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# DISCLAIMER

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## *ABOUT US*

WHITE BLACK LEGAL is an open access, peer-reviewed and refereed journal providededicated to express views on topical legal issues, thereby generating a cross current of ideas on emerging matters. This platform shall also ignite the initiative and desire of young law students to contribute in the field of law. The erudite response of legal luminaries shall be solicited to enable readers to explore challenges that lie before law makers, lawyers and the society at large, in the event of the ever changing social, economic and technological scenario.

With this thought, we hereby present to you

# FINANCIAL SERVICES AND FIN-TECH REGULATORY MECHANISMS: A VEXED QUESTION AMIDST AI ADOPTION

AUTHORED BY - LOKESH MITTAL & SANIGHDHA

"Artificial intelligence will affect each and every service that we possess.[1]"

*- Tim Cook, CEO (Apple)*

## I. INTRODUCTION: FINANCIAL SERVICES AND ARTIFICIAL INTELLIGENCE

"Artificial intelligence allows people to utilize technology to do things they never imagined that they could do before.[2]"

- *Neil Jacobstein (Head- AI and Robotics, NASA Research Park)*

Since time immemorial, man has had the opportunity and desire to grow in multiple fields and spheres of life, by increasing the pleasure amidst the chaos of this world. From discovering the concept of fire, to collecting and gathering edible products and cooking the raw into fine; from inventing wheel and the concept of vehicles as well as dwellings and societies; from improving clothing to becoming conscious to dignity and respect; from inventing paper and ink to discovering the vast world of internet and technologies- humans have come a long way. This way has also led to the invention of artificial intelligence as well as its proliferation into the personal and professional lives of the world citizenry.[3]

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[1] *Apple CEO Tim Cook on calling its AI System, Apple Intelligence*, TIMES OF INDIA, (Jun.12, 2024 7:57 IST), https://timesofindia.indiatimes.com/technology/tech-news/apple-ceo-tim-cook-on-calling-its-ai-system-apple-intelligence-it-was-sort-of-calling-it-what-/articleshow/110919792.cms.

[2] Neil Jacobstein, *AI in the Financial Sphere*, MEDIUM (Aug. 13, 2018), https://medium.com/predict/ai-in-the-financial-sphere-d4384854ee1e.

[3] R.C. MAJUMDAR, ANCIENT INDIA (2017); MANOSHI SINHA, VISHWA GURU BHARAT: THE ECHOES OF THE ANCIENT (2023); M. VENKATRAMAN, ANCIENT SAGES OF INDIA; SRI JADUNATH SARKAR, INDIA THROUGH THE AGES (2021); DAVID GILMOUR, THE BRITISH IN INDIA: A SOCIAL HISTORY OF THE RAJ (2018); SHASHI THAROOR, THE INGLORIOUS EMPIRE: WHAT THE BRITISH DID TO INDIA (2017); SHASHI THAROOR, AN ERA OF DARKNESS (2017); WILLIAM DARLYMPLE, THE ANARCHY: THE EAST INDIA COMPANY (2019); ALEX VONN TUNZELMANN, THE INDIAN SUMMER: THE SECRET

No one would have imagined controlling innumerable electronic devices via their phones or their remote controls, some decades back, and yet, today it is the reality that has shocked as well as excited people. In India, where the connectivity has even reached the most illiterate backgrounds and the remotest areas of habitants- the inward way of connectivity and communication services is not going to change its path anytime soon. It is going to reach the most secluded of the world population, very soon and is poised to become the highest valuable service that was ever invented. No one doubts that human intelligence or emotional intelligence can never be compared, but technical and artificial intelligence is meant and will be used in synchronization with the former to bring out a beautifully balanced and harmonized relationship of the real and the virtual- provided both are used to serve the humanity and the larger purpose of the existence of this universe and the metaphysical world.

On the other hand, financial services are not a new system of transaction. Back in the golden days of yore and folklore, people used to exchange their items with other items of need. This was and is still known as the barter system of transaction. Although, it is not very prevalent today, it still holds ground in various parts of the world. Especially in the tribes of Nicobar and Lakshadweep whereby the people do not want to access monetary services and bask in their glory of traditions and ancient practices, this is a well-known societal rule. Even in villages of India and other cities, people are poised to practice barter system as and when need arises, especially within close relations. However, since the world needed some standard yardstick of exchanging their goods and services, the world and the world organisations committed themselves to carve out a space for monetary transactions and hence money was born.

Money is not a very old invention. However, it has made a lot of things simple and simpler for other services as well. From discovering money to developing financial services through central banks and regional banks, across nations and cities, men have come a long way in discovering their needs and fulfilling the basic essentials of their community and the world. Financial services have developed and made way for financial technologies, better known as fin-tech in today's world. Digital banking and transactions have opened up the gates to an unimaginable world of

HISTORY OF THE END OF AN EMPIRE (2007); JOHN MARSHALL, MOHENJO DARO AND THE INDUS VALLEY CIVILISATION (2020); GREGORY L. POSEHLL, THE INDUS CIVILISATION (2002); ANDREW ROBINSON, THE INDUS: LOST CIVILISATIONS (2015).

finance and banking. The digitization of rupee or other currencies of the world, as well as the emergence of bitcoin and other online currency, has made the lives of men simpler, but also raised many questions of safety and online privacy as well as security.

Financial services and fin-tech regulations amidst the world and generation of more and more artificially intelligent world of today has raised increasing conundrums and dilemmas on the vires of constitutional principles, constitutionalism, digital and living constitutionalism, data protection laws, banking and financial services laws, the acceptance or non-acceptance of bitcoin and other online currencies amidst the issues of environmental degradation and sustainable development goals. Financial services are defined as, "*the financial services sector is comprised of banking, mortgages, credit cards, payment services, tax preparation and planning, accounting, and investing. Financial services are often limited to the activity of firms and professionals, while financial products are the financial instruments these professionals provide to their clients.[4]*" Financial technologies or Fin-tech are defined as, *"FinTech (financial technology) is a catch-all term referring to software, mobile applications, and other technologies created to improve and automate traditional forms of finance for businesses and consumers alike. FinTech can include everything from straightforward mobile payment apps to complex blockchain networks housing encrypted transactions.[5]"*Financial regulatory mechanisms are defined as, "*Financial regulation refers to the rules and laws firms operating in the financial industry, such as banks, credit unions, insurance companies, financial brokers and asset managers must follow. However financial*

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[4] Thomas J. Catalano, *Importance and Components of the Financial Services Sector*, INVESTOPEDIA, (Jan. 9, 2024), https://www.investopedia.com/ask/answers/030315/what-financial-services-sector.asp; DEVIE MOHAN, THE FINANCIAL SERVICES GUIDE TO FINTECH- Driving Banking Innovations through Effective Practices (2020); MY KHAN, FINANCIAL SERVICES (2019); THUMMULURI SIDDHAIAH, FINANCIAL SERVICES (2011); JUSTIN PAUL, MANAGEMENT OF BANKING AND FINANCIAL SERVICES (2007); PHILIP AUGAR, THE BANK THAT LIVED LITTLE: BARCLAYS IN THE AGE OF VERY FREE MARKET (2018); DR. S,. GURUSWAMY, FINANCIAL SERVICES- ESSENTIALS (2005); GREGORY ZUCKERMAN, THE MAN WHO SOLVED THE MARKET- HOW JIM SIMMONS LAUNCHED THE QUANT REVOLUTION (2019); G.S. BATRA, FINANCIAL SERVICES AND MARKETS (2002); MOIRA SOMERS, ADVICE THAT STICKS, HOW TO GIVE FINANCIAL ADVICE THAT PEOPLE WILL FOLLOW (2018); A PRACTICAL GUIDE TO FINANCIAL SERVICES: KNOWLEDGE, OPPORTUNITIES AND SERVICES (2021); SYLVIA CONWAY HUDGINS, BANK MANAGEMENT AND FINANCIAL SERVICES (2012).
[5] *Financial Services*, COLOMBIA ENGINEERING, https://bootcamp.cvn.columbia.edu/blog/what-is-fintech/; Sean Peek, What is Fintech: Definition, Evolution and Examples, U.S CHAMBER OF COMMERCE, https://www.uschamber.com/co/run/business-financing/what-is-fintech; DR. KOMAL MISTRY, FINTECH IN INDIA; JASPAL SINGH, FINANCIAL TECHNOLOGY: FINTECH IN INDIA AND DIGITAL BANKING IN INDIA (2022); KRISHNA POTNIS, CONNECTING FINTECH (2023); SANJAY PHADKE, FINTECH FUTURE: THE DIGITAL DNA OF FINANCE (2023); PARAG Y. ARJUNWADKAR, FIN-TECH: THE TECHNOLOGY DRIVING DISRUPTIONIN THE FINANCIAL SERVICES INDUSTRY (2018).

*regulation is more than just having rules in place - it is also about the ongoing oversight and enforcement of these rules.6"*

Artificial intelligence can and has the potential to automate many banking financial services like payments, deposits and transfers and customer service requests. It can also handle customer requests for credit and debit card transactions. That is why regulating the myriad space of artificial intelligence and the intersection of financial services as well as financial technology is so important. The scope of artificial intelligence can be defined as, *"Along with other technologies (e.g., sensors, geolocation, robotics) AI can perform tasks that would otherwise require human intelligence or intervention. Digital assistants, GPS guidance, autonomous vehicles, and generative AI tools (like Open AI's Chat GPT) are just a few examples of AI in the daily news and our daily lives. As a field of computer science, artificial intelligence encompasses (and is often mentioned together with)* <u>*machine learning*</u> *and* <u>*deep learning*</u>*. These disciplines involve the development of AI algorithms, modeled after the decision-making processes of the human brain, that can 'learn' from available data and make increasingly more accurate classifications or predictions over time[7]."*

The present manuscript strives to delve into the world of financial services (both real and virtual), their extent of impact, the issues that are related to it, the impact that artificial intelligence has on them, the questions that such inter-section has raised and the solutions that can be practiced by the regulators as well as the people who are availing such services to secure their lives, virtually. It is question of perspective and innovation, that alone can drive the world towards solutions to these

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[6] *What is Financial Regulation and Why Does it Matter*, CENTRAL BANK OF IRELAND-EUROSYSTEM, https://www.centralbank.ie/consumer-hub/explainers/what-is-financial-regulation-and-why-does-it-matter; DANNY SCHECTER, THE FINANCIAL SERVICES INQUIRY REPORT: THE FINAL REPORT OF THE NATIONAL COMMISSION ON THE CAUSES OF FINANCIAL AND ECONOMIC CRISIS IN THE UNITED STATES INCLUDING DISSENTING VIEWS (May 31, 2011); ESTER FAIA, FINANCIAL REGULATION; HARSHA JARANI, FINANCIAL MARKET MANAGEMENT (20240;

[7] *What is Artificial Intelligence (AI)*, IBM, https://www.ibm.com/topics/artificial-intelligence; MAX TEGMARK, LIFE 3.0 (2017); PETER NORVIG, ARTIFICIAL INTELLIGENCE (1995); YOSHUA BENGIO, DEEP LEARNING (2015); MELANIE MITCHELL, ARTIFICIAL INTELLIGENCE (2019); NICK BOSTROM, SUPERINTELLIGENCE-PATHS, DANGERS AND STRATEGIES (2014); HENRY KISISNGER, THE AGE OF AI (2021); STUART J.RUSELL, HUMAN COMPATIBLE (2019); BRIAN CHRISTIAN, THE ALIGNMENT PROBLEM (2020); AURELION GUREN, HANDS ON MACHINE LEARNING (2017); PURVI POKHARIYAL, ET. AL., ARTIFICIAL INTELLIGENCE: LAW AND POLICY IMPLICATIONS (2022); SERENA QUATROCOLLO, ARTIFICIAL INTELLIGENCE, COMPUTATIONAL MODELLING AND CRIMINAL PROCEEDINGS (2020); DR. DARYL J. CARLTON, AI GOVERNANCE: APPLYING AI POLICY AND ETHICS THROUGH PRINCIPLES AND ASSESSMENTS (2024); RAJIV MALHOTRA, ARTIFICIAL INTELLIGENCE AND THE FUTURE OF POWER: 5 BATTLEGROUNDS (2021).

problems, otherwise they will surely mount, amidst the rising level of technological inventions that are taking place, at a much faster pace. Therefore, the manuscript will, with the aid of doctrinal method of research, secondary data sources and jurisprudential trajectory in the world as well as India, define and justify the title as well as the objectives associated with it.

## II. ARTIFICIAL INTELLIGENCE AND THE FINANCIAL SECTOR: AN ANALYSIS

Finance as a larger term is associated with monetary assets and liabilities. Financial services include banking, credit cards and transactional services. Financial services also include financial management and consumer finance. It includes market liquidity rates, risk instruments and brokerage issues, macroeconomic scales. Risk analysis, transactional issues, processing of consumer service requests, deposits and transfers are the basic functions that have to be performed by the companies and the organisations that are involved in the financial businesses. However here comes artificial intelligence. Artificial intelligence can perform these functions methodically and logically via the large language modelling systems (LLMs). This is the procedure and the crux behind the whole system and apparatus of artificial intelligence. Sentiment analysis, anomaly detection, speech recognition, document processing, image recognition, data science and analytics, customer conversations, predictive modelling, choice selection are the basic functions performed by artificial intelligence, when integrated in any other systematic apparatus for profit and result maximization- with utmost accuracy, automation, and efficiency.[8]

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[8] SAURABH MUKHERJEA, THE UNUSUAL BILLIONAIRES (2016); SEAN STEIN SMITH, BLOCKCHAIN ARTIFICIAL INTELLIGENCE AND FINANCIAL SERVICES (2020); PRABHASH GOLAGADERA, AI FOR FINANCE PROFESSIONALS (2024); YVES HILPISCH, ARTIFICIAL INETLLIGENCE IN FINANCE (2020); LOPEZ DE PRADO, THE AI BOOK: THE ARTIFICIAL INTELLIGENCE HANDBOOK FOR INVESTORS, ENTREPRENEURS, AND FINTECH VISIONARIES (2020); VIKAS GARG, ET. AL., APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN FINANCE AND BUSINESS: MODERN TRENDS (2021); EDWARD TSANG, AI FOR FINANCE (2023); YVES HILPISCH, PYTHON OF FINANCE (2018); ARTIFICIAL INTELLIGENCE AND FINANCE (2023); EDWARD P.K., ARTIFICIAL INTELLIGENCE AND FINANCE: CHALLENGES, OPPORTUNITIES AND REGULATORY DEVELOPMENT (2023); RAJ SINGH, ARTIFICIAL INTELLIGENCE AND BANKING (2020); TREVOR HESTIE, ELEMENTS OF STATISTICAL LEARNING (2001); TONY BOOBIER, AI AND BANKING (2020); SANJAY TANEJA, ET.AL., ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING- POWERED SMART FINANCE (2024); ABHISHEK GUPTA, ARTIFICIAL INTELLIGENEC AND APPLICATIONS IN BANKING AND FINANCIAL SERVICES: ANTI MONEY LAUNDERINGA ND COMPLIANCE (2024); KAI-FU-LEE, AI SUPERPOWERS (2018); WILLIAM UC, THE AI REVOLUTION IN FINANCE (2018); HANDBOOK OF AI APPLICATIONS AND BIG DATA IN FINANCIAL INVESTMENTS (2023); *What is AI in Finance,* HEWLETT PACKARD ENTERPRISES, https://www.hpe.com/in/en/what-is/ai-in-finance.html#:~:text=AI%20can%20automate%20many%20basic,%2C%20providing%20near%2Dinstant%20respo

Algorithmic accuracy, algorithmic trading, automation and efficiency, competitive advantage and compliance, credit scoring and credit risk reduction, customer services, data analysis and cost reduction, fraud detection, loan processing, personal finances, portfolio management and processing, predictive and sentiment analysis-are other functions that are performed by the artificial intelligence when inculcated in financial services. The stakeholders who are involved in operating this whole system are- auditors and internal control teams, chief information officers and chief technology officers, customers and developers, ethics and diversity officers, executives, and financial organisations as well as legal teams and risk management teams. Blockchain[9] and bitcoin technology along with digital currency also use artificial technology systems. Artificial intelligence is widely used and will be futuristically useful in banking, online digital transactions, and fin tech regulations, as well.

Banking, as a concept is widely popular in all over the world. After the debacle and slow pace of growth of the barter system worldwide, banks came into the picture that helped the merchants and the common citizenry alike. The barter system did not work out because of double coincidence of wants, lack of information and lack of standard unit of account.[10] Indus Valley Civilisation and the other ancient civilisations of the world did not use banking or a standard unit of exchange, but they used barter system only.[11] However, it was only with the modern banking roots that got sown in the medieval and early Renaissance Europe, including Italy's Lombards and France's Cahorsins, along with the along with the growth of money-like substances and material in rich Italian cities like Florence, Venice and Genoa[12]- that banking as a profession and field grew. Banking is a

nses; *What is Artificial Intelligence in Finance*, IBM, https://www.ibm.com/topics/artificial-intelligence-finance; *How Artificial Intelligence is transforming the financial services industry*, DELOITTE, https://www.deloitte.com/ng/en/services/risk-advisory/services/how-artificial-intelligence-is-transforming-the-financial-services-industry.html.

[9] MICHAEL SAYLOR, THE BITCOIN STANDARD: THE DECENTRALISED ALTERNATIVE TO CENTRAL BANKING (2018).

[10] RAHUL BAJORIA, THE STORY OF RESERVE BANK OF INDIA (2018); RON CHERNOW, THE HOUSE OF MORGAN (2010); JACK WEATHERFORD, THE HISTORY OF MONEY (1988); STEPHEN QUINN AND WILLIAM ROBERTS, HOW A LEDGER BECAME A CENTRAL BANK (2023); SANDIP SEN, THE INSIDE STORY OF INDIAN BANKING (2020); BAKHTIAR K. DADABHOY, THE BARONS OF BANKING (2015). DOMINIC HAYNESS, A BRIEF HISTORY OF CENTRAL BANKING: HOW THE QUEST OF FINANCIAL STABILITY LED TO UNCONVENTIONAL MONETARY HABITS (2023); OP CHAWLA, EVOLUTION OF BANKING SYSTEM IN INDIA SINCE 1900 (2019).

[11] R.C. MAJUMDAR, ANCIENT INDIA (2017); MANOSHI SINHA, VISHWA GURU BHARAT: THE ECHOES OF THE ANCIENT (2023).

[12]*The Evolution of Banking Over Time,* INVESTOPEDIA, https://www.investopedia.com/articles/07/banking.asp; *The History and Evolution of Banking*, AMERICAN DEPOSISTS, https://americandeposits.com/history-evolution-

service and a bank is a licensed institution that provides loans and receives deposits. It is financial institution which performs and delves into monetary transactions and capital formation on a regular basis, unlike the capital markets or the share markets which deal in all these things, indirectly. In India, it was the Bank of Hindustan, which first came up in to the picture in the 1800's, after which the Reserve Bank of India, was set up, to commemorate its central banking functions. However, the Central Bank of India (now, the State Bank of India) is the most successful and the longest running public sector bank in the country. However, artificial intelligence has changed the whole scenario and panorama of the banking sector. According to McKinsey and Company's Annual Report, "Global Banking Annual Review: The Great Transition" (2023)[13], generative AI[14] could enhance banking productivity by 5% and reduce global expenditures by up to $300 billion. AI's position in banking began with work automation and data analysis but has now expanded to encompass sophisticated applications in risk management, fraud prevention and tailored customer service. The development of generative AI, capable of creating and predicting based on massive amounts of data, is a huge change that promises to further transform banking operations and strategy.[15] Customer data protection, customer data analysis, customer interaction, enhancing bank app interface and reshaping the whole banking scenario, are the very basic functions that can be enhanced via the process of artificial intelligence. This AI-driven customization can go beyond just functionality. It can include visual features of the app interface, including themes, layouts, and notification styles, which are tailored to the user's habits and preferences. For a consumer who favors a minimalist design, the AI may streamline the interface by removing clutter and

banking/; *The History of Banking from ancient times to now,* THE FIRST UTAH BANK, https://firstutahbank.com/the-history-of-banking-from-ancient-times-to-now/; *The History of Banking from ancient history to now*, RELAY, https://relayfi.com/blog/evolution-of-banking; AVATAR SINGH,. BANKING AND NEGOTIABLE INSTRUMENTS (2023); VINOD KOTHARI, BANKING LAW AND PRACTICE IN INDIA (2021); HARIHARA KRISHNAN, BANKING INDIA: ACCEPTING DEPOSITS FOR THE PURPOSE OF LENDING (2017); B. SANTHANAM, BANKING AND FINANCIAL SYSTEM (2024); BHARATHI V. PATHAK, INDIAN FINANCIAL SYSTEM (2018); SANDIP SEN, THE INSIDE STORY OF INDIAN BANKING (2020); H.R. GUPTA, PRACTICAL BANKING IN INDIA (2024); URJIT PATEL, OVERDRAFT: SAVING THE INDIAN SAVER; ADVOCATE SIJI V. NAMBIAR, OVERVIEWING THE WORLD OF BANKING: A COMPREHENSIVE OVERVIEW OF BANKING FUNDAMENTALS (2023).

[13] *Global Banking Annual Review: The Great Banking Transition 2023*, McKinsey, AND COMPANY, https://www.mckinsey.com/industries/financial-services/our-insights/global-banking-annual-review.

[14] *What is Generative AI,* McKinsey, AND COMPANY, https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-ai; VALENTINO ALTO, MODERN GENERATIVE AI WITH CHAT GPT AND OPEN AI MODELS: LEVERAGE THE CAPABILITIES OF OPEN AI's LLM FOR PRODUCTIVITY AND INNOVATION WITH GPT3 AND GPT4 (2023); PURVI POKHRIYAL, ET.AL. ARTIFICIAL INTELLIGENCE: LAW AND POLICY IMPLICATIONS (2022); L. ALMEIDA, GENERATIVE AI TRANSFORMATION (2023).

[15] Sergei Beck, *how artificial intelligence enhances banking sector*, FORBES, https://www.forbes.com/sites/forbestechcouncil/2024/02/23/how-artificial-intelligence-is-reshaping-banking/.

emphasizing key functions. On the other side, for users who are more interested in specific analytics and insights, the app might provide a more data-rich interface that displays detailed financial figures at a glance. By harnessing AI, banks and neobanks can work to create a digital environment that feels uniquely tailored to each user, fostering a sense of familiarity and ease that elevates the overall banking experience.[16] This is the basic way in which artificial intelligence helps in banking sector, however, it has its own negative consequences and flipside as well, which will be discussed later. However, exploiting of technology and AI to improve productivity, talent management, and the delivery of products and services, is another way of upgrading banking services. This includes applying AI and advanced analytics to deploy process automation, platforms, and ecosystems. Other principles associated with success include operating more like a tech company to scale the delivery of products and services; cultivating a cloud-based, platform-oriented architecture; and improving capabilities to address technology risks. Distinctive technology development and deployment will increasingly become a critical differentiator for banks.[17] **This revolution of AI is happening in both world markets and Indian banks as well.**
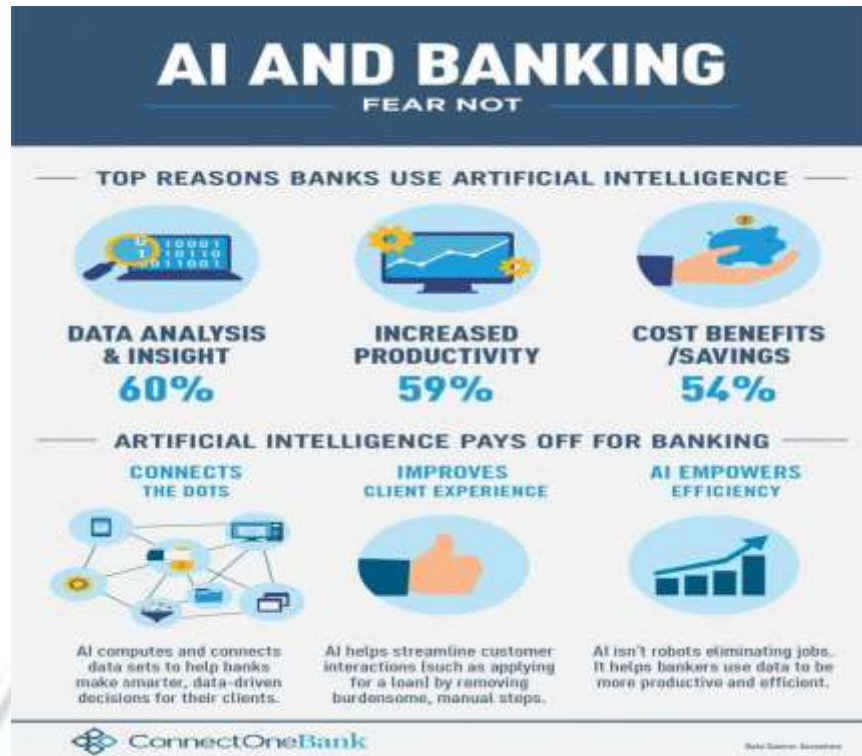
**FIGURE 1: AI IN BANKING SECTOR OVERVIEW**



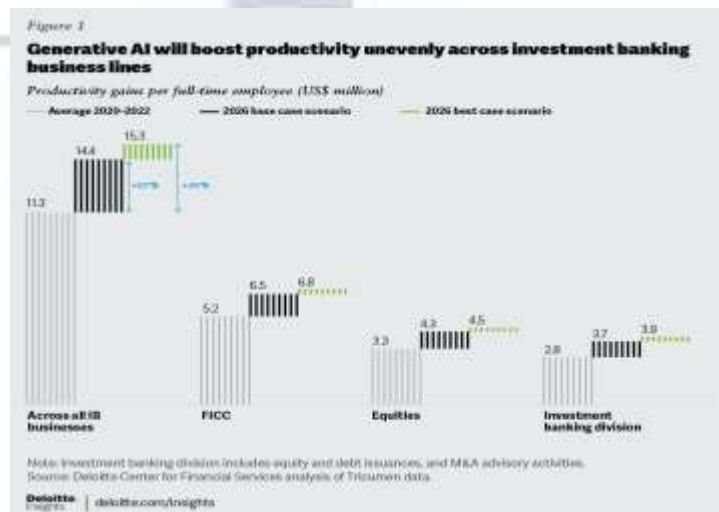*(Source: https://www.emergenresearch.com/industry-report/ai-in-banking-market)*

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[16] *Ibid.*
[17] *Ibid.*

**FIGURE 2: USE OF AI IN BANKING SECTOR: AN OVERVIEW**



*(Source: https://www.google.com/search?)*

**FIGURE 3: USE OF AI IN BANKING SECTOR AND HOW IT WILL AFFECT RETAILERS: HOW AI WILL BOOST INVESTMENT BANKING AND BUSINESSES: GLOBAL SCENARIO**



*(Source: https://www2.deloitte.com/us/en/insights/industry/financial-services/financial-services-industry-predictions/2023/generative-ai-in-investment-banking.html)*

Even the online transactions and digital payments are on the brink of AI Revolution. Digital payments and online transactions are on a rise. **India is estimated to have the highest number of digital banking users in the world, as of 2022. The country also has the most diverse and dynamic customer base in the world, making inclusive financial growth necessary.**[18] Digital banking has democratized access to financial products for customers, leading to increased risks banks face. Risk management is becoming complex due to the volume and variety of risks. In addition, their scale and scope continue to increase due to the growth in product services and channels through which they are distributed. Traditional AI combined with generative AI has the potential to add tremendous value to the process of identifying, assessing, and mitigating risks faced by banks. One of the challenges is the risk of the increasing number of false positives – where transactions are wrongly flagged as suspect – overwhelming areas such as transaction monitoring and fraud. For example, every transaction that is identified as fraudulent or a potential money-laundering violation needs to be triaged, verified, and flagged; a process that at great volumes can overwhelm systems. AI will help risk management teams identify multiple types of risks at scale.[19] This is how generative AI can aid in helping riskless transactions on online transaction platforms. AI in the payments industry combines artificial intelligence (AI) with AP best practices to standardize and automate payment systems. The AI makes sure the right procedures are followed while streamlining operations for its human partners. As a result, bookkeeping and accounting processes become more efficient and more accurate. One form of AI uses computing power to recognize text in images. Known as optical character recognition, or OCR, it is used in invoice processing to read invoices and other financial documents, entering the relevant information into financial systems for human review. By adding machine learning, the computer can get better at recognizing this same information in future invoices:

- Transaction data, such as price
- Customer data, like shipping and billing addresses
- Potential cost savings in payment terms[20]

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[18] *AI is streamlining Banking in India*, WORLD ECONOMIC FORUM, https://www.weforum.org/agenda/2023/12/how-ai-can-streamline-indian-banking/; *The Landscape of AI in Indian Banking Sector,* JOURNAL OF INFORMATICS EDUACTION AND RESEARCH, https://jier.org/index.php/journal/article/view/688; Ayushman Baruah, *AI application in top 4 Banks*, EMERJ, https://emerj.com/ai-sector-overviews/ai-applications-in-the-top-4-indian-banks/.
[19] *Ibid.*
[20] *Ibid*.

By recognizing data in invoices, computers can automatically apply the right approval rules to each invoice, sending them to approvers without the need for human intervention. This streamlines the approval process and captures approvals electronically, even on mobile devices. Natural language processing (NLP) is a form of AI that goes beyond recognizing characters, letting computers read and process human text. With invoice, approval, and payment logs compiled in one place, AI can scan through every touchpoint in the AP process, summarize hundreds of pages of data for human auditors, and flag potentially fraudulent transactions as well as areas for special attention.[21] This is how online digital payments and transactions can be secured and protected by the use and integration of artificial intelligence and this juxtaposition of new technologies together can synergize the whole transactional atmosphere in India and as well as abroad. Blockchain technologies are also leveraging the powers and procedures of artificial intelligence and hence are building synergetic technological innovations.

**FIGURE 4: VALUE OF DIGITAL TRANSACTIONS IN THE PAST DECADE: GOLABAL SCENARIO**



*(Source: https://www.visualcapitalist.com/digital-payment-adoption/)*

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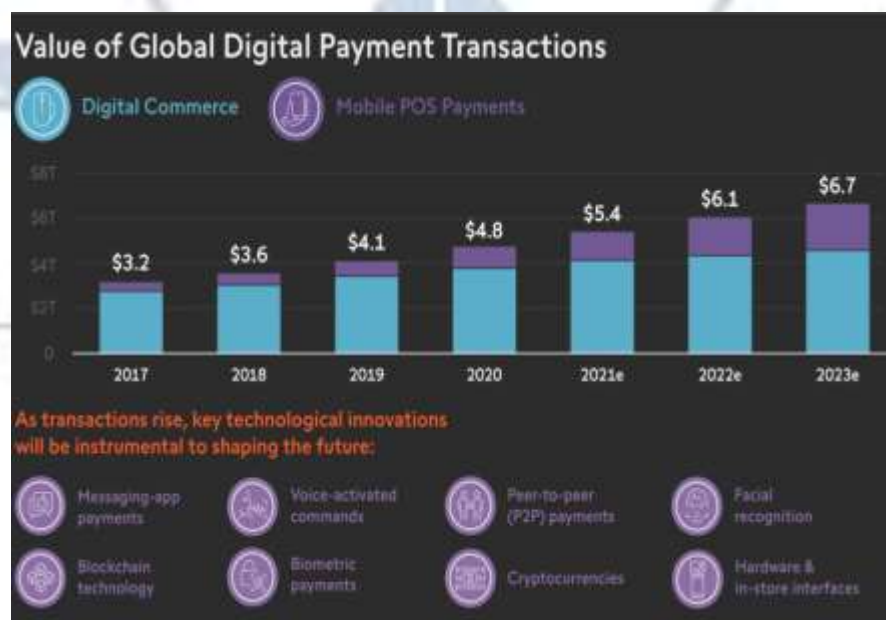
[21] *Artificial Intelligence in Digital Payments,* BILL, https://www.bill.com/blog/ai-in-payments; Harvard De Cremer and Garry Kasparov, *AI should augment human intelligence and not remove it,* HARVARD BUSINESS REVIEW, https://hbr.org/2021/03/ai-should-augment-human-intelligence-not-replace-it.

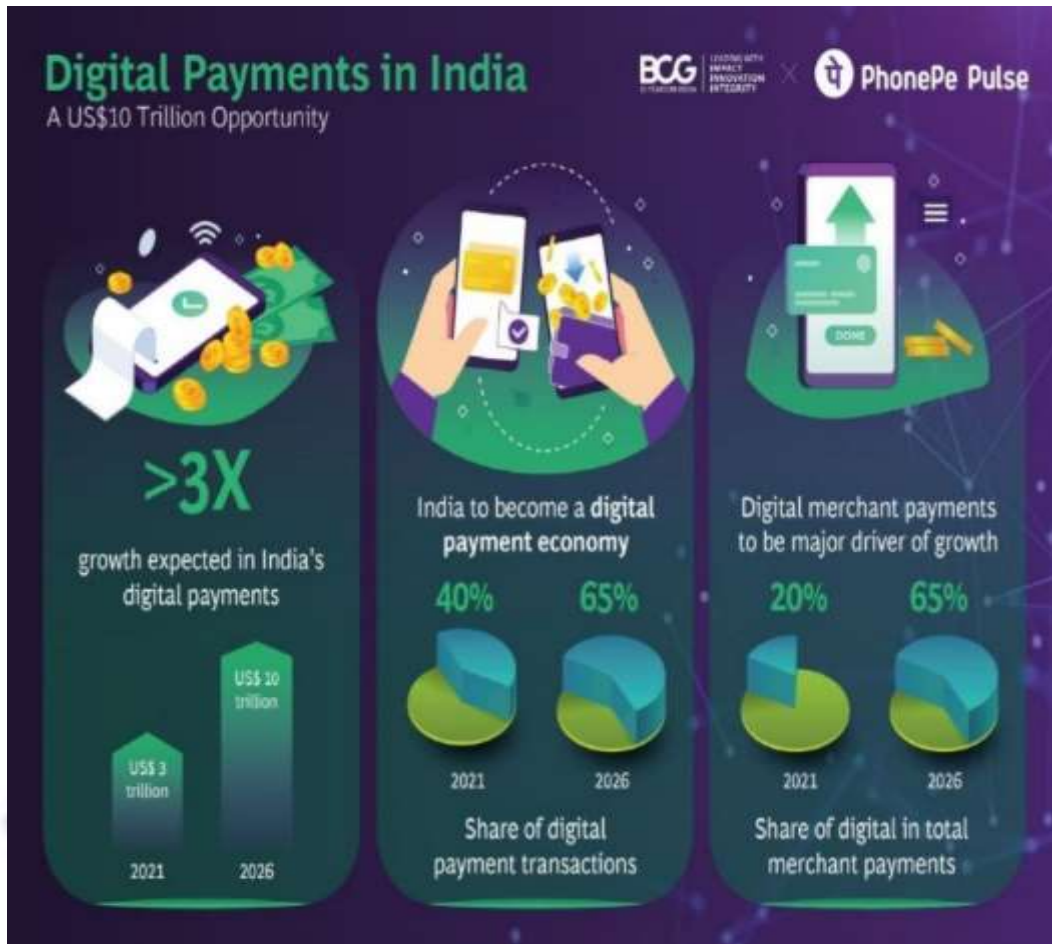**FIGURE 5: LEVERAGING AI AND BLOCKCHAIN TECHNOLOGY: AN OVERVIEW**



*(Source: https://dig.tech/2021/01/28/ai-and-blockchain-whats-the-hype-and-why-use-them-together/)*

Indian banks and financial organisations, along with the non-banking financial companies, as well as digital payment systems, such as payment apps and other services provided by banks and banking institutions, have also wholeheartedly accepted the digital transactional way of operating. This has resulted in a tenfold increase in the digital atmosphere of the country. According to an RBI Report, "India's Journey from Crisis to Confidence-2024"[22], *"the FinTech ecosystem in India has tremendously improved the delivery of financial services by making them faster, cheaper, efficient, and more accessible. India is currently the world's third largest FinTech ecosystem in terms of the number of FinTech entities operating in India. The adoption rate of FinTech in India is 87 per cent, which is well above the global average of 67 per cent. India's FinTech market is projected to reach USD 150 billion by 2025, a significant leap from USD 50 billion in 2021. The JAM trinity – a combination of bank accounts (Jan Dhan); Aadhaar (India's biometric identity system that provides a single and portable proof of identity); and Mobile phone numbers – has revolutionized India's FinTech ecosystem in terms of financial inclusion, digitization of financial services, and overall service delivery[23]."*

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[22] *RBI Bulletin*, RESERVE BANK OF INDIA,
https://rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=22315#:~:text=The%20adoption%20rate%20of%20FinTech,USD%2050%20billion%20in%202021.
[23] *Ibid.*

**FIGURE 6: UPI TRANSACTIONS OVER THE CALENDAR YEARS: THROUGH YEARS**



*(Source: https://www.microsave.net/2022/09/28/the-evolution-of-payments-in-india-the-state-of-play/)*

**FIGURE 7: THE UNPRECEDENTED EXPECTED RISE IN THE DIGITAL PAYMENTS**:



(*Source: https://community.nasscom.in/communities/digital-transformation/india-digital-payments-40-2025-outlook)*
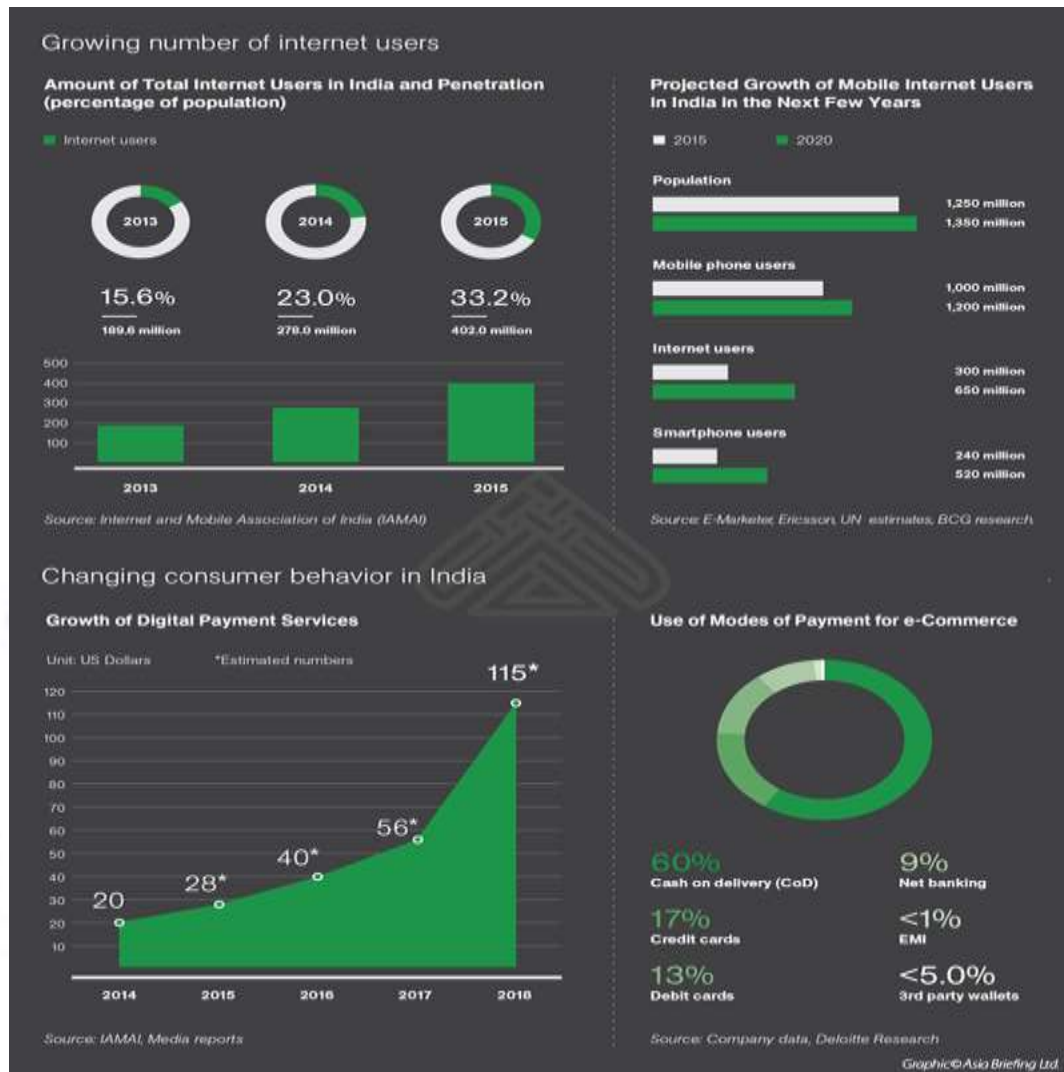
According to the RBI, "the indigenously developed Unified Payments Interface (UPI) has been the game changer. The interoperability of UPI across banks has created a unified payment ecosystem. It has facilitated digital payments for small businesses and street vendors, leading to greater financial inclusion. The success is visible with more than 12 billion transactions carried out through UPI in December 2023. Various recent enhancements to UPI like 'Conversational Payments' backed by an artificial intelligence powered system; offline transactions; and linkage of credit lines to UPI would further enhance its versatility. At the same time 'UPI One World' provides foreign nationals visiting India to transact payments through the UPI. The linkage between India's UPI and Singapore's PayNow bears testimony to the resilience of UPI as a potential global fast payment system. The journey continues as we have signed up MoUs with a few other countries to tap the benefits offered by UPI. With 24x7 operationalization of retail as well as large value payment system operated by the Reserve Bank, India is part of a club of select countries providing such round the clock facilities with real time gross settlement (RTGS). With such availability, more than 485 million digital payments happen every day. This phenomenal growth of digital payments is reflected in the Reserve Bank's composite Digital Payment Index which has increased almost four-fold in the last 5 years.[24]

In 2019, the innovative Regulatory Sandbox framework was introduced. It allows live testing of financial products or services within a controlled environment. One of its notable successes is UPI123Pay, which enables offline UPI payments. The Regulatory Sandbox framework has been made interoperable in 2023 across multiple regulators. The annual Global hackathon, HaRBInger, organised by the Reserve Bank and the Innovation Hub set up by the Reserve Bank further amplifies collaborative efforts with the private sector in the pursuit of innovation. As a step towards greater digitalization, the pilot for Central Bank Digital Currency (CBDC), e-Rupee, was launched in both wholesale and retail segments in November-December, 2022. Since then, 4 million customers have been onboarded. The CBDC will enhance digital transactions, especially in areas with limited internet connectivity. It is expected that CBDC (e-Rupee) will become a global trendsetter and facilitate seamless cross-border payments. The approach to FinTech ecosystem is customer-centric, with focus on ensuring effective oversight, ethical conduct, risk management, and encouraging self-regulation by the FinTechs themselves by establishing a Self-Regulatory

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[24] *Ibid.*

Organisation (SRO)."[25]

**FIGURE 8: INDIAN DIGITAL PAYMENTS FUTURE**



*(Source: https://www.india-briefing.com/news/growth-of-digital-payment-systems-in-india-14797.html/)*

The above data signifies that the RBI has become a harbinger of digital innovations and monetary metaphorizes in Indian banking ecosystem. This shows the infiltration of fin tech and digital payments in India, but the regulations that govern the whole ecosystem are sometimes not proper

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[25] Raghav Dhanuka, BFSI- Banking and Financial Services, INVEST INDIA, https://www.investindia.gov.in/sector/bfsi-FinTech-financial-services; *RBI Bulletin*, RESERVE BANK OF INDIA, https://rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=22315#:~:text=The%20adoption%20rate%20of%20FinTech,USD%2050%20billion%20in%202021.

or complete to deal with the upcoming challenges. This is discussed further, with practical solutions given to rectify and fill up certain loopholes.

## III. FINANCIAL REGULATORY SECTOR AND THE CHALLENGES POSED BY THE ADVENT AND GROWTH OF ARTIFICIAL INTELLIGENCE: AN ETHICO- LEGAL ANALYSIS

Often it is heard that in a society and in each and every field of life, such as spiritual, academic, professional, personal and others as well, rules and regulations are very important. This is so because to control unwarranted happenings or to address certain critical issues. Likewise, in digital banking and fin-tech sector as well, rules and regulations are utmost important. The Reserve Bank of India has always striven to regulate the monetary-financial-economical sector of the country, with utmost equibalance of regulation and free decision-making mechanism. General protection mechanisms that are adopted by global banks is illustrated below, before discussing the Indian scenario:

- *Electronic know your customer (e-KYC) enables fully digital onboarding, with stand-alone analytics checking customers' identities and conducting anti-money-laundering checks. Regulators can tailor identification methods based on their preferences.*
- *E-signature allows customers to validate most types of transactions remotely.*
- *Open banking offers network effects and fosters data sharing for better customer assessment and remote or automatic third-party transactions.*
- *Ecosystem opportunities help nonbanks compete and allow consumers to benefit from broader and more personalized services.*
- *Cloud hosting can resolve three pain points for banks: infrastructure scaling, access to next-generation application architecture solutions, and the need to meet local regulations, such as those concerning local data hosting and protection. The cloud also lowers barriers to entry by eliminating the need for upfront hardware purchases.*[26]

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[26] *Lessons from the rapidly changing regulation of digital banking,* McKinsey, https://www.mckinsey.com/industries/financial-services/our-insights/lessons-from-the-rapidly-evolving-regulation-of-digital-banking.

The Reserve Bank of India has given out various regulations for regulation of digital banking and fin-tech sector. It includes setting up and following the Electronic Funds Transfer System under the Electronic Funds Transfer Act 1995, encryption of messages transferred over PSTN line, admission of electronic files as evidence and preservation of records, funds transfer from EFT system from tax compliance angles, cheque truncation and legislation on netting. The key regulatory developments in the fin-tech sector are:

1. Digital Lending Guidelines: In September 2022, RBI released the Digital Lending Guidelines ("DL Guidelines"). The digital lending ecosystem comprises these participants:

   o *Banks & NBFCs (RBI regulated lenders)*: They are the backbone of the entire ecosystem as they provide the capital for lending. They form partnerships with fintech players, who provide them a distribution layer and access to the untapped credit market.

   o *Lending Service Providers*: Regulated lenders can outsource their certain functions to FinTechs which are called Lending Service Providers ("LSPs"). LSPs are basically agents of lenders that perform tasks like customer acquisition, loan recovery, underwriting, etc., on behalf of the lenders. The relationship between a regulated lender and LSP is governed by RBI's outsourcing framework. LSPs' credit evaluation algorithms helps lenders underwrite borrowers more accurately, reducing non-performing assets and building their loan-books. LSPs also enable speedier credit approval, lower the customer acquisition cost for the lenders and offer better customer experiences. All in all, LSPs help lenders build a larger and healthier loan book.

   o *Digital Lending Platforms/Apps*: Digital Lending Apps ("DLAs") are platforms that provide the user-facing interface and facilitate the digital lending services. DLAs may be that of the regulated entity or the LSPs engaged by the regulated entities.

   o The key principle in the DL Guidelines is that lenders must not outsource their core functions (such as balance sheet lending) to LSPs. LSPs can, however, provide

services to regulated entities like operating the DLA, customer acquisition support, recovery of loans, etc. [27]

2. First Loan Default Guarantee ("FLDG"): FLDG is a prevalent market practice in the digital lending ecosystem. It is a risk-sharing arrangement where FinTechs promise to compensate lenders for loan defaults. This gives lenders confidence to lend to customers with limited credit history. The legality of FLDG under the DL Guidelines was, however, unclear. After detailed consultation with the industry, the RBI, in June 2023, allowed FLDG. Fintech partners can now compensate lenders for defaults on up to 5% of the loan portfolio originated by them.[28]

3. RBI recognises that Regtech (Regulatory technology) and Suptech (Supervisory technology) have an important role to play in identifying and mitigating potential risks. In October 2022, RBI's Department of Supervision ("DoS") launched an advanced SupTech monitoring system – "Daksh". It monitors compliance and reporting by REs. It also enables seamless communication (between RBI and its regulated entities), inspection planning and execution, cyber incident reporting and analysis, etc. In the current financial year, RBI plans to further develop RegTech and SupTech tools using AI/ML technologies. It also plans to leverage these tools to increase the share of off-site (remote) supervision to 70–

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[27] Radhika Maheshwari, et. al., *Fintech Laws and Regulations*, GLOBAL LEGAL INSIGHTS, https://www.globallegalinsights.com/practice-areas/fintech-laws-and-regulations/india*; Legal Framework of electronic Banking,* RESERVE BANK OF INDIA, https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/7936.pdf*; Digital Payments in India: A guide to Regulatory Framework*, KING STUBBS AND KASIVA, https://ksandk.com/banking/digital-payments-in-india-regulatory-framework/; *Digital Banking*, NITI AYOG, https://www.niti.gov.in/sites/default/files/2023-02/Digital-Bank-A-Proposal-for-Licensing-and-Regulatory-Regime-for-India.24.11_0.pdf; *Lessons from the rapidly changing regulation of digital banking,* McKinsey, https://www.mckinsey.com/industries/financial-services/our-insights/lessons-from-the-rapidly-evolving-regulation-of-digital-banking; *Establishment of Digital Banking Units*, RESERVE BANK OF INDIA, https://www.rbi.org.in/scripts/NotificationUser.aspx?Id=12285&Mode=0; *Digital Banking Risk Management,* BANK OF BARODA, https://www.bankofbaroda.in/banking-mantra/digital/articles/digital-banking-risk-management; *RBI Bulletin*, RESERVE BANK OF INDIA, https://rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=22315#:~:text=The%20adoption%20rate%20of%20FinTech,USD%2050%20billion%20in%202021; Sergei Beck, *how artificial intelligence enhances banking sector*, FORBES, https://www.forbes.com/sites/forbestechcouncil/2024/02/23/how-artificial-intelligence-is-reshaping-banking/; VALENTINO ALTO, MODERN GENERATIVE AI WITH CHAT GPT AND OPEN AI MODELS: LEVERAGE THE CAPABILITIES OF OPEN AI's LLM FOR PRODUCTIVITY AND INNOVATION WITH GPT3 AND GPT4 (2023); *What is Artificial Intelligence in Finance*, IBM, https://www.ibm.com/topics/artificial-intelligence-finance; *How Artificial Intelligence is transforming the financial services industry*, DELOITTE, https://www.deloitte.com/ng/en/services/risk-advisory/services/how-artificial-intelligence-is-transforming-the-financial-services-industry.html.
[28]*Ibid.*

75% in the next three to five years. Currently, only 10–15% of supervision is carried out off-site.[29]

4. In April 2022, SEBI constituted an "advisory committee on leveraging regulatory and technology solutions" ("AleRTS"). A key goal of ALeRTS is to ascertain the adequacy of SupTech and RegTech tools that SEBI intends to use. SEBI also uses different technological tools to analyse bulk data on social media and news channels to identify cases of market manipulation. For instance, to track stock recommendations given through TV shows, SEBI has developed an AI-based monitoring tool – "Picture-based Information News Accumulator and Key Information Analyser" ("Pinaka"). Pinaka scans through the TV shows that display stock tips. Next, it compares the data with the trading patterns of the person giving the tips to identify violations of securities market regulations.[30]

5. Payment and Settlement Systems Act, 2007 ("PSS Act"): The PSS Act governs the operation of "payment systems" in India and empowers the RBI to regulate them. A "payment system" enables payment to be made between a payer and a beneficiary. To operate a payment system, an entity must obtain prior RBI authorisation. Examples of payment systems are PPIs and PA services.[31]

6. Regulations that govern PSPs:
   o Master Direction on PPIs, 2021 ("PPI Directions"): The PPI Directions govern the issuance and operation of PPIs. It classifies them into three categories: (a) closed PPIs; (b) small PPIs; and (c) full-KYC (Know Your Customer) PPIs. Closed PPIs are not regulated by the RBI. However, to issue small and full-KYC PPIs, a non-bank PPI issuer must obtain prior RBI authorisation.
   o Guidelines on Regulation of PAs and Payment Gateways, 2020 ("PA Guidelines"): Non-bank PAs require RBI authorisation to operate. The PA Guidelines prescribe authorisation process and eligibility criteria for non-bank PAs. PAs must have a minimum net-worth of Rs. 15 crores when they apply for the authorisation. [32]

[29] *Ibid.*
[30] *Ibid; Digital Banking*, NITI AYOG, https://www.niti.gov.in/sites/default/files/2023-02/Digital-Bank-A-Proposal-for-Licensing-and-Regulatory-Regime-for-India.24.11_0.pdf.
[31] *Ibid;* Radhika Maheshwari, et. al., *Fintech Laws and Regulations*, GLOBAL LEGAL INSIGHTS, https://www.globallegalinsights.com/practice-areas/fintech-laws-and-regulations/india/.
[32] *Ibid.*

7. Regulations that govern digital lending
   o Master Directions – Non-Banking Financial Company – Peer to Peer Lending Platform (Reserve Bank) Directions, 2017 ("P2P Guidelines"): The platform that enable individuals and entities (which are not RBI-regulated lenders) to offer loans to other individuals, are regulated under the P2P Guidelines.
   o The DL Guidelines are discussed in Section A ("Approaches and developments").[33]
8. Master Direction on Digital Payment Security Controls 2021 ("Security Directions"): The Security Directions prescribe that RBI regulated entities such as banks, and credit-card issuing NBFCs must (a) have a robust governance framework for digital payment products and services, (b) implement minimum security control standards, and (c) conduct risk assessments.
9. Master Direction – KYC Direction, 2016: RBI-regulated entities must conduct KYC of their customers as per these directions.
10. NPCI releases circulars to prescribe rules for members that participate in its retail payment systems.
11. Wealthtech services such as copy-trading may, depending on the nature of services, be regulated under the Securities and Exchange Board of India (Investment Advisers) Regulations, 2013 or Securities and Exchange Board of India (Research Analysts) Regulations, 2014. The wealth-techs that offers stock broking services are regulated under the Securities and Exchange Board of India (Stock-brokers) Regulations, 1992. [34]
12. The regulations that may apply to insurtechs like corporate agents and web-aggregators are the IRDAI (Registration of Corporate Agents) Regulations, 2015, and IRDAI (Insurance Web Aggregators) Regulations, 2017.[35]

However, there are several challenges and loopholes still persisting in the whole framework, but these are reversible and can be legally addressed in a positive manner. Policy making and finance-related regulations are complex processes and there can be several areas of loopholes. These can

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[33] *Ibid.*
[34] *Ibid;* Radhika Maheshwari, et. al., *Fintech Laws and Regulations*, GLOBAL LEGAL INSIGHTS, https://www.globallegalinsights.com/practice-areas/fintech-laws-and-regulations/india/.
[35] *Ibid; Digital Banking*, NITI AYOG, https://www.niti.gov.in/sites/default/files/2023-02/Digital-Bank-A-Proposal-for-Licensing-and-Regulatory-Regime-for-India.24.11_0.pdf.

be intentional or unintentional and can occur due to lack of transparency, inadequate enforcement, or bureaucratic red tape. The solutions that can universally and in a generalized manner, that can address the existing loopholes, along with loopholes must be studied in detail. The Payment and Settlement Act 2007, Prevention of Money Laundering Act 2002, Master Directions- NBFC P2P Lending Platforms Directions 2017, Master Directions on Digital Payment Security Controls, 2021, It Act 2000, The Indian Digital Data Protection Act 2023, are a few regulations that deal with online or virtual reality. A simple offence committed virtually can fall under any or all of these laws, but the question of superiority or organisational authority always rises. This causes serious conundrums and if it does so, it can lead to complex grievance redressal mechanisms and failure or miscarriage of justice. The government can effectively take active steps to address these problems. It can define the basic economic or financial offences clearly and also define the scope of all these Acts, along with categorizing the kind of offences that these Acts can deal with. This will, not only aid the justice delivery mechanisms but also help the Central government in clearing its own balance sheet by putting offenders behind bars. It is a preventive as well as a punitive measure that can be taken up. However, the most effective step that can be taken is bringing all the rules and regulation related to fin-tech, digital banking, online transactional systems under the same umbrella legislation for effective formulation of laws and friction-free implementation of the same.

According to the data released by the Reserve Bank of India (RBI), in the fiscal year 2023, the Reserve Bank of India (RBI) was confronted with a grave issue of payment fraud, surpassing a staggering 302.5 billion rupees. While 3,596 frauds, amounting to 155 crore using cards and internet banking services, were reported in FY22, the volume nearly doubled to 6,659 digital frauds in FY23, amounting to 276 crore. *However, 94.5% of the frauds reported in FY23 by value occurred in previous financial years, and there were delays in identifying fraud and subsequent lag in reporting by lenders.*[36]

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[36] *Card and internet frauds rise sharply*: RBI, INDIAN EXPRESS, https://indianexpress.com/article/business/banking-and-finance/card-internet-frauds-rise-sharply-rbi-data-9085487/.

**FIGURE 9: DIGITAL PAYMENTS FRAUD 2023**
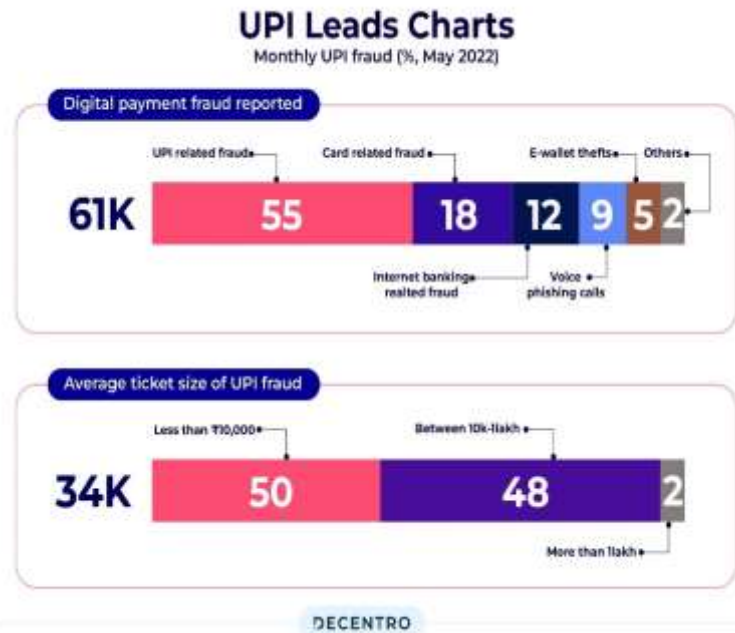
The extent of frauds that are committed in online/ virtual platform transactions are obviously and will always be more than the offline market because of the volatility that is attached to the platform itself, However, the recent Data Protection Act and the privacy rulings of the Apex Court of India (Puttaswamy Case 2017)[37], must always be kept in mind when any Act is formed for the protection of people and their money in the online transactional market. This is also important because the pace of digital transactions is always going to increase and never going to decrease. Thus, the Act can specifically form a segment of online frauds or digital payment frauds to deal with the same, with better clarity. The human resource for the development of better equipped cyber security personnel must be built up, without any excuse or delay. The same workforce must be taught about all the laws that are associated with the digital payments market system or digital banking. The Central Government has already formed the Indian Cybercrime Coordination Centre (IC4) and CERT-in is also working on its own pace, but the same is incomplete without the efficient workforce.

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[37] Justice (Retd.) K.S. Puttaswamy v Union of India (2017).

Certain other steps can also be followed for bringing in more stability and regulation in the sector. FinTechs should first identify all of the laws and regulations that are applicable to their business. This can be done by onboarding full-service law firms. FinTechs should develop a compliance program to ensure that they are complying with all applicable laws and regulations. This program should include policies and procedures for managing risk, conducting due diligence on customers and counterparties, and reporting suspicious activity to the authorities. FinTechs should collaborate with the authorities on a regular basis to learn about new and emerging regulations and to discuss any compliance challenges they may be facing. Additionally, FinTechs should participate in industry consultations on any proposed regulations, their inputs and expertise on the subject matter can ensure a fair equitable regulation of the industry.[38]

# IV.  CONCLUSION

Conclusively speaking, digital banking and the fin tech sectors, although fraught with dangers is not a sector whereby reforms cannot be brought in. The sector has positive implications that can help in bringing India to a full-fledged digital platform in the world. The regulatory mechanism that has been bought forth by the Central Bank and the Central Government is sure to reap benefits in the future. However, the same must be zealously followed and upheld according to natural justice and principles of law, that are followed in the country. The Apex Court guidelines that are given in any particular case must also be followed and a harmonious balance must be maintained between both the extremes of law and economics so that the country can progress, without any hiccups on the path of rapid economic and human development platforms. This alone, is sure to make India the top most economically viable country for investors, bankers, brokers, and the common man. Shared responsibility to make digital platform the safest of all, is necessary and inevitable to fulfill the dreams of billions of Indians, gradually.

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[38] Navigating Regulatory Framework in India's FinTech Sector, https://www.legal500.com/developments/thought-leadership/navigating-regulatory-hurdles-in-indias-fintech-landscape/.