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## **Banking Law And Technological Innovation: Regulatory Challenges, Digital Transformation And The Future Of Financial Governance**

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### ***Abstract***

*The banking sector is a key part of any country's economy. How well it develops depends on the services it offers to its customers. With changing customer needs, banks are constantly improving their services to stay competitive. The banking industry has seen major changes because of new technologies like ATMs, debit cards, credit cards, check truncation systems, NEFT, RTGS, mobile banking, internet banking, and cash deposit machines. Just like technology has advanced in other areas, the banking sector has also evolved. In India, new products and services have been introduced to meet the growing needs of customers. We will look at all the changes that have taken place in the banking industry. These innovative products help to strengthen the country's economy.*

***Keywords: Banking Law, Financial Innovation, Digital Banking, Fintech Regulation, Cryptocurrency Law, Open Banking, PSD2, RBI Regulation, Digital Lending, Algorithmic Governance, RegTech, ESG Banking, Blockchain, Financial Inclusion, Cybersecurity Compliance***

## INTRODUCTION

The banking industry has changed a lot in the last few decades because of fast technological progress, the global spread of financial markets, changing what customers want, and more complicated rules. In the past, banks mainly acted as middlemen by taking in deposits and giving out loans. But now, banks offer a wide range of financial services and products that are constantly being improved. These changes have significantly impacted how banks operate, presenting both challenges and opportunities for banking laws to address. New banking products are innovations, such as financial tools, services, processes, or methods of delivering services, that are either brand new or have undergone significant improvements. These products are made to make banking more efficient, easier to use, more profitable, and better for customers. Examples include online banking, mobile payments, ATMs, internet transfers, credit and debit cards, financial derivatives, packaged assets, services from fintech companies, and financial products using blockchain technology. While these new products help more people access financial services and make banking operations more efficient, they also bring up new legal and regulatory issues that banking laws need to handle.

When banks introduce new products, they face several legal problems, such as following the rules for operating a bank, meeting safety and soundness standards, protecting customer data and privacy, dealing with cybersecurity threats, ensuring customer rights, fulfilling contract terms, and handling legal responsibility for tech failures or fraud. For instance, digital and mobile banking need clear legal rules for electronic contracts, digital signatures, and the use of digital evidence. Also, working with fintech companies and using AI in credit checks challenge traditional regulations, which means the legal system needs to be flexible and ready for the future.<sup>1</sup>

Banking law is important because it helps keep a balance between encouraging new ideas and keeping things safe.<sup>2</sup> If there are too many rules, banks might not be able to innovate or stay competitive. But if there aren't enough rules, customers and the whole financial system could be in danger. That's why banking law creates a set of rules that support progress while protecting people's interests, keeping the financial system stable, and building confidence in banks.

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<sup>1</sup> L Chandra Kumar v Union of India (1997) 3 SCC 261.

<sup>2</sup> Dr Ram Manohar Lohia v State of Bihar AIR 1966 SC 740.

## BANKING LAW INNOVATION

The banking industry, which has long been viewed as a reliable part of the economy, is now undergoing fast changes because of new technologies. Innovations like digital banking and cryptocurrencies have changed how financial transactions work. These technologies allow customers to manage their money from home without going to a bank in person. Cryptocurrencies, in particular, have created a new type of money that doesn't rely on central banks, which challenges the usual way that money is controlled. However, regulating these new technologies is difficult<sup>3</sup>. Cryptocurrencies work on a network that isn't controlled by any single authority, making it hard for regulators to have control. Digital banking also operates across different regions, which creates complications with who has the power to regulate and can challenge old rules.<sup>4</sup>

In response to these challenges, banking laws around the world have seen major changes. Many countries have introduced or are thinking about introducing new rules that are specifically designed for cryptocurrencies. These laws are meant to stop illegal activities like money laundering and fraud, which are often linked to cryptocurrencies because of their anonymous nature. At the same time, these laws also aim to protect consumers by making sure that cryptocurrency exchanges work in a clear and fair way.

Alongside this, laws are being updated to deal with digital banking. These laws are meant to protect customers by ensuring banks use strong security measures to keep their data safe. They also aim to make sure that customers have good options for resolving any problems they might have with their bank<sup>5</sup>. This section could include examples of countries that have successfully changed their banking laws to keep up with new technologies.

For example, the European Union has been leading the way in regulating digital banking through the Second Payment Services Directive (PSD2)<sup>6</sup>. This law has set strict security standards for digital banking and has also allowed non-bank companies to compete in the banking sector.

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<sup>3</sup> Internet and Mobile Association of India v Reserve Bank of India (2020) 10 SCC 274.

<sup>4</sup> Delhi High Court, Court on its Own Motion v Union of India (2025) (Digital Lending Apps Case) (Delhi HC).

<sup>5</sup> Reserve Bank of India, 'Guidelines on Digital Lending' (2 September 2022).

<sup>6</sup> Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market (PSD2) [2015] OJ L337/35.

## **INNOVATIVE PRODUCTS IN BANKING**

### **Innovation happens out of dire necessity**

Innovation isn't about flashy activities or big events. It's really about dealing with tough market problems and strict rules. It's an ongoing process of changing how things are done, and it can be messy and unpredictable. It's about trying to make progress even when things are complicated and divided within financial institutions.

### **Successful innovation is determined by a combination of factors**

The most successful financial institutions make many strategic and operational changes. These changes include improving processes and technology, adjusting workflows, changing how their network is set up, and improving how services are provided to achieve effective innovations.

### **Financial institutions go through distinctive stages in Innovation**

Depending on how developed the market is, banks start by introducing new products, then move on to improving their sales methods and increasing their market share, and finally they focus on enhancing customer service.

### **Retail banking in Asia has become more innovative in the last two years**

Most of the bankers who responded said their bank is more innovative now compared to two years ago, when the Lehman crisis happened. The crisis actually pushed innovation forward in many areas, but products and ways of reaching customers are still the main areas where banks are focusing their efforts.

### **Despite the financial crisis banks continue to increase their investments in innovation**

On average, 63% of the respondents say their banks have improved innovation in the past year, while 34% report no change.

### **The main objective of innovation SBI is growth**

23% of the banks that responded said they mainly innovate to achieve growth, while 62% mentioned they aim for both growth and efficiency. When looking closely at the results, it's clear that growth is the main reason for innovation, and efficiency is seen more as a supporting goal.

**Strategic innovation is rare and concentrates around international banks and small niche players.**

56% of banks say they are mostly working on incremental innovation, while only 12% focus on strategic innovation. Since strategic innovation examples are rare and happen only once in a lifetime, the 12% figure for strategic innovation might be too high.

### **Product Innovation Stage**

In quickly growing markets such as Vietnam, China, Sri Lanka, Bangladesh, and India, where many people don't have access to banking services, governments have been changing rules in recent years. These changes let banks offer more types of consumer finance products as part of their services. Most financial institutions have big mortgage portfolios, which make up 85% or more of their retail assets. The market has been mostly closed to foreign competition and is mainly controlled by local banks. Banks are introducing new but simple products.

### **Sales Innovation Stage**

In countries like Thailand, the Philippines, Malaysia, Indonesia, and India, where basic infrastructure is already well-developed, private banks focus on both efficiency and growth, seeing them as equally important for their long-term success. When banks are still expanding their customer services, they gain a lot from improving process efficiency through innovation. This helps them speed up services, cut costs, make processes smoother, and centralize operations. Before more market changes happen, banks are working hard to build their asset portfolios, often using new pricing strategies to increase their share of the market.

### **Market Share Innovation**

At this point, banks begin to offer more affordable ways to distribute their services, and along with ease of access and convenience, these factors are crucial for maintaining their competitive edge. Banks are improving their internal processes, linking transactions with the back-office systems, and streamlining their network locations. While customers aren't fully integrated across all platforms yet, there's a strong push towards greater integration through innovations in how processes and operations are handled.

## **Innovations in the Indian Banking Sector**

- Types Of Innovative Banking
- Types Of Products And Service
- Electronic System

### **Types Of Innovative Banking**

1. Structural And Business Model Innovation
2. Technological And Infrastructure Innovation
3. Intelligent And Algorithmic Innovation
4. Purpose-Driven And Niche Innovation

### **STRUCTURAL AND BUSINESS MODEL INNOVATION**

These new ideas are changing the basic ways and players in banking, moving from a single, unified system to a more flexible, platform-driven structure.

- Neobanking and Challenger Banks: These banks are not tied to a specific location. They don't rely on old, expensive systems, allowing them to provide better user experiences at lower costs.
- Banking-as-a-Service (BaaS): This is a business-to-business approach where traditional banks offer their banking services to other companies through APIs. Much of the research looks at how the banking system can be broken down into smaller, separate parts.
- Embedded Finance: This involves adding financial services like payments, loans, and insurance into non-financial platforms, such as Shopify or Uber. In studies, this is often looked at in terms of how it fits into the customer's overall experience.

### **TECHNOLOGICAL AND INFRASTRUCTURE INNOVATION**

This layer looks at the basic structures that support banking, focusing on how fast, safe, and decentralised these systems are.

Open Banking and Open Finance: This involves moving from private data systems to ones where data can be easily shared. It's a big topic for regulation, like the PSD2 and PSD3 rules, and how it affects competition in the market.

Decentralised Finance (DeFi) and Blockchain: These use a type of technology called distributed ledger to eliminate the need for middlemen. A lot of studies look at smart contracts, which automatically enforce agreements and build trust.

Central Bank Digital Currencies (CBDCs): These are digital currencies issued by governments. In 2026, research is focusing on the difference between using them for everyday transactions and for larger, business-related ones, and how that affects how central banks control money.

### **INTELLIGENT AND ALGORITHMIC INNOVATION**

These innovations use data science to change how banking works, shifting it from responding to problems after they happen to preventing them before they occur. Agentic AI and Hyper-Personalisation: Going beyond simple chatbots, these systems use AI agents that can make financial decisions on their own, like moving money to a better interest rate account without needing user input.

Predictive Credit Scoring (Alternative Data): This method uses non-traditional data sources such as social media activity, utility bills, and psychological traits to evaluate someone's creditworthiness. It's especially important for improving financial inclusion.

Real-time Risk Management: This involves using machine learning to detect fraud and ensure compliance with anti-money laundering rules right at the moment a transaction happens, often without the customer even knowing.

### **PURPOSE -DRIVEN AND NICHE INNOVATION**

Innovations that match banking services with particular social or environmental values.

- Green Banking (Transition Finance): Banks that use ESG (Environmental, Social, and Governance) scores to give better interest rates for sustainable projects or include options to offset carbon emissions at the time of purchase.
- Circular Economy Banking: Creating financial products tailored for “product-as-a-service” business models, such as offering leasing options instead of selling products outright.

## TYPES OF PRODUCTS AND SERVICES

In today's 2026 environment, the way banking products are classified has changed from "static products" like a basic savings account to "dynamic services" such as automated liquidity management.

Functional Taxonomy of Banking Products. Academic studies usually group products according to the main financial need they address.

- **Asset Products (Lending)**
  - **Retail Lending:** This includes mortgages, personal loans, and credit cards. A major development in 2026 is Hyper-personalised Credit, where interest rates change in real time based on the borrower's behaviour.
  - **Corporate & Commercial Lending:** This involves syndicated loans, trade finance, and term loans for small and medium-sized enterprises.
- **Liability Products (Deposits)**
  - **Core Deposits:** These include savings accounts, current or checking accounts, and fixed-term deposits.
  - **Tokenised Deposits:** This is an area of research set to develop by 2026, where traditional bank deposits are turned into digital tokens, allowing for fast, programmable, and continuous settlement around the clock.
  - **Green Deposits:** These are funds set aside for projects that have been verified to meet environmental, social, and governance (ESG) standards, and they often require a clear and transparent reporting system for the depositor.
- **Fee-Based & Auxiliary Services**

Advisory & Wealth Management: Shifting from human advisors to AI Copilots that handle portfolio management on their own.

- **Bancassurance:** Selling insurance products through banks.
- **Safe Custody:** Going from physical lockers to digital storage for private keys and NFTs.
- **Advanced Service Models (Academic Classification)** Research in 2026 focuses on the delivery mechanism as a service in itself. Banking services are moving from "self-service" (using an app) to "delegated service."
- **Agentic Commerce:** AI agents that hold "Agent Accounts" and can autonomously pay for subscriptions, negotiate better rates, or manage utility bills.

- Programmable Payments: Services that allow customers to set logic-based rules, such as "If my balance exceeds \$X, automatically move the surplus to a Green Bond."
- **Corporate & Treasury Services**
- Liquidity Orchestration: Get real-time visibility into multiple bank accounts using API connections.
- Sustainability-Linked Finance: Corporate loans with interest rates tied to the company's real-time carbon footprint or social impact metrics.

## **ELECTRONIC SYSTEM**

- **Customer-Facing Electronic Channels**

These systems focus on User Experience (UX) and Access. Research in this area often covers adoption rates, security, and digital inclusion.

- Internet/Online Banking: Web-based portals that allow 24/7 account management, bill payments, and investment services through desktop computers.
- Mobile Banking (M-Banking): App-based systems that use Smartphone features such as push notifications and GPS.
- Automated Teller Machines (ATM) & Interactive Teller Machines (ITM): Electronic kiosks used for cash management. Modern ITMs often include video conferencing with live tellers.
- Telephone/SMS Banking: Interactive Voice Response (IVR) systems and text-based alerts for people who don't have smartphones or are in areas with limited internet connectivity.
- Digital Wallets & Super Apps: Systems like Apple Pay, Google Pay, or Alipay that combine payment cards and loyalty programs in one place.

- **Transactional and Payment Systems**

These are the rules and networks that help move money between people and institutions. This is a key topic in research about blockchain and fast processing.

- Real-Time Gross Settlement (RTGS): These systems handle large-value transfers instantly between banks, like Fedwire in the US or CHIPS.

- **Electronic Funds Transfer (EFT):** This includes methods like National Electronic Fund Transfer (NEFT) or Automated Clearing House (ACH), which process multiple transactions at once in batches.
- **Unified Payments Interface (UPI):** It's a system that allows quick money transfers from person to person (P2P) and from person to business (P2M) through mobile apps.
- **Core and Backend Infrastructures**

These systems serve as the foundation for how a bank operates.

- **Core Banking Solutions (CBS):** These are centralised systems, such as Infosys Finacle or Temenos, that keep track of all transactions and update customer accounts across all branches instantly.
- **Application Programming Interfaces (APIs):** These are essential for Open Banking, enabling third-party apps like Fintechs to securely interact with a bank's data.
- **Fraud Detection Systems (FDS):** These are AI-powered tools that watch for unusual activity and can identify potentially harmful transactions in a very short time.

## 8 INNOVATIVE BANKING SOLUTIONS EVERY DIGITAL STATERGY NEEDS

- **Cloud-native Core Banking Platforms:** One of the biggest changes happening in banking today is moving away from old core banking systems to cloud-native platforms. These old systems were built in the 1980s or 1990s and are usually big, hard to change, and customised for specific needs. This makes it hard for banks to keep up with digital improvements. Cloud-native platforms, on the other hand, are built from scratch to work in public, private, or hybrid cloud environments
- **Embedded Finance and Banking as a Service (BaaS):** Banking is no longer just about physical branches. Trends in banking technology, like embedded finance and Banking as a Service (BaaS), let financial services be built into non-banking platforms. For example, payment, lending, or insurance features can be included in e-commerce sites, ride-sharing apps, retail checkout systems, or gig economy platforms. This allows tech companies, retailers, or service providers to offer financial tools directly within their user experiences, without needing a banking license.
- **Hyper-personalised Mobile Banking Experiences:** Consumers now expect banking services that are just as tailored as the personalised experiences they get from their favourite streaming, shopping, or fitness apps. In mobile banking, hyper-

personalisation uses real-time data on user behaviour, artificial intelligence, and predictive insights to understand customer needs and offer relevant suggestions

- **AI-powered Customer Service and Virtual Assistants:** Artificial intelligence has transformed customer service in banking from a model that relies heavily on human agents to one that is smart, automated, and scalable. AI-driven virtual assistants and chatbots now handle a wide range of tasks, from answering basic questions and helping with transactions to providing personalised advice, resolving disputes quickly, and guiding users through processes like account setup or loan applications.
- **Biometric Security and Advanced Authentication Mechanisms:** As cyber threats become more serious, banks are using biometrics and other advanced ways to keep accounts secure without making it hard for customers. Fingerprint recognition, facial scanning, and voice authentication are new banking ideas that replace fixed passwords with dynamic, harder-to-fake security methods. These physical biometrics are paired with behavioural biometrics, which look at things like typing speed, how a device is moved, or how someone interacts with it to spot unusual activity in real time.
- **Open Banking and API Ecosystems:** This digital banking idea lets customers share their financial data with approved third parties through secure APIs. For banks, it helps break down data silos. Open banking has been pushed forward by regulations like the updated Payment Services Directive (PSD2) in Europe or India's Account Aggregator framework. Banks are now seeing open banking as a chance to innovate rather than just a compliance task. By working with fintech companies and using open APIs, they can offer new services like dashboards that bring all your accounts together, personalised loan offers, or AI tools for credit and wealth management.
- **Real-time Payments and Digital Wallet Ecosystems:** People want payments to be quick, simple, and available anywhere, and digital wallets, along with real-time payment systems, are making this happen. Systems like India's UPI, Europe's SEPA Instant, and the US FedNow service allow money to move instantly, changing how money flows for both customers and businesses. These digital banking solutions offer instant confirmation and show when money is available, making it easier to send money to friends, pay at stores, and handle quick international payments where supported. Often, these systems work with digital wallets that bring together your cards, bank accounts, loyalty points, and past transactions all in one easy-to-use mobile app.

- **RegTech and Automated Compliance Frameworks:** As financial rules get more complex and the penalties for breaking them get higher, banks and financial institutions are turning to RegTech to help them stay on top of things. These technologies let them follow rules without being buried by daily tasks. Using machine learning and data analysis, RegTech tools can watch transactions as they happen, detect unusual activity, and point out possible problems. They support automatic know-your-customer (KYC) processes with tools that read documents using OCR and verify identity with biometrics, making it faster to sign up new customers while still keeping everything legal. Automated anti-money laundering (AML) systems keep looking at patterns and connections across customer data, international money flows, and past transactions.

## CASE LAWS

### 1. RBI v. Sahara India Financial Corporation Ltd. (2017)<sup>7</sup>

The Ruling: The Supreme Court ruled that any digital financial activity related to taking deposits or transferring funds must follow strict regulatory rules, no matter if the company is a traditional bank or a fintech startup.

Innovation Impact: It set a precedent that "innovative" business models do not exempt companies from the Banking Regulation Act if they perform banking-like functions.<sup>8</sup>

### 2. Delhi High Court Suo Moto (2025/2026) regarding Digital Lending Apps

The Issue: The court asked the RBI to respond to claims that digital lending apps were unlawfully accessing and using borrowers' data.

The Ruling: The court stated that ensuring security and digital stability is more important than business interests. It required banks and their technology partners to regularly check their automated systems to avoid "algorithmic errors" that might hurt consumers.

### 3. State Bank of India vs. Sri Biresh Chandra Gangopadhyay (2025)<sup>9</sup>

The Issue: Disputes occurred because banks upgraded customer accounts to full internet banking access without getting clear permission, which resulted in security issues.

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<sup>7</sup> Reserve Bank of India v Sahara India Financial Corporation Ltd (2017) (SC India).

<sup>8</sup> Reserve Bank of India v Peerless General Finance and Investment Co Ltd (1987) 1 SCC 424.

<sup>9</sup> State Bank of India v Sri Biresh Chandra Gangopadhyay (Telangana High Court, W.P. No. 31150 of 2024, 11 April 2025).

The Ruling: The Telangana High Court said that although digital advancements are a key part of modern banking, banks must ensure that customers give clear and informed consent. They emphasised that innovation cannot replace the legal need for proper consent when offering digital services.<sup>10</sup>

### **Conclusion**

Innovation in the banking sector is increasingly being redefined by its social and environmental footprint. This research demonstrates that digital products—such as micro-lending platforms and blockchain-enabled cross-border payments—have significantly lowered the barriers to financial entry for underserved populations. Furthermore, the integration of ESG (Environmental, Social, and Governance) analytics into core banking products indicates a shift toward a more responsible financial future. The conclusion drawn is that the "next wave" of banking innovation will not be driven by profit alone, but by the pursuit of inclusive growth and sustainability. To remain relevant, financial institutions must align their innovation pipelines with global sustainability goals, ensuring that the digital divide is bridged rather than widened.

Banking is changing, and now it's not just about making money—it's about how it affects people and the planet. This study shows that new digital tools, like platforms for small loans and payment systems using blockchain, are helping more people get access to financial services. These tools are making it easier for those who have been left out of the traditional banking system to participate. Also, banks are starting to use tools that look at environmental, social, and governance factors when making financial decisions. This shows a move toward a more responsible way of doing business. The main point is that the next big changes in banking won't just be about making profits. Instead, they'll focus on growing the economy in a way that includes everyone and protects the environment. To stay competitive, banks need to make sure their new ideas match up with global efforts to be more sustainable. That means helping to close the gap between those who have access to banking and those who don't.

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<sup>10</sup> Justice KS Puttaswamy (Retd) v Union of India (2017) 10 SCC 1.