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# **DIGITAL TRANSFORMATION IN MORTGAGE LENDING: AN EVALUATION OF EMERGING TECHNOLOGIES AND THEIR LEGAL IMPLICATIONS**

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## **Abstract**

Mortgage lending is changing fast. Artificial intelligence now powers credit decisions. Automated models value properties. Blockchain and smart contracts are being tested for conveyancing. Digital signatures let borrowers close loans from their phones.

In India, the RBI's Digital Lending Directions, 2025 mark a major regulatory shift. They consolidate previous guidelines and introduce key requirements: mandatory Key Facts Statements, strict rules for Lending Service Providers, direct disbursement, data localization, cooling-off periods, and reporting of Digital Lending Apps.

But questions remain. How do we ensure AI does not discriminate? Who is liable when multiple lenders share a platform? Can global cloud providers comply with India's 24-hour data deletion rule? Are smart contracts enforceable under the Contract Act?

This paper examines the technological landscape of digital mortgage lending, analyzes the RBI's 2025 framework, and evaluates legal implications including algorithmic bias, automated valuations, data protection, and consumer rights. Through comparative analysis with the US, UK, and EU, it identifies regulatory gaps and proposes reforms.

**Keywords:** Digital Lending, Mortgage, Artificial Intelligence, RBI Digital Lending Directions 2025, Algorithmic Bias, Data Localization, Lending Service Providers, Smart Contracts, Consumer Protection

## 1. Introduction

The mortgage lending industry has always been paper-heavy, slow, and manual. Borrowers filled out stacks of forms. Lenders took weeks to verify documents. Property valuations required physical inspections. Closings meant sitting around a table signing dozens of pages. That world is disappearing.

Digital technologies are reshaping every stage of the mortgage process. AI now powers credit underwriting, analyzing income, spending patterns, and credit history in seconds. Automated valuation models estimate property prices without site visits. Blockchain and smart contracts are being tested to speed up conveyancing and reduce fraud. Digital signatures let borrowers close loans from their phones.

AI adoption in mortgage lending jumped from 15% in 2023 to 38% in 2024. This is not slow evolution. It is rapid transformation.

But technology moves faster than law. While lenders adopt new tools, regulators play catch-up. Legal frameworks written for a paper-based world do not always fit algorithms and automated systems.

India has become a laboratory for digital lending innovation. The RBI's Digital Lending Directions, 2025, effective from 8th May 2025, consolidate previous fragmented guidelines into a unified code.

These Directions are comprehensive. They cover who can lend, how technology partners are used, what data can be collected, how terms must be disclosed, and what happens when things go wrong. They require all borrower data to stay in India. They mandate a cooling-off period. They ban Lending Service Providers from collecting fees directly from borrowers.

But even this detailed framework leaves questions unanswered. How do you ensure an AI algorithm does not discriminate? What happens when a borrower cannot get an explanation for rejection? How do global cloud platforms comply with the 24-hour data deletion rule? Who is liable when multiple lenders share a platform?

This paper tries to answer these questions.

## 2. Objectives of the Study

- To examine the technological landscape of digital mortgage lending including AI in underwriting, automated valuations, blockchain, and electronic closing
- To analyze the RBI's Digital Lending Directions, 2025 and their key provisions
- To evaluate legal implications of algorithmic decision-making including fair lending compliance and algorithmic bias
- To examine regulatory treatment of Lending Service Providers and multi-lender arrangements
- To assess data protection and privacy implications including data localization
- To compare international approaches in the US, UK, and EU
- To evaluate consumer protection dimensions including disclosure and grievance redressal
- To suggest reforms addressing identified legal gaps

## 3. Methodology

This is a doctrinal study. I analyzed legal texts, regulations, and reports including the RBI's Digital Lending Directions, 2025, the Information Technology Act, 2000, the Digital Personal Data Protection Act, 2023, and the Bharatiya Sakshya Adhinyam, 2023.

For international comparison, I examined the US Equal Credit Opportunity Act, Fair Housing Act, the GAO's September 2025 report on property technology, UK parliamentary responses on tokenised deposits, and the EU's AI Act.

Secondary sources included analyses from Juris Corp, Obhan & Associates, SCC Times, Practical Law, and industry publications.

## 4. Literature Review

Recent regulatory scholarship and practitioner commentary highlight the consolidation and expansion of India's digital lending framework under the Digital Lending Directions, 2025 issued by the Reserve Bank of India. The 2025 Directions unify and supersede earlier instruments, including the 2022 Guidelines on Digital Lending and the 2023 Default Loss Guarantee (DLG) Framework, creating a comprehensive regime applicable to commercial banks, cooperative banks, NBFCs (including housing finance companies), and All-India

Financial Institutions (Reserve Bank of India, 2025; Juris Corp, 2025). Commentary by Juris Corp notes that regulated entities retain full accountability for Lending Service Providers (LSPs), even where lending is operationally outsourced, and must ensure compliance in multi-lender digital platforms, including neutral presentation of loan offers and prohibition of manipulative interface design. Borrower-protection safeguards include a mandatory Key Facts Statement, cooling-off periods, enhanced grievance redress mechanisms, and reporting obligations through the Centralised Information Management System (CIMS) (Reserve Bank of India, 2025). Obhan & Associates (2025) observe that while the Directions attempt to balance innovation with accountability, significant compliance challenges remain, particularly regarding the 24-hour overseas data processing limit and strict localization requirements.

Concerns about algorithmic decision-making in lending are widely documented in comparative literature. A September 2025 report by the United States Government Accountability Office finds that property technology and AI-enabled lending tools pose risks of reinforcing historical bias, especially where algorithms are trained on legacy datasets reflecting discriminatory patterns (GAO, 2025). The report highlights risks associated with automated underwriting, valuation models, and chatbot-driven consumer interactions. US regulatory commentary further identifies issues of “algorithmic bias,” artificial intelligence in credit models, and “digital redlining” (Practical Law, 2025). By contrast, although the RBI’s 2025 Directions require audit trails and impose responsibility on regulated entities, they do not expressly mandate algorithmic explainability, bias testing, or disparate impact analysis (Reserve Bank of India, 2025), leaving a gap in formal oversight of AI-driven credit scoring and automated decision systems.

On data protection and cross-border data governance, legal analysis emphasizes that the localization mandate in the 2025 Directions is designed to ensure regulatory access and data sovereignty (SCC Times, 2025). However, commentators note operational constraints: global cloud service providers may not technically guarantee deletion within 24 hours, and cross-border transactions involving non-resident borrowers may require extended processing timelines. The Directions also significantly strengthen consent architecture, restricting Digital Lending Apps from accessing mobile phone resources except for one-time KYC verification, and granting borrowers rights to restrict sharing, revoke consent, and request deletion (Reserve Bank of India, 2025).

Internationally, policy developments reflect growing scrutiny of technology-enabled financial systems. In January 2026, the HM Government indicated that decisions concerning tokenised deposits and smart contracts remain independent commercial matters for lenders and property firms, although ongoing reviews are examining how digital tools may improve home-buying processes (HM Government, 2026). Meanwhile, the GAO has recommended that the Federal Housing Finance Agency provide written guidance clarifying fair lending compliance expectations in automated underwriting and valuation contexts (GAO, 2025).

Taken together, the literature reveals five principal research gaps: (1) limited regulatory focus on algorithmic transparency and bias mitigation in digital lending; (2) unresolved liability allocation in multi-lender platform arrangements; (3) insufficient integration between digital lending regulation and property law systems; (4) practical and doctrinal tensions in cross-border data governance; and (5) the absence of empirical enforcement analysis under the consolidated 2025 regime. This paper addresses the first four gaps through doctrinal, comparative, and policy analysis.

## **5. The Technological Landscape**

### **5.1 Artificial Intelligence in Underwriting**

How much do we really know about the algorithms deciding whether we get a loan? The unsettling answer: not nearly enough.

The shift to automated underwriting is one of the biggest changes in modern lending. AI systems now digest spending habits, transaction histories, browsing behaviour, and sometimes social media activity—all in seconds. Decisions that took days happen while you wait. For banks, this means lower costs. For borrowers, it means faster access to credit and, in theory, inclusion for those without traditional financial histories.

But there is a darker side. AI learns from historical data, and historical data carries the weight of past discrimination. If a model learns from lending decisions made when certain communities were systematically denied credit, it will faithfully reproduce those patterns—not out of malice, but because that is what the data teaches. A bank with no intention to discriminate can end up doing exactly that, simply by automating its past practices.

Then there is the "black box" problem. Many machine learning models are so complex that even their creators cannot fully explain why a particular decision was reached. So when a borrower is denied credit and asks why, what does the lender say? "The algorithm decided" is not an answer that satisfies any notion of fairness, yet increasingly, it is the only answer available.

The RBI's Digital Lending Directions, 2025 require audit trails and hold regulated entities responsible (Reserve Bank of India, 2025). But as Obhan & Associates (2025) note, the Directions do not mandate algorithmic explainability, bias testing, or disparate impact analysis. A lender can deploy automated systems without ever checking whether they systematically disadvantage particular groups. The rules demand accountability on paper, but not transparency where it matters most—inside the algorithm itself.

## 5.2 Automated Valuation Models

How much is a property worth? For most of history, the answer came from a valuer who walked through the rooms and applied their judgment. Today, increasingly, the answer comes from an algorithm.

Automated Valuation Models estimate property values using data on recent sales, property features, and market trends. They are fast and cheap. In India, where physical verification is often impractical, the appeal is obvious.

But speed means little if the answer is wrong. Indian property records are often incomplete or outdated. Many transactions involve under-reporting of sale consideration to reduce stamp duty, so the recorded price does not reflect actual market value. An AVM trained on this data learns to reproduce these distortions, hiding inaccuracies behind an appearance of mathematical precision.

Geographic bias is another concern. AVMs work well where data is abundant—typically cities with formal property markets. In rural areas or urban peripheries, where data is sparse, the models perform poorly. Borrowers from data-poor areas get systematically worse service than those from data-rich neighbourhoods. Not bias by design, but bias in effect.

The US GAO (2025) has documented how AVMs can disadvantage certain communities where historical patterns have created uneven data landscapes. India's spatial inequalities are at least as pronounced, and its property records far more fragmented. Yet the 2025 Directions say nothing about valuation technology. Lenders can deploy AVMs with no standards for accuracy, no bias testing, no geographic coverage requirements. The technology that decides what your home is worth operates entirely in the shadows.

### **5.3 Blockchain and Smart Contracts**

Imagine buying a home where the deposit moves as a digital token, the contract executes itself automatically, and title transfer happens simultaneously with payment—all recorded on an immutable ledger. For anyone who has endured Indian conveyancing, this sounds like a dream. Smart contracts could release funds the moment registration is confirmed, update land records without manual intervention, and manage repayments through automated deductions. Tokenised deposits could replace cumbersome instruments, moving value instantly and securely.

But dreams meet reality, and reality is built on law. The Indian Contract Act, 1872 requires a meeting of minds, lawful consideration, and certainty of terms. Does code satisfy these requirements? The Stamp Act, 1899 was written for paper documents, not digital tokens. No amendment addresses how stamp duty applies to a tokenised transfer. The Registration Act, 1908 mandates registration of documents affecting immovable property, but does not recognise blockchain as a register. Until these questions are answered, blockchain remains a solution without a legal home.

Other countries are further ahead. The HM Government (2026) review shows the UK actively examining how digital tools might improve home-buying while maintaining legal certainty. India has not yet begun this conversation. The 2025 Directions are silent on blockchain and smart contracts, leaving innovators to navigate uncertainty alone.

### **5.4 Electronic Closing**

Signing digitally, notarising remotely, paying online, registering without visiting a government office—parts of this vision are already here. The IT Act, 2000 gives legal recognition to electronic signatures and records. The Bharatiya Sakshya Adhinyam, 2023 goes further, treating electronic records as primary evidence.

But the gap between law on books and law on ground remains wide. Acceptance of digital signatures by sub-registrars varies enormously. Some offices have fully digitised; others insist on physical presence and ink. A borrower in one district can close entirely online; another a few kilometres away must take time off work and wait in line. This patchwork undermines the promise of technology.

Authentication questions also linger. If a digital signature is challenged years later, what standards of proof apply? The BSA, 2023 says electronic records are primary evidence, but does not address verifying signatures executed long ago or across jurisdictional lines. The law has opened a door, but not shown how to walk through it.

### **5.5 Lending Service Providers**

If you have applied for a loan through an app, you have encountered a Lending Service Provider. These entities run the apps, acquire customers, process applications, and manage communications. For banks, LSPs are a way to reach borrowers without building their own technology. For borrowers, LSPs are the face of lending.

The 2025 Directions regulate LSPs indirectly. Regulated entities remain fully responsible for everything LSPs do on their behalf (Reserve Bank of India, 2025). If an LSP misleads a borrower or collects excessive data, the bank bears the consequences. This principle of extended accountability makes sense: it prevents lenders from outsourcing their way out of responsibility.

But practice is more complicated, especially with multiple lenders. Digital platforms increasingly aggregate loan offers from various banks, presenting them through a single interface. If that interface is manipulative—steering borrowers toward certain lenders without disclosure—which lender is liable? The Directions say regulated entities are accountable, but when multiple entities are involved, all could face liability for the same failure. Juris Corp (2025) notes the Directions require neutral presentation and prohibit manipulative design, but do not specify how liability should be allocated. The ambiguity creates uncertainty, and uncertainty often means accountability dissolves rather than crystallises.

## 6. The Regulatory Framework in India

### 6.1 Evolution Before 2025

The story of India's digital lending regulation is one of gradual realisation—a slow awakening to the fact that technology had fundamentally changed lending, and the rules needed to change with it.

In 2020, the RBI issued its first guidelines on loans sourced over digital platforms. It was a modest beginning, focused mainly on transparency between banks and the platforms bringing them customers. But digital lending was evolving faster than the rules could keep up. By 2022, the RBI issued more comprehensive Guidelines on Digital Lending, responding to growing concerns about unfair practices, excessive interest rates, and borrower harassment. Then came the Default Loss Guarantee frameworks in 2023 and 2024, addressing arrangements where platforms guaranteed to cover some portion of loan losses. A circular on the Key Facts Statement followed in 2024, requiring lenders to present loan terms in a simple, standardised format.

Each instrument addressed specific problems, but together they created a fragmented framework. A lender operating across multiple product lines might face different requirements for different activities, with no single document bringing everything together. The 2025 Directions changed that. They consolidated and unified the entire body of digital lending regulation into one comprehensive instrument.

### 6.2 The RBI's Digital Lending Directions, 2025

Effective from 8th May 2025, the Directions apply to all entities regulated by the Reserve Bank of India—commercial banks, cooperative banks, NBFCs (including housing finance companies), and All-India Financial Institutions. They represent the most complete statement yet of what the regulator expects from digital lending.

#### Lending Service Providers

The Directions make clear that regulated entities cannot wash their hands of responsibility by outsourcing to LSPs. Every LSP must operate under a written contract. The regulated entity must conduct due diligence before onboarding and monitor performance continuously. Most importantly, the regulated entity remains fully accountable for everything the LSP does on its

behalf. If an LSP mistreats a borrower, the bank bears the consequences. This principle of extended accountability is the bedrock on which the entire LSP framework rests.

### **Multi-Lender Arrangements**

Digital platforms increasingly aggregate loan offers from multiple lenders. The Directions require that these offers be displayed impartially, with no steering toward particular lenders and no manipulative interface design. The prohibition on "dark patterns"—design choices that trick users—is significant. Each lender remains individually responsible for its compliance. If a platform's design misleads borrowers, every lender on that platform could face regulatory action.

### **Borrower Protection**

At the heart of the Directions is a set of protections giving borrowers more control and information. Every loan must have a Key Facts Statement showing interest rate, fees, repayment schedule, and all key terms in a format borrowers can actually understand. Disbursement must go directly to the borrower's bank account; repayments must come directly from it, with no money passing through the LSP. A cooling-off period of at least one day gives borrowers time to change their minds. LSPs cannot collect fees directly from borrowers; all charges must be paid by the regulated entity. These provisions ensure that borrowers know what they are getting into and retain control over the process.

### **Data Governance**

The data provisions are among the most detailed. All borrower data must be stored in India. Overseas processing is permitted only in limited circumstances and must be completed within 24 hours, after which data must be deleted from foreign servers. Digital Lending Apps cannot access mobile phone resources—contacts, gallery, location, microphone—except for one-time KYC verification, and even that requires explicit consent. Borrowers have the right to restrict data sharing, revoke consent, and request deletion. These provisions reflect a growing recognition that data carries privacy implications that must be respected.

### **Reporting of Digital Lending Apps**

All Digital Lending Apps used by regulated entities must be reported through the Centralised Information Management System. The chief compliance officer of each regulated entity must

certify compliance. This creates a clear chain of responsibility and ensures the regulator knows which apps are operating in the market.

### **6.3 Interaction with Other Laws**

The Directions do not exist in isolation. They operate within a broader legal framework.

#### **The Information Technology Act, 2000**

The IT Act provides the foundational infrastructure for digital transactions. It gives legal recognition to electronic signatures and electronic records, making it possible to execute loan agreements entirely online. Without it, digital lending could not exist.

#### **The Digital Personal Data Protection Act, 2023**

The DPDP Act establishes a comprehensive framework for data protection, centred on data principal rights and fiduciary obligations. The Directions' provisions on consent, data storage, and borrower rights must be read consistently with the DPDP Act. In some areas, the Directions go further; in others, they provide sector-specific implementation.

#### **The Bharatiya Sakshya Adhiniyam, 2023**

The BSA modernises evidence law, treating electronic records as primary evidence. This is crucial for digital lending, where loan agreements, repayment records, and communications exist only in electronic form. If disputes arise, lenders need to rely on these records in court. The BSA provides that assurance.

#### **The Indian Contract Act, 1872**

Every loan is a contract, and every contract must satisfy the Contract Act's requirements—meeting of minds, lawful consideration, certainty of terms. The Directions do not change this. They add regulatory requirements on top of the contractual framework, but do not replace it. A loan that complies with the Directions but fails Contract Act requirements is still unenforceable.

#### **Property Laws**

Here the picture becomes more complicated. The Transfer of Property Act, 1882 governs interests in immovable property. The Registration Act, 1908 requires registration of documents affecting immovable property. State stamp acts impose duty on transfer instruments. These

laws were written for a paper world, and their application to digital transactions is not always clear. A mortgage created through a digital lending platform must still satisfy these requirements, which vary from state to state and have not been fully harmonised with the digital framework. This is where the elegant structure of the Directions meets the messy reality of Indian property law, and the fit is not always comfortable.

## 7. Algorithmic Decision-Making and Fair Lending

At its core, fair lending is a simple idea with profound implications: people should be judged on their own merits, not on who they are or where they come from. In India, this principle flows from Articles 14 and 15 of the Constitution, guaranteeing equality before the law and prohibiting discrimination on grounds of religion, race, caste, sex, or place of birth. In the United States, the Equal Credit Opportunity Act and the Fair Housing Act embed similar protections, requiring that credit decisions be made without regard to race, colour, religion, national origin, sex, marital status, age, or reliance on public assistance. These laws reflect a shared understanding: access to credit shapes access to opportunity, and if lending is discriminatory, the harm ripples outward through every aspect of life.

The problem is that algorithms do not naturally understand or respect these principles. An AI model trained on historical lending data learns whatever patterns exist in that data, including patterns of discrimination. If a bank denied loans to certain communities in the past—whether through explicit policy, unconscious bias, or the accumulated effect of structural inequality—the algorithm will faithfully reproduce those denials. It will learn that applicants from certain areas are "higher risk" not because of any actual correlation with creditworthiness, but because historical data reflects past exclusion. This is not bias in the sense of malicious design; it is bias baked into the system, invisible to the lender and the borrower alike.

Then there is the problem of proxy discrimination. An algorithm barred from using caste or religion directly can still achieve the same result by using factors that correlate closely with those characteristics—pin code, surname, educational institution, even spending patterns. The discrimination is no less real for being indirect. And feedback loops amplify the damage. If an algorithm denies credit to people in a particular area, those people cannot build credit histories. Future algorithms, trained on data that excludes them, will continue to deny them. A single discriminatory pattern, once encoded, becomes self-perpetuating.

The opacity of modern AI compounds these risks. A human loan officer, asked why they denied an application, can give an answer: the income was too low, the credit score too poor, the employment history too short. The answer may be wrong, but it is an answer, capable of being questioned and challenged. An AI model often cannot explain itself. The "black box" problem means that even the engineers who built the system may not know why it reached a particular decision. So when a borrower is denied credit and asks why, the lender has nothing to offer. The borrower cannot challenge an explanation that does not exist. Regulators cannot monitor compliance with fair lending laws if they cannot see how decisions are made. The algorithm operates in shadow, and everyone else is left in the dark.

This is where the 2025 Directions fall short. For all their detail on data governance, borrower protection, and LSP accountability, they say almost nothing about algorithmic fairness. There is no requirement to test lending algorithms for disparate impact—to ask whether they systematically disadvantage particular communities. There is no requirement to provide borrowers with explanations when automated systems deny them credit. There are no standards for validating algorithms before deployment, no guidance on how to ensure that AI systems comply with fair lending principles. A lender can deploy a fully automated underwriting system, never test it for bias, deny loans to entire communities, and still be in technical compliance with the Directions. The framework demands accountability in form but ignores it in substance.

Other countries have begun to grapple with these questions more directly. The European Union's AI Act classifies credit scoring as a high-risk AI system, subjecting it to rigorous requirements: risk assessment, technical documentation, transparency obligations, and human oversight. Before deployment, these systems must be tested for bias and discrimination. Throughout their operation, they must be monitored for compliance. The approach recognises that if algorithms are going to make consequential decisions, they must be held to standards that match the significance of those decisions.

In the United States, the Consumer Financial Protection Bureau has made clear that adverse action notices—the explanations lenders must provide when denying credit—are required regardless of whether the decision was made by a human or an algorithm. The law does not care how the decision was reached; it cares that the applicant receives a meaningful explanation. This seemingly simple requirement has profound implications for AI lending. If

an algorithm cannot explain itself, perhaps it should not be making decisions alone.

The United Kingdom's Financial Conduct Authority takes a similar stance, requiring that AI systems deliver fair outcomes for consumers. The emphasis is on results, not process. A lender can use whatever technology it chooses, but it remains responsible for ensuring that the technology does not produce unfair or discriminatory outcomes.

India could learn from these approaches. The 2025 Directions represent significant progress in regulating digital lending, but they leave a gap where algorithmic fairness should be. Closing that gap does not require abandoning AI or returning to manual underwriting. It requires recognising that technology does not absolve lenders of their fundamental obligations. Borrowers denied credit deserve explanations. Communities affected by algorithmic discrimination deserve recourse. Regulators tasked with enforcing fair lending laws deserve visibility into how decisions are made. These are not radical demands; they are the minimum requirements of a system that takes fairness seriously. Until the framework addresses them, the promise of algorithmic lending will remain shadowed by the risk of algorithmic harm.

## **8. Automated Valuation Models and Property Valuation**

### **8.1 The Role of Valuation**

Before a lender parts with money, they need to know one thing with reasonable certainty: the property being offered as security is worth more than the loan being sought. This is the bedrock of secured lending. If a borrower defaults, the lender should be able to sell the property and recover what they are owed. Get the valuation wrong, and the entire calculation collapses.

Traditionally, this meant a physical inspection by a qualified valuer—someone who would visit the property, walk through each room, note its condition, compare it with similar properties in the neighbourhood, and apply their professional judgment. The valuer's signature at the bottom of a report carried weight because it represented personal expertise and accountability. If the valuation was negligent, the valuer could be pursued.

That world is fading. Today, increasingly, the valuation comes not from a person who visited the site, but from an algorithm that never left the server.

### **8.2 How Automated Valuation Models Work**

Automated Valuation Models, or AVMs, estimate property values using data. Lots of data. They crunch information on recent sales in the area, property characteristics like size and age,

neighbourhood trends, and broader market movements. In seconds, they produce a number that might have taken a human valuer days to arrive at.

The advantages are obvious. AVMs are fast—useful when lenders are processing thousands of applications. They are cheap—no valuer fees, no travel costs, no waiting for appointments. In a country like India, where property transactions are numerous and physical verification is often impractical, the appeal is undeniable.

But speed and cost mean little if the answer is wrong.

### **8.3 The Risks**

#### **Data Quality**

Indian property records are not always reliable. They are frequently incomplete, sometimes outdated, and often inconsistent across jurisdictions. Worse, a significant proportion of real estate transactions involve under-reporting of the sale consideration to reduce stamp duty liability. The price recorded on paper does not reflect the actual market value. An AVM trained on this data learns to reproduce these distortions. It becomes systematically inaccurate, but its inaccuracies are hidden behind an appearance of mathematical precision. The algorithm looks scientific, but it is only as good as the garbage fed into it.

#### **Geographic Bias**

AVMs perform well where data is abundant—typically in cities with formal property markets and reliable records. In rural areas, on the urban periphery, or in neighbourhoods where transactions are fewer, data is sparse. The models perform poorly there. If an AVM has less information about a particular area, its valuations for properties in that area will be less accurate. Borrowers from those areas are not just getting a rough estimate; they are getting a systematically worse service than borrowers from data-rich neighbourhoods. This is not bias by design, but it is bias in effect, and it has real consequences for who gets loans and on what terms.

#### **Model Risk**

Not all AVMs are created equal. Different models, using different algorithms and different datasets, can produce significantly different values for the same property. Which one is right? Without standards, lenders can pick the valuation that suits them—perhaps the lowest to be safe, perhaps the highest to make the loan work. The borrower has no way of knowing, and no way of challenging.

## **Bias and Discrimination**

The US Government Accountability Office has documented how AVMs can systematically disadvantage certain communities, particularly where historical patterns of redlining or segregation have created uneven data landscapes. India's spatial inequalities are at least as pronounced. If an AVM consistently undervalues properties in certain areas—whether because of data gaps, historical patterns, or model design—borrowers in those areas will find it harder to get loans, or will get loans on worse terms. This is discrimination baked into the technology, invisible and unchallengeable.

### **8.4 The Regulatory Gap**

Registered valuers in India are regulated under the Companies Act, with qualifications, codes of conduct, and disciplinary mechanisms. But these provisions were designed for humans, not algorithms. When a human valuer makes a mistake, you know who to pursue. When an AVM produces a wrong valuation, who is liable? The lender who used it? The company that developed it? The data provider whose faulty information fed into it? The law does not say.

This matters because the entire lending framework depends on accurate valuation. The RBI's loan-to-value guidelines—which cap how much a lender can advance against a property—assume that the underlying valuation is reliable. If valuations are systematically inaccurate, those guidelines become meaningless. Yet the Directions are silent on AVMs. Lenders can deploy them with no standards for accuracy, no validation requirements, no disclosure obligations, and no liability framework.

### **8.5 What Needs to Change**

None of this means AVMs should be abandoned. They offer real benefits, and with proper safeguards they can serve borrowers and lenders well. But safeguards are needed.

First, validation standards. Before an AVM is deployed, it should be tested against actual sales data to ensure it produces accurate results. This testing should be ongoing, not a one-time exercise.

Second, geographic coverage requirements. Lenders should be required to monitor where their AVMs perform poorly and take corrective action. If a model cannot value properties in certain areas reliably, it should not be used there, or its limitations should be disclosed.

Third, disclosure. Borrowers should be told when a valuation has been done by an algorithm rather than a human. They should have the right to understand how the valuation was arrived at, at least in general terms.

Fourth, a right to challenge. If a borrower believes an AVM valuation is wrong, there should be a clear pathway to dispute it and obtain a human revaluation.

Fifth, clear liability allocation. The law should specify who is responsible when an AVM valuation is negligent or discriminatory. Leaving this ambiguity to be resolved case by case, through litigation, serves no one except lawyers.

Valuation is not a technical sideshow in lending. It is foundational. If we get it wrong, everything built on top of it is unstable. The technology has changed, but the law has not caught up. It needs to.

## **9. Blockchain, Smart Contracts, and Conveyancing**

Blockchain and smart contracts could revolutionise property transactions in India. Imagine tokenised deposits moving instantly without bank drafts, title records stored on distributed ledgers that cannot be tampered with, and smart contracts that automatically release funds the moment registration is confirmed. For anyone who has endured the delays and paperwork of Indian conveyancing, this sounds like a dream. But dreams collide with legal reality. The Indian Contract Act, 1872 requires a meeting of minds, lawful consideration, and certainty of terms. Does code satisfy these requirements? Can a smart contract be said to reflect the intentions of the parties in the way the Act contemplates? The Stamp Act, 1899 was written for paper documents, not digital tokens. No amendment has addressed how stamp duty applies to a tokenised transfer, or whether duty is even payable on something that exists only on a distributed ledger. The Registration Act, 1908 mandates registration of documents affecting immovable property, but it does not recognise blockchain as a register. Until these questions are answered, blockchain remains a solution without a legal home. Other countries are further ahead. The United Kingdom is actively reviewing how digital tools might improve home-buying while maintaining legal certainty. Singapore has legislated to recognise electronic transactions including smart contracts. India has not yet begun this conversation. The 2025 Directions are silent on blockchain and smart contracts, leaving innovators and lenders to navigate uncertainty alone. Widespread adoption will remain unlikely until the legal position is clarified, and that clarification requires legislative action that has not even been proposed.

## **10. Data Protection and Privacy**

The 2025 Directions contain some of the most detailed data protection provisions ever applied to Indian lending. All borrower data must be stored in India. Overseas processing is permitted

only in limited circumstances and must be completed within 24 hours, after which the data must be deleted from foreign servers. Digital Lending Apps cannot access mobile phone resources—contacts, gallery, location, microphone—except for one-time KYC verification, and even that requires explicit consent. Borrowers have the right to restrict sharing of their data, to revoke consent previously given, and to request deletion. On paper, these are strong protections. But paper meets reality, and reality is messy. The 24-hour deletion requirement assumes that global cloud platforms can guarantee deletion within that timeframe. Many cannot. Cloud providers replicate data across multiple servers in multiple locations with multiple backups. Ensuring that every copy is deleted within 24 hours is technically difficult, sometimes impossible. Cross-border transactions create another complication. If a non-resident Indian borrows from an Indian lender while living abroad, their data will necessarily be processed overseas. The 24-hour rule does not account for this reality. Then there is enforcement. The Directions say what must happen, but they do not say what happens when it does not. The Digital Personal Data Protection Act, 2023 establishes a comprehensive framework for data protection, but it does not contain a 24-hour deletion requirement. Which prevails? The answer is not clear. What is needed is clarity: that the 24-hour rule applies to active processing, not passive storage; that exceptions with safeguards exist for legitimate contexts; and that enforcement mechanisms are strong enough to give borrowers meaningful remedies when their data is mishandled.

## **11. Consumer Protection**

At the heart of the Directions is a simple idea: borrowers should know what they are getting into. Every loan must be accompanied by a Key Facts Statement—a standardised document showing the interest rate, fees, repayment schedule, and all key terms in a format borrowers can actually understand. Digitally signed loan documents must be automatically sent to borrowers. No more hiding important information in fine print. Borrowers also get at least one day to change their minds. If they sign a loan agreement and then have second thoughts, they can exit without penalty within this cooling-off period. Loans must be disbursed directly to the borrower's bank account. Repayments must go directly to the regulated entity. No money passes through the LSP. LSP fees must be paid by the regulated entity, not deducted from the loan amount. These are genuine improvements that address real problems borrowers have faced for years. But limitations remain. For mortgage products, one day may be insufficient. A home loan is the largest financial commitment most people ever make. The terms are complex, the implications far-reaching. One day is not enough to properly consider whether

you have made the right decision. Every regulated entity and LSP must have a nodal officer to handle complaints. If the entity does not resolve the complaint, borrowers can escalate to the RBI's Complaint Management System. The structure is sound, but effectiveness depends on implementation. If nodal officers are hard to reach, if responses are slow, if escalations disappear into bureaucratic black holes, the framework will fail. The Directions provide for regulatory action when entities fail to comply, but they do not specifically address civil liability or compensation for borrowers who suffer harm. A clearer compensation framework would better serve consumers.

## 12. Comparative Analysis

Other countries have grappled with the same questions India now faces, and their experiences offer valuable lessons. The United States has a complex regulatory architecture where the Consumer Financial Protection Bureau, Federal Housing Finance Agency, and other agencies share responsibility. The Equal Credit Opportunity Act and Fair Housing Act prohibit discrimination in lending regardless of whether the decision is made by a human or an algorithm. The CFPB has made clear that adverse action notices—explanations when credit is denied—are required for automated decisions just as they are for human ones. A recent GAO report highlights the risks of property technology, including automated valuation models that may disadvantage certain communities. The United Kingdom takes a different approach. The FCA's Consumer Duty requires firms to deliver good outcomes for consumers, focusing on results rather than prescriptive rules. The government is reviewing property transactions, examining how digital tools might improve home-buying while maintaining legal certainty. The European Union has taken the most stringent approach. The AI Act classifies credit scoring algorithms as high-risk AI systems, subject to rigorous requirements: risk assessment, technical documentation, transparency obligations, and human oversight. Before deployment, these systems must be tested for bias. Throughout their operation, they must be monitored for compliance. The GDPR provides additional protection, including rights to explanation for automated decisions. For India, the lessons are clear. Algorithmic transparency requirements must be strengthened. Independent oversight is essential. Consumer rights need enhancement. Regulations should be technology-neutral, focusing on outcomes rather than specific tools. And lending regulation must be coordinated with property laws to ensure that digital mortgages actually work.

### 13. Findings and Recommendations

The 2025 Directions represent significant progress in regulating digital lending. They consolidate previously fragmented instruments into a single comprehensive document. They strengthen data governance, enhance consumer protection, and establish clear accountability for Lending Service Providers. This is genuine achievement. But significant gaps remain. Algorithmic transparency is almost entirely unaddressed. The Directions do not require disparate impact testing for lending algorithms. They do not require explanations when automated systems deny credit. They do not mandate human oversight of high-risk AI. A lender can deploy a fully automated system, never test it for bias, deny loans to entire communities, and still be in technical compliance. LSP liability is clear in principle but ambiguous in multi-lender arrangements. When multiple lenders are involved and a platform's design misleads borrowers, it is unclear how liability should be allocated. Automated Valuation Models operate without standards or oversight. There are no validation standards, no geographic coverage requirements, no disclosure obligations, no liability framework. Geographic bias risks systematically disadvantaging borrowers from data-poor areas. Blockchain and smart contracts face legal uncertainty. No legislative action has addressed how these technologies fit within the Contract Act, stamp duty laws, or registration requirements. Consumer protection is strengthened but has limitations. The one-day cooling-off period may be insufficient for mortgage products, and remedies for violations are not clearly specified. What is needed is action on multiple fronts. Strengthen algorithmic transparency through disparate impact testing and explanations for adverse decisions. Clarify multi-lender liability with guidance on allocation. Address data localization practicalities by clarifying that the 24-hour rule applies to active processing. Establish AVM validation standards including accuracy testing and geographic coverage requirements. Clarify the legal status of blockchain and smart contracts through legislative action. Strengthen consumer protection with extended cooling-off periods for mortgages and a clear compensation framework. Harmonise the Directions with other laws including the DPDP Act and property legislation. Build regulatory capacity to monitor algorithmic lending and enforce compliance actively. The technology has changed lending forever. The law must now catch up.

### 14. Conclusion

Digital transformation in mortgage lending is here. AI decides who gets loans. Automated models value properties. Blockchain is tested for conveyancing. Borrowers close loans from

phones.

Benefits are real: faster processing, lower costs, wider access. But risks are real too: algorithmic discrimination, inaccurate valuations, data misuse, loss of transparency.

India's RBI Digital Lending Directions, 2025 are comprehensive and thoughtful. They address LSP regulation, data governance, consumer protection, and reporting. They balance innovation with accountability.

But gaps remain. Algorithmic transparency is not addressed. Multi-lender liability needs clarity. The 24-hour data localization rule creates practical challenges. AVM validation standards are lacking. Blockchain and smart contracts exist in legal uncertainty.

Filling these gaps requires ongoing attention from regulators, legislators, and courts. It requires learning from international experience while adapting to Indian conditions. It requires balancing technological promise with rights protection.

The goal should be a framework where digital lending serves borrowers efficiently without compromising fairness, privacy, or access to justice. Where algorithms decide but humans oversee. Where innovation thrives but rights are protected.

Technology will keep evolving. The law must keep pace. The gap between them must not be filled by those who suffer when things go wrong.

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