating existing ones. Model opacity undermines borrower rights and regulatory accountability. Data concentration creates privacy and security risks that must be managed with rigour. The human element – the credit officer's contextual judgment, the loan officer's relationship with the borrower community – retains irreplaceable value in edge cases and complex credit situations.

Ultimately, the question confronting India's mortgage ecosystem is not whether to adopt AI but how to do so responsibly. The technology's potential to serve the country's financial inclusion ambitions – to put the aspiration of homeownership within reach of millions of families who have been systematically excluded from formal credit – makes this question not merely commercial or regulatory but deeply ethical. The architecture of responsible AI in Indian mortgage lending must be built with this imperative at its centre.

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