

FINTECH: A Digital Disruption in Indian Banking System

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Abstract

India has the highest Fintech adoption rate in the world – at 87 percent – and significantly higher than the global average rate of 64 percent. India is amongst the fastest growing fintech markets in the world and there are 6,636 FinTech startups in India. Indian FinTech industry's market size is \$50 billion in 2021 and is estimated at \$ 150 billion by 2025. Over the past few years, the business of banking has witnessed a shift from traditional branch banking to digital banking. The finance minister in the budget address for FY-23 announced the proposal to establish “Digital banking Units” (“DBUs”) of scheduled commercial banks in 75 districts with objectives to ensure the benefits of digital payments, banking and fintech innovations reach the grass-roots of India in a consumer-friendly manner (Niti Ayog, 2022). The Indian market is blessed with a higher proportion of young population, who are more likely to trust and adopt FinTech. This paradigm shift has been possible due to innovations in information technology (IT), growth in mobile and internet connectivity, market-based financial intermediation, and the advent of Fintech. The use of algorithms, big data, blockchain, peer-to-peer lending and crowdsourcing, means that the role of the intermediary is changing: banks now face competition from other intermediaries in their core business. Improvements in technology have also enhanced the cause of financial inclusion and tech-enabled public goods delivery. Digital-mobile, anywhere-anytime banking is becoming the order of the day. The indigenously developed Unified Payments Interface (UPI) and Aadhaar Enabled Payment Service (AePS) have become the backbone of our retail payments system (RBI, 2017). Different components of digital disruptions in banking are investment management, data driven credit rating, Mobile points of sale, mobile payments & e-wallets, P2P payment, P2P lending, dynamic pricing, comparison engines, mobile insurance, mobile banking and personal finance management. The challenges created by fintech in banking sector are concentration risk, systemic risk, market power, regulatory arbitrage, customer protection, data privacy and cyber security which create hurdles for delivery of banking services smoothly. Licensing, requirement of paid-up capital, registration with RBI, disclosure of accounts, compulsory auditing of accounts, compliance with RBI guidelines, data protection guidelines are some of such initiatives of Reserve Bank of India to minimize the fintech induced risks by regulating the digital activities of banks and other financial institutions.

Keywords: *Digital disruption, fintech, banking system, neo-bank, RBI, India*

JEL Classification: E50

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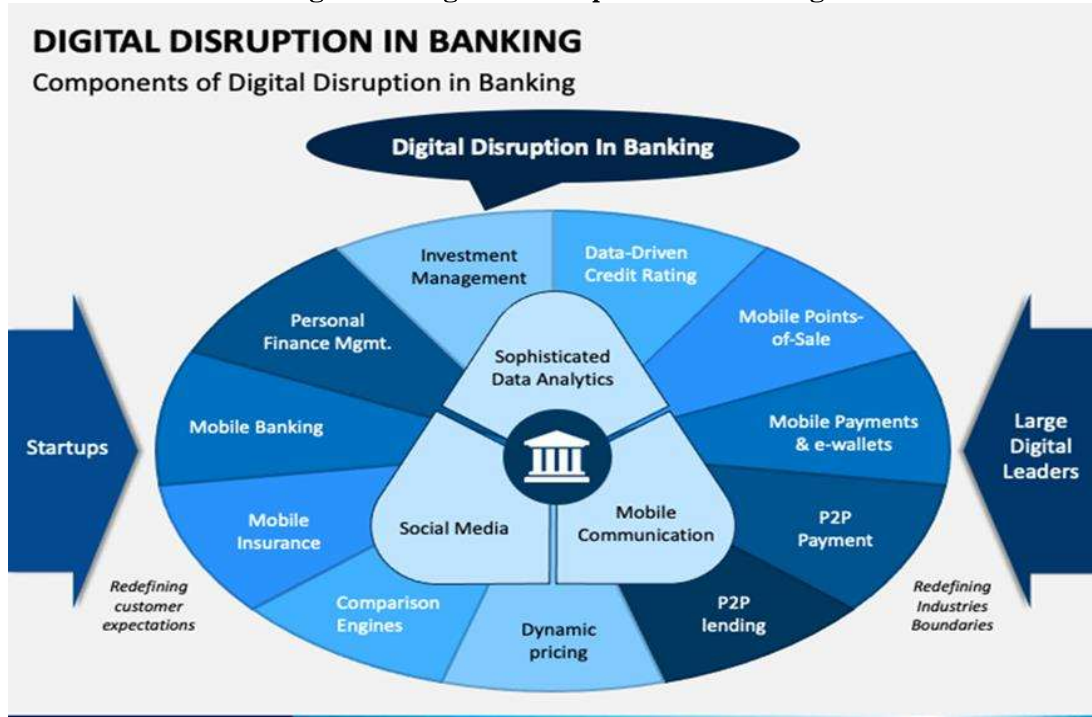
Introduction

"Digital innovation is redefining industries and changing the way business' function. Digitisation and innovative technologies are creating unprecedented disruption in the banking sector and the rate of change is accelerating," State Bank of India's Chairman Dinesh Khara.

Digital disruption is an effect that changes the fundamental expectations and behaviors in a culture, market, industry or process that is caused by, or expressed through, digital capabilities, channels or assets. Digital disruption is changing the provision of services in the sector, but may also be solving some of the previous competition problems in financial markets, such as high switching costs, or high transaction costs (OECD). India has emerged as a leader in the digital revolution taking place globally but there are few credible estimates on the size of digital economy which hampers evidence-based policy making. India's core digital economy (hardware, software publishing, web publishing, telecommunication services, and specialized and support services) increased from 5.4 per cent of Gross Value Addition (GVA) in 2014 to 8.5 per cent in 2019. Including the sectors that have witnessed digital disruptions, the share of digitally dependent economy hover around 22 per cent in 2019. India's digital economy grew 2.4 times faster than the Indian economy, with strong forward linkages to the non-digital sectors. The digital output multiplier has increased over time, highlighting the role of digital economy investments to drive growth (RBI Bulletin, 2022). Over the past few years, the business of banking has witnessed a shift from traditional branch banking to digital banking. This paradigm shift has been possible due to innovations in information technology (IT), growth in mobile and internet connectivity, market-based financial intermediation, and the advent of Fintech. Financial service providers are now devising new products and services and are adopting new business models for reaching out to the target customers. Retail banking is no longer solely branch-based, but can be conducted in many ways, including using mobile telephones. Banks have had to adapt their business models to deal with persistently low interest rates, low credit growth, and increasing competition in retail from FinTech and platform-based competitors, all which threaten the profitability of traditional banks. The use of algorithms, big data, blockchain, peer-to-peer lending and crowdsourcing, means that the role of the intermediary is changing: banks now face competition from other intermediaries in their core business. Improvements in technology have also enhanced the cause of financial inclusion and tech-enabled public goods delivery. Direct Benefit Transfer (DBT) through the digital mode is among the best examples of tech-enabled public goods delivery. Digital-mobile, anywhere-anytime banking is becoming the order of the day. The indigenously developed Unified Payments Interface (UPI) and Aadhaar Enabled Payment Service (AePS) have become the backbone of our retail payments system (RBI, 2017). Different components of digital disruptions in banking (figure 1) are investment management, data driven credit rating, Mobile points of sale, mobile payments & e-wallets, P2P payment, P2P lending, dynamic pricing, comparison engines, mobile insurance, mobile banking and personal finance management.

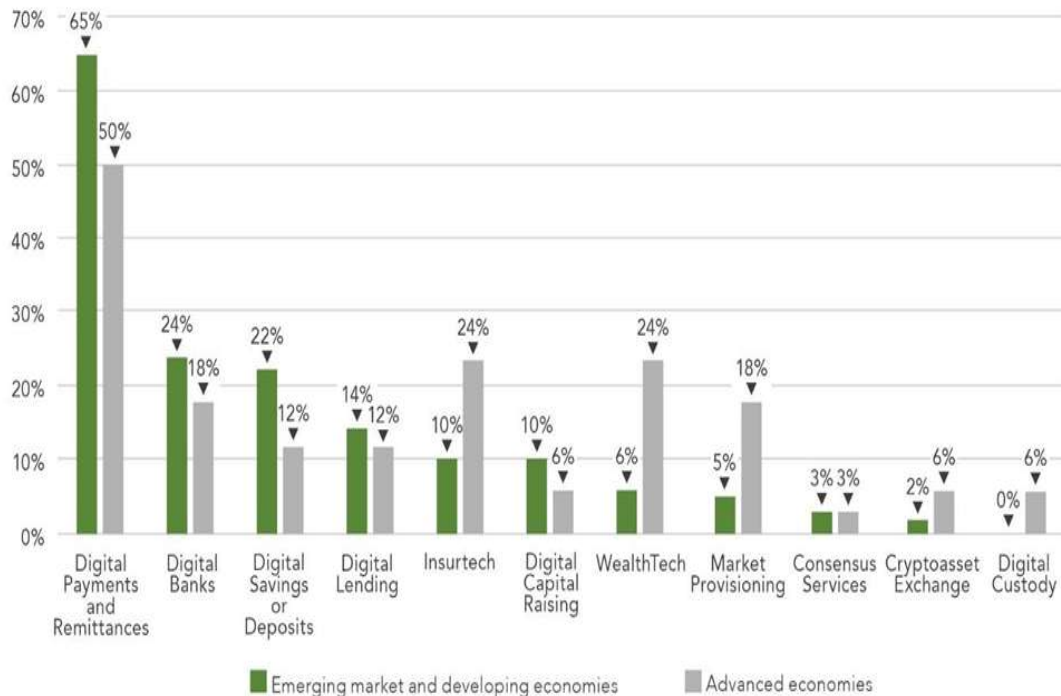
The figure 2 highlights emerging fintech market of advanced and developing economies of the world. It reveals that digital payments and remittances contributes highest share in emerging fintech market of both the economies i.e., 65 per cent in developing economies and 54 per cent in advanced economies. Digital banking (24 per cent), digital savings and deposits (22 per cent), digital lending (14 per cent) are also some of the emerging sectors of digital disruptions of developing counties. In case of developed economies digital banks (18 per cent), digital savings and deposits (12 per cent), digital lending (12 per cent), insure-tech (24 per cent), wealth-tech (24 per cent), market provisioning (18 per cent) etc. are some of the leading emerging areas of digital disruption.

Figure 1: Digital Disruption in Banking



Source: cdn.sketchbubble.com

Figure 2: Emerging Fintech Market of Developing and Advanced Economies



Source: World Economic Forum, 2020

Conceptual Framework Fintech Industry in India

FinTech is generally described as an industry that uses technology to make financial systems and the delivery of financial services more efficient. It is “technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services” (FSB, 2019). FinTechs are “start-ups and other companies that use technologies to conduct the fundamental functions provided by financial services, impacting how consumers store, save, borrow, invest, move, pay, and protect money” (McKinsey, 2016). The information and telecommunications (IT) revolution is regarded as the fifth ‘Technological Revolution’ driving growth and FinTech is at the helm of this creative disruption (Hendrikse et al., 2018). In India, FinTechs and digital players could function as the fourth segment of the Indian financial system, alongside large banks, mid-sized banks including niche banks, small finance banks, regional rural banks and cooperative banks (Das, 2020). The key enabling technologies used by fintechs are API (Application Programming Interface), Cloud Computing, Biometrics, DLT (Distributed Ledger Technology), Big Data, AI (Artificial Intelligence) & ML (Machine Learning) (mentioned in table 1).

Table 1: Key Enabling Technologies used by FinTechs

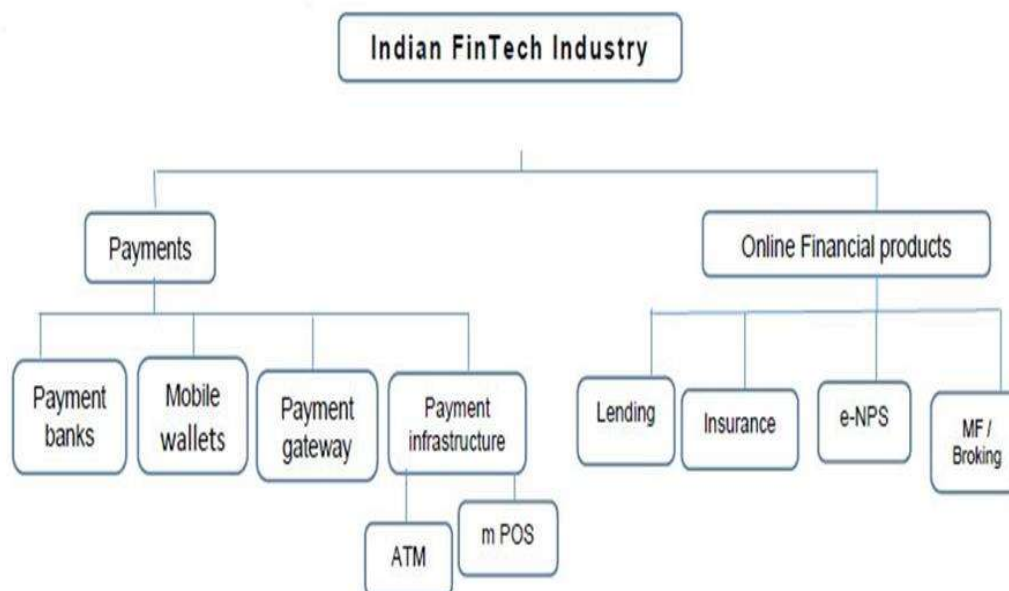
Technology	Description
API (Application Programming Interface)	APIs comprise a set of rules and specifications that software programmes use to communicate with each other. They allow new applications to be built on top of others.
Cloud Computing	The use of an online network (‘cloud’) of hosting processors to increase the scale and flexibility of computing capacity, generating cost savings.
Biometrics	The study of distinctive and measurable human characteristics that can be used to categorize and identify individuals.
DLT (Distributed Ledger Technology)	A digital system for recording the transaction of assets in which details are recorded in multiple places at the same time
Big Data	Voluminous amounts of structured or unstructured data that can be generated, analysed and utilized by digital tools and information systems.
AI (Artificial Intelligence) & ML (Machine Learning)	IT systems that can perform functions that would otherwise require human capabilities. ML entails computers learning from data without human intervention.

Source: RBI Bulletin November 2020

The key enabling factors for fintech revolution include the Digital India initiative, a conducive policy environment, and the presence of a sizeable talent pool (India Briefing, 2021). The hallmark of India’s FinTech ecosystem is diversity of markets and applications. Though concentrated in major metropolitan cities such as Mumbai, Bangalore, Delhi-NCR, and Hyderabad, FinTech is also expanding to smaller cities. Mumbai and Bangalore lead the FinTech momentum and account for 42 per cent of the startup headquarters. Other cities like Jaipur, Pune, and Ahmedabad are also emerging as centers of FinTechs (Medici & Pisabazaar: India FinTech Report 2019). The figure 3

depicts that fintech industry of India comprises of two segments- payment and online financial products. The payment segment consists of payment banks, mobile wallets, payment gateway and payment infrastructure. The online financial products comprise lending, insurance, e-NPS, mutual fund/broking.

Figure 3: Fintech Industry in India



Source: Annual Report, RBI (2018)

India is amongst the fastest growing Fintech markets in the world and there are 6,636 FinTech startups in India. Indian FinTech industry's market size is \$50 billion in 2021 and is estimated at \$ 150 billion by 2025. India's payment landscape over the last decade has developed into the most advanced payment system with regards to digital payments by volume (CAGR 50 per cent) and value (CAGR 6 per cent). The Fintech transaction value size is set to grow from US\$ 66 billion in 2019 to US\$ 138 billion in 2023, at a CAGR of 20 (per cent). The Indian Fintech industry ecosystem sees a wide range of subsegments, including Payments, Lending, Wealth Technology (WealthTech), Personal Finance Management, Insurance Technology (InsurTech), Regulation Technology (RegTech), etc. The Fintech sector in India has seen a funding of \$8.53 billion (in 278 deals) in FY22. As of May 2022, India's Unified Payments Interface (UPI) has seen participation of 323 banks and has recorded 5.9 billion monthly transactions worth over \$130 billion. As of June 2022, India has 23 Fintech companies, which have gained 'Unicorn Status' with a valuation of over \$1 billion. The Fintech segment in India has seen an exponential rise in funding over the last few years, investments worth more than \$8 billion have already been witnessed across various stages of investment in 2021. While Payments and Alternative Finance segments constituted more than 90 percent of the sector's investment flows in 2015, there has been a major shift towards a more equitable distribution of investment across sectors since to include InsurTechs, WealthTechs, etc. India has 23 Fintechs which have gained 'Unicorn Status'. 1/5th Startup Unicorns are from Fintech India recorded the largest absolute number of real-time transactions in the world. India's real-time transactions crossed 48 billion, which is 6.5 times of the combined volume of the world's leading economies: U.S., Canada, U.K., France and Germany in 2021, resulting in cost savings of USD 12.6 billion for Indian businesses and consumers in 2021. The Indian FinTech industry grew 282 per cent between 2013 and 2014, and

reached USD 450 million in 2015. At present around 400 FinTech companies are operating in India and their investments are expected to grow by 170 per cent by 2020. The Indian FinTech software market is forecasted to touch USD 2.4 billion by 2020 from a current USD 1.2 billion, as per NASSCOM. The transaction value for the Indian FinTech sector is estimated to be approximately USD 33 billion in 2016 and is forecasted to reach USD 73 billion in 2020 (RBI).

Fintech in Banking Industry of India

The finance minister in the budget address for FY-23 announced the proposal to establish “Digital banking Units” (“DBUs”) of scheduled commercial banks in 75 districts with objectives to ensure the benefits of digital payments, banking and fintech innovations reach the grass-roots of India in a consumer-friendly manner (Niti Ayog, 2022). The landscape of banking and financial sector has undergone a phenomenal transformation since 2008 Global Financial Crisis (GFC), owing to financial technology firms, popularly known as ‘FinTechs. FinTechs have contributed to the modern banking and financial sector through various channels including cost optimisation, better customer service and financial inclusion (RBI, 2020). FinTechs have played an important role in unbundling banking into core functions of settling payments, performing maturity transformation, sharing risk and allocating capital (Carney, 2019). Technology is leveraged in banking segment through establishment of digital subsidiary of banks, retail neobanks as well as SME (small and medium enterprise) neobanks. Neobanks are basically digital platforms for business banks. The Fintech services employed in digital banking include conversational platforms, account aggregators, API providers and aggregators, banks with open APIs, banking as a service and core banking. Financial technology disruption is a massive shift in the banking service, from traditional banking to neobanks. Beyond offering banking services, neobanks have also helped users invest in stocks & crypto—niche, [creating a platform for stock trading](#) that traditional financial institutions are unwilling to try. Yono, Kahatabook, and Crazybee are some of the major firms with primary engagement in digital banking. Fintech brings paradigm shift in the banking service delivery system of world and also in India as well. Digital subsidiary of banks, retail neobanks (digital platform of neobanks), SME (small and medium enterprise) neobanks are some of the outcomes of fintech enabled services in banking sector. The Fintech services employed in digital banking include conversational platforms, account aggregators, API providers and aggregators, banks with open application open software (API), banking as a service and core banking. Further, Yono, Kahatabook, and Crazybee are some of the major firms that primarily engaged with digital banking. Fintech firms are breaking new ground in the formal finance sector through innovative and dynamic use of technology in the lending process. For instance, while traditional banks (around 100) and NBFCs (around 1100) in India use technology to simply calculate credit scores, fintech ventures use machine learning algorithms and alternative data points such as social media footprints, call records, shopping histories, and payments to utility service providers to increase efficiency and provide greater access to credit. The turnaround time is also much faster for the approval and disbursement of loans by fintech firms despite several banks (State Bank of India, ICICI, HDFC, and Axis bank) digitizing and speeding up these processes markedly. FinTech platform financing is further bifurcated under following sub-categories:

- **FinTech balance sheet lending:** This has been defined as electronic platforms using their own balance sheet in the ordinary course of business to intermediate between borrowers and lenders.
- **Crowdfunding:** This has been defined as matching persons/ entities needing funds with those who are willing to provide these funds for a financial return. Depending on the type of funding, it is further distinguished between loan

crowdfunding and equity crowdfunding. Crowdfunding facilitates establishment of individual contracts between those seeking funds and those seeking to invest/lend, and the platform, by itself, does not undertake risk transformation.

Additionally, some of the fintech induced banking services are-

- **PayTech:** In this segment, the consumer centric services offered include third party application providers (TPAP), prepaid card/Wallet, bill payment, QR code payment, payment aggregator, point of sale (POS). Business centric services include corporate cards, B2B payments and invoice payments. In this segment, Fintech comes into play through use of services like payment gateway, card networks, application programming interface (API)/White label solutions, as well as payment security. Paytm, PhonePe, MobiWik, and Google Pay are the major players in this segment.
- **LendTech:** The consumer centric services offered in this segment include buy now pay later (BNPL), personal loan, salary loan, gold loan, auto loan, education loan, and P2P lending while the business centric services include corporate card, fixed term finance, as well as trade finance. Fintech services employed in this segment include collections management, credit bureau, alternate credit scoring, lending as a service and loan origination system (LOS) and loan management system (LMS). Google Pay, M-Swipe, and Razor Pay are emerging as leading lending platforms for consumers as well as merchants (India briefing, June 9, 2022).

Objectives of the Study

The present study is conducted with the following objectives-

- i. To study the trend of fintech in Indian Banking system;
- ii. To examine the challenges of fintech in Indian Banking system.

Research Methodology

The present research is descriptive in nature. The data is collected and compiled from secondary sources like annual reports of Reserve Bank of India, related research reports of Securities and Exchange Board of India, NITI Ayog, India Fintech report, Bank for International Settlement, CFA institute research foundation, World Economic Forum, International monetary fund working paper and also research articles of related fields. Data are presented in tables and charts. Discussions are made from data provided in the tables and charts.

Results and Discussion

This discussion segment of the present study highlights the explanations objective wise-

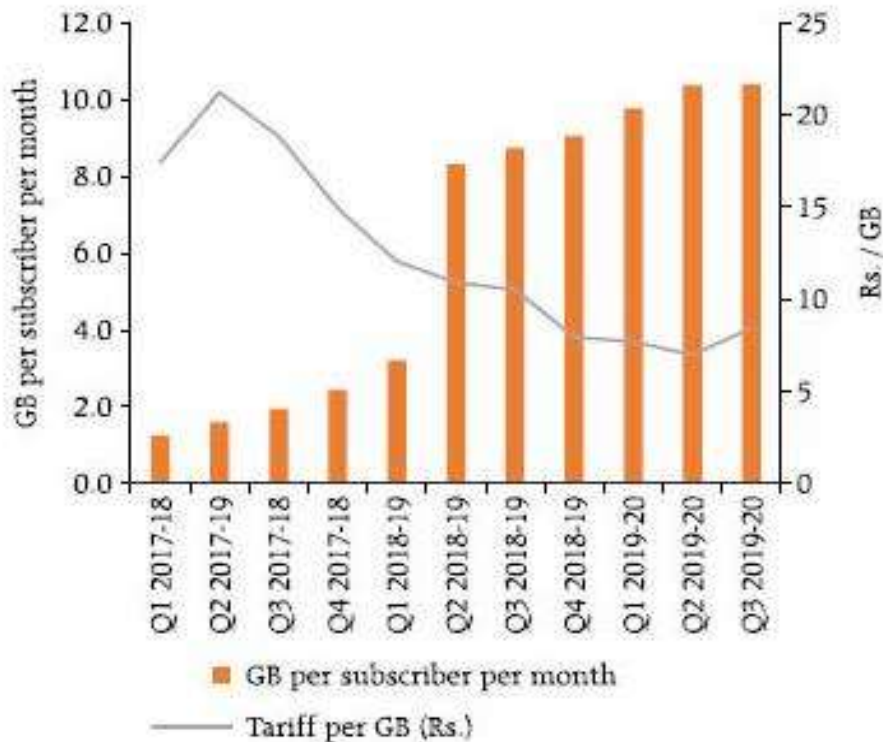
Objective 1: Trend of fintech in Indian Banking system

The table 2 and figure 4 highlights there is massive development in use of internet and smartphone during the year 2019-20. It further helps in expansion of fintech market in India. The Indian market is blessed with a higher proportion of young population, who are more likely to trust and adopt FinTech. There were 1157.75 million wireless subscribers in the country as on March 31, 2020, comprising 638 million urban and 519 million rural subscribers (TRAI, 2020). India and China lead the Global FinTech Adoption Index 2019 with an adoption rate of 87 per cent.

Table 2: Telecommunication Indicators

Parameter	Period	Cumulative amount
Telephone Subscribers	31-Mar-14 to 30-Apr-20	116.8 Crore
Teledensity	31-Mar-14 to 30-Apr-20	86.6 %
Internet Subscribers	31-Mar-14 to 31-Mar-20	74.3 Crore
Broadband Subscribers	31-Mar-14 to 31-Mar-20	68.7 Crore
Wireless Data Usage	Q3 2019-20	21,402 Petabytes
Telecom Usage (Monthly Wireless Average Revenue per User)	31-Mar-14 to 31-Dec-19	₹ 78.7
Telecom Towers	01-Sep-17 to 27-Jul-20	6,05,788
Gram Panchayats connected under BharatNet	31-Aug-14 to 30-Jun-20	1,41,098
Telecom Licenses	31-Mar-14 to 30-Jun-20	156

Source: Department of telecommunications, GOI (2020)

Figure 4: Wireless data usage and tariff

Source: Department of telecommunications, GOI (2020)

The Indian market is blessed with a higher proportion of young population, who are more likely to trust and adopt FinTech. The table 3 shows figures of top 10 countries of the world where adults goes for digital bank account in 2022 and also projection figures for the year in 2027. Here, India ranks second position in case of adults with digital only bank account with 26 per cent in 2022 and forecasted 46 per cent in 2027.

Table 3: The percentage of adults with a digital only bank account in 2022 and the percentage that will have one by 2027

Country	2022 (in per-cent)	2027 (in per-cent) (forecast)
Brazil	43	57
India	26	46
Ireland	22	34
Singapore	21	35
Hong kong	20	32
United Arab Emirates	19	41
Mexico	17	41
Spain	17	31
South Africa	15	31
Germany	15	24

Source: Finder (neo-bank adoption), 2022

The table 4 highlights figures (in per cent) of country wise gender gap in case of adoption of digital banking. Hong kong and UAE has the highest gender gap of 9 per cent, followed by 8 per cent of gender gap in Mexico, Singapore and Spain, 6 per cent of gender gap in Brazil and India, 5 per cent of gender gap in South Africa and Ireland, lowest in United States (4 per cent). Such gender divided in digital banking adoption between male and female in Indian society is due to traditional and cultural norms, economic dependency and income inequality, lack of technical literacy and skill, patriarchal mindset etc.

Table 4: Countries and regions with the biggest digital only banking gender gap

Country	Men (in percent)	Women (in percent)	Gap (in percent)
Hong Kong	25	16	-9
United Arab Emirates	21	12	-9
Mexico	22	13	-8
Singapore	25	17	-8
Spain	21	13	-8
Brazil	46	40	-6
India	29	23	-6
South Africa	18	12	-5
Ireland	25	19	-5
United states	10	6	-4

Source: Finder (neo-bank adoption), 2022

The table 5 shows the country wise and region wise adoption of digital banking by different age group. In case of India, 33 per cent falls under age group of 18-24, 29 per cent falls under the age group of 25-34, 27 per cent falls under the age group of 35-44, 24 per cent falls under the age group of 45-54, 15 per cent belongs to the age group of 56-64 and 24 per cent belongs to 65+ age group as users of digital banking. Brazil (47 per cent), Singapore (39 per cent), India (33 per cent) and UAE (31 per cent) are the leading countries where digital banking is popularly adopting by youths of 18-24 age group.

Table 5: Countries and regions with the biggest digital only banking by age

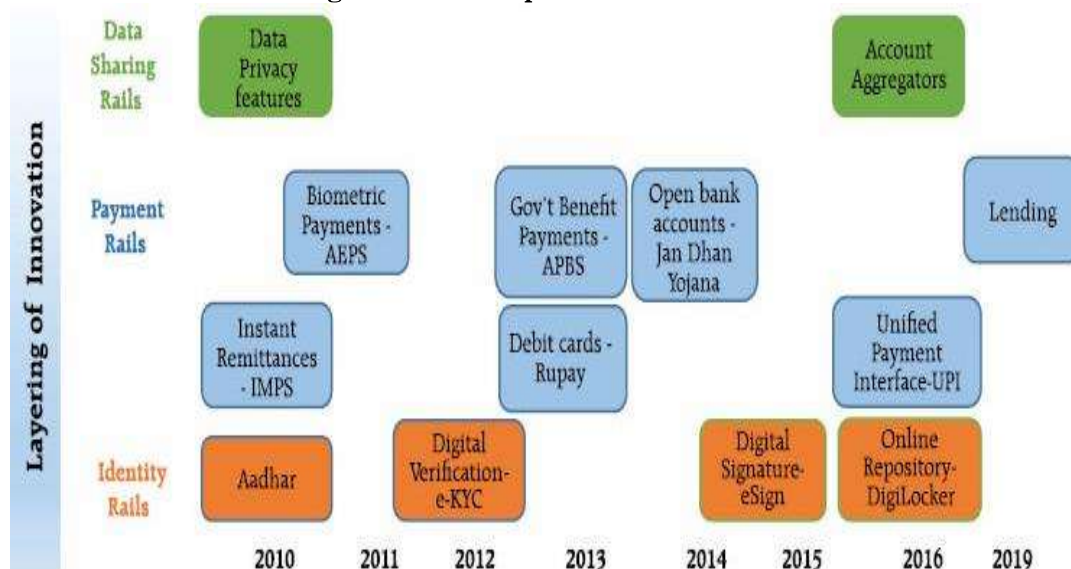
Country	18-24 (%)	25-34 (%)	35-44 (%)	45-54 (%)	55-64 (%)	65+ (%)
Brazil	47	55	46	41	30	28
Malaysia	20	14	12	14	12	6
Philippines	12	15	16	15	7	4
Ireland	28	34	27	18	17	12
Mexico	17	22	19	19	11	15
Hong Kong	21	21	22	18	18	20
Singapore	39	26	22	22	19	7
United Arab Emirates	31	21	14	16	10	19
Germany	16	15	17	16	14	12
Spain	22	17	17	16	20	13
South Africa	14	15	18	13	17	10
India	33	29	27	24	15	24
United States	11	11	8	7	5	5
Portugal	22	14	16	14	14	11

Source: Finder (neo-bank adoption), 2022

India's evolution as a progressive FinTech nation happened on the back of the 'India Stack' – an indigenous set of technologies and policies that act as enablers to innovation (RBI). The 'India Stack' encompasses two core principles - building digital platforms as public goods and incorporating data privacy and security in the design of digital public goods (D'Silva et al., 2019). As shown in figure 5, the cornerstone of the India Stack is the Aadhaar enabler, used to access a unique, verifiable identity at low marginal cost by FinTechs. Over 1.25 billion residents of India have been issued Aadhaar, and 30 million authentication requests are processed daily (UIDAI, 2019). Various publicly provided platforms for verification (e-KYC), digital signature (e-sign), cloud storage (DigiLocker) and payments have been developed over Aadhaar, which can be used by innovators to create and exchange value, obviating the need to build their own digital infrastructure. Unified Payments Interface (UPI) is a pivotal enabler, which virtualizes accounts and facilitates customers to undertake merchant payments and fund transfers.

The Indian FinTech market currently stands as the third largest FinTech ecosystem in the world behind the US and China. However, India still remains an untapped market due to lower penetration of financial services. These untapped opportunities, along with a favourable ecosystem, create large growth potential for FinTechs in India. The figure 6 depicts fintech business models developed in India over a period. These fintech business models are payments and transaction companies, lending companies, wealth and brokerage, insurance companies, neo-banks and multi-companies.

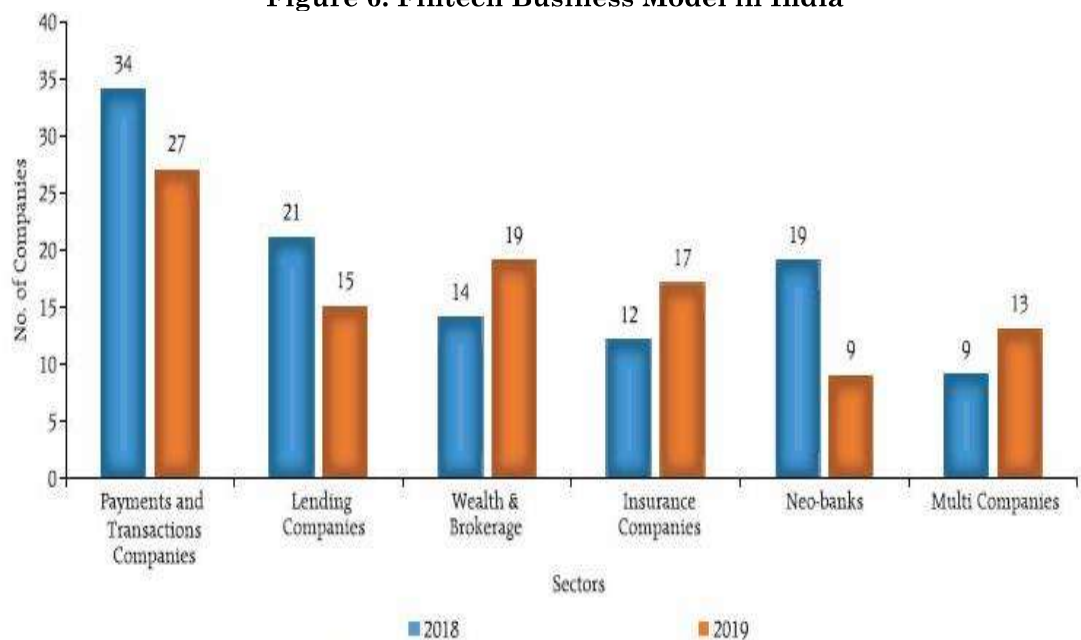
Figure 5: Development of Indian Stack



Source: RBI Bulletin, November, 2020

The table 6 and table 7 highlights the payment modes and channels and payment infrastructure of Indian banking system respectively. As mentioned in table 6 during the FY 2021-22 the figures of mobile app-based payment is Rs. 5068421.31 lakhs, Net banking is Rs. 40726.59, cash withdrawals at ATM using debit card, credit card and prepaid card is Rs. 65240.43, Cash withdrawal at point of sale (POS) using debit and credit card is Rs. 91.17 lakhs.

Figure 6: Fintech Business Model in India



Source: RBI Bulletin, 2020

The figures of different payment infrastructure of banking system of India like debit card, credit card, digital wallets, ATM, PoS terminals, Bharat QR, UPI QR are quite big (Table 7). As highlighted in table 7, in March 2022, the figures of payment using card is Rs. 9912.93 lakhs, digital wallets are Rs. 12787.93, ATMs are Rs. 2.52 lakhs, PoS terminals are Rs. 60.70 lakhs, Bharat QR are Rs. 49.72 lakhs and UPI QR are Rs. 1727.34 lakhs.

Table 6: Payment modes and channels

System	Volume (Lakh)				Value (₹ Crore)			
	FY 2021-22	2021	2022		FY 2021-22	2021	2022	
		Oct.	Sep.	Oct.		Oct.	Sep.	Oct.
	1	2	3	4	5	6	7	8
A. Other Payment Channels								
1 Mobile Payments (mobile app based) (1.1 to 1.2)	506842.31	45884.20	72862.29	78248.46	14961371	1353833	1882943	1981406
1.1 Intra-bank \$	40805.69	3761.40	5133.31	5473.11	2726363	243728	348416	351595
1.2 Inter-bank \$	466036.62	42122.80	67728.99	72775.35	12235007	1110105	1534526	1629812
2 Internet Payments (Netbanking / Internet Browser Based) @ (2.1 to 2.2)	40726.59	3689.87	3585.10	3628.03	83159996	6617482	8433346	7182384
2.1 Intra-bank @	9583.32	862.55	918.60	873.32	52142582	3970049	4985305	4126602
2.2 Inter-bank @	31143.27	2827.31	2666.49	2754.70	31017413	2647433	3448041	3055782
B. ATMs								
3 Cash Withdrawal at ATMs \$ (3.1 to 3.3)	65240.43	6032.74	5725.75	6119.16	3111946	289887	265244	291538
3.1 Using Credit Cards \$	62.37	5.64	7.24	7.67	3130	286	352	375
3.2 Using Debit Cards \$	64851.61	5998.03	5684.15	6073.01	3097739	288605	263765	289951
3.3 Using Pre-paid Cards \$	326.45	29.07	34.36	38.48	11076	997	1127	1212
4 Cash Withdrawal at PoS \$ (4.1 to 4.2)	91.17	5.34	2.71	2.15	728	64	34	22
4.1 Using Debit Cards \$	79.42	4.44	2.67	2.12	557	39	34	22
4.2 Using Pre-paid Cards \$	11.75	0.90	0.04	0.03	171	25	0	0
5 Cash Withdrawal at Micro ATMs @	11126.04	946.33	1004.99	1156.16	299776	24799	26097	30463
5.1 AePS @	11126.04	946.33	1004.99	1156.16	299776	24799	26097	30463

Source: RBI Bulletin, December (2022)

Table 7: Payment Infrastructure (in Lakhs)

System	As on March 2022	2021	2022	
		Oct.	Sep.	Oct.
	1	2	3	4
Payment System Infrastructures				
1 Number of Cards (1.1 to 1.2)	9912.93	9991.95	10162.40	10188.29
1.1 Credit Cards	736.27	663.61	777.02	793.68
1.2 Debit Cards	9176.66	9328.34	9385.38	9394.61
2 Number of PPIs @ (2.1 to 2.2)	15553.69	14450.87	15842.95	15968.37
2.1 Wallets @	12787.93	12025.10	13106.33	13195.92
2.2 Cards @	2765.76	2425.77	2736.62	2772.44
3 Number of ATMs (3.1 to 3.2)	2.52	2.41	2.55	2.55
3.1 Bank owned ATMs \$	2.20	2.13	2.20	2.20
3.2 White Label ATMs \$	0.31	0.28	0.35	0.35
4 Number of Micro ATMs @	9.16	6.71	12.39	12.90
5 Number of PoS Terminals	60.70	51.55	70.35	72.11
6 Bharat QR @	49.72	44.35	48.64	47.19
7 UPI QR *	1727.34	1285.05	2164.30	2253.23

Source: RBI Bulletin, December (2022)

Objective 2: Challenges of fintech in Indian Banking system

The evolution of fintech also brings some challenges to the banking system of world and India as well. Such challenges are concentration risk, systemic risk, market power, regulatory arbitrage, customer protection, data privacy and cyber security, which create hurdles for delivery of banking services smoothly.

Table 8 shows bank wise fraud cases in India in terms of number of fraud cases and amount involved. It is revealed from the table that fraud cases are highest in public sector banks and private sector banks in last three financial years. The picture of fraud cases has increased in last three financial years in private banks where number of cases were 32.2%, 50.4 % and 58.6%; amount involved were 18.5%, 33.5% and 29.1% in 2019-20, 2020-21 and 2021-22 respectively. On the other hand, public sector bank shows decline in number of frauds from 50.7% in 2019-20 to 33.8% in 2021-22 also amount involved from 79.9% in 2019-20 to 66.7% in 2021-22.

Table-8: Bank wise fraud cases in India (amount in crores)

Bank/Financial institutions	2019-20		2020-21		2021-22	
	Number of frauds	Amount involved	Number of frauds	Amount involved	Number of frauds	Amount involved
Public sector banks	4410 (50.7%)	148224 (79.9%)	2901 (39.4%)	81901 (59.2%)	3078 (33.8%)	40282 (66.7%)
Private banks	3065 (35.2%)	34211 (18.5%)	3710 (50.4%)	46335 (33.5%)	5334 (58.6%)	17588 (29.1%)
Foreign banks	1026 (11.8%)	972 (0.5%)	520 (7.1%)	3280 (2.4%)	494 (5.5%)	1206 (2.0%)
Financial institutions	15 (0.2%)	2048 (1.1%)	24 (0.3%)	6663 (4.9%)	10 (0.1%)	1305 (2.2%)
Payment banks	38 (0.4%)	2 (---)	88 (1.2%)	2 (---)	30 (0.3%)	1 (---)
Small finance bank	147 (1.7%)	11 (---)	114 (1.6%)	30 (---)	155 (1.7%)	30 (---)
Local area bank	2 (---)	---	---	---	---	---
Total	8703 (100%)	185468 (100%)	7359 (100%)	138211 (100%)	9103 (100%)	60414 (100%)

Source: RBI Annual Report, 2021

Further, table 9 shows fraud cases of banks in different areas of advances, off balance sheet, forex transactions, credit card, internet related, deposit, inter branch account, cash, cheque and demand deposit, clearing account etc. Most of the fraud cases are in advances category followed by credit card and internet related frauds. The figure of advance related frauds were 52.9 percent in 2019-20, 47.5 percent in 2020-21 and 42.2 percent in 2021-22. There is growth in number fraud cases related to credit card and internet in the last three years. The figure was 30.7 percent in 2019-20, 34.6 percent in 2020-21 and 39.5 percent in 2021-22. Hence, both the table 5 and table 6 reveals that most of the fraud cases take place in private banks and public sector banks and such cases are related to loans and advances, credit card and technology-enabled transactions. Banks are facing challenges due to such fintech related issues like theft of money, data leakage, extortion, cyber security risk etc.

However, the fintech companies are complying with regulatory measures provided by different regulatory bodies like RBI, IRDA, Information Technology (data protection act), BIS etc. Some of such regulatory measures are explained below-

Regulatory Guidelines for Fintech

While Fintech adoption in India has been unprecedented, it continues to face certain challenges like risk of data security and privacy leak, platform downtimes, lack of financial literacy and awareness in India, as well as differential adoption rates among MSMEs that dominate Indian economy. Further, rapidly changing regulations due to the evolving nature of the sector also poses cost-related challenges for users and businesses. For example, regulations for investment exits, cryptocurrency, payment regulations, data, infrastructure security, and consumer protection are still evolving. The broader debate on regulatory arbitrage focuses on two aspects. Firstly, banks may shift capital-intensive activities to online lending platforms leading to regulatory leakage. Secondly, online lending platforms may continue to gradually adopt services which are at the core of bank-based financial intermediation. Lending activity, whether online or otherwise, by any legitimate lender is governed by the respective applicable legislation.

Table-9: Fraud cases in area wise operation in Banks (Amount in crore) in India

Area of operation	2019-20		2020-21		2021-22	
	Number of frauds	Amount involved	Number of frauds	Amount involved	Number of frauds	Amount involved
Advances	4608 (52.9%)	181942 (98.1%)	3497 (47.5%)	136812 (99.0%)	3839 (42.2%)	58328 (96.5%)
Off balance sheet	34 (0.4%)	2445 (1.4%)	23 (0.3%)	535 (0.4%)	21 (0.2%)	1077 (1.8%)
Forex transactions	8 (0.1%)	54 (---)	4 (0.1%)	129 (---)	7 (0.1%)	7 (---)
Credit Card/Internet	2677 (30.7%)	129 (0.1%)	2545 (34.6%)	119 (0.1%)	3596 (39.5%)	155 (0.2%)
Deposit	530 (6.1%)	616 (0.3%)	504 (6.8%)	434 (0.3%)	471 (5.2%)	493 (0.8%)
Inter branch account	2 (---)	-	2 (---)	-	3 (--)	2 (---)
Cash	371 (4.3%)	63 (---)	329 (4.5%)	37 (---)	649 (7.1%)	93 (0.2%)
Cheque/Demand deposit	201 (2.3%)	39 (---)	163 (2.2%)	85 (0.1%)	201 (2.2%)	158 (0.3%)
Clearing account	22 (0.3%)	7 (--)	14 (0.2%)	4 (---)	16 (0.2%)	1 (---)
Others	250 (2.9%)	173 (0.1%)	278 (3.8%)	54 (---)	300 (3.3%)	100 (0.2%)
Total	8703 (100%)	185468 (100%)	7359 (100%)	138211 (100%)	9103 (100%)	60414 (100%)

Source: RBI Annual Report, 2021

Apart from these legitimate lenders engaged in balance sheet lending organically, there are essentially two types of entities operating in the digital lending ecosystem, which require attention:

- a. **Lending Service Providers (LSPs):** In the context of digital lending, these are essentially technology-centric entities, which act as both core and ancillary lending service providers. The services provided by LSPs include providing a marketplace for the lenders as well as the borrowers, loan sourcing, underwriting, collection services for repayments, data aggregation & analysis, rating services, etc. Within LSPs, there are two types of entities: i. Entities regulated by the financial sector regulators such as credit information companies, NBFC-Account Aggregator (NBFC-AA), NBFC-Peer to Peer Lending Platform (NBFC-P2P) regulated by RBI; and credit rating agencies regulated by SEBI. ii. Entities not specifically regulated by any financial sector regulator Technically, LSPs are not undertaking 'business of a financial institution' as defined under the RBI Act and the loans, which are sourced, appraised or serviced by them, are not their assets. Generally, LSPs are acting in partnership with a bank or an NBFC and therefore, their activities are governed by the guidelines on outsourcing of financial services issued for banks/ NBFCs by RBI. However, similar guidelines on outsourced activities by other balance sheet lenders (i.e., excluding banks/ NBFCs) are not in place thus precluding LSPs partnering with them from any specific scrutiny.

- b. **Fringe lenders:** These are shadow balance sheet lenders which operate without getting themselves registered for lending activities with the concerned authorities, thus creating an informal market. Considering the anonymity and velocity provided by technology, it is a challenging task to identify and monitor such fraudulent platforms/ applications on real time basis.
- c. **Rent-an-NBFC model by digital lenders:** A synthetic structure enabling unregulated entities to lend without complying with prudential norms is through credit risk sharing arrangements by way of a “First Loss Default Guarantee (FLDG)” extended by the LSPs. Under this, the LSP provides certain credit enhancement features such as first loss guarantee up to a pre-decided percentage of loans generated by it. From the LSP’s perspective, offering FLDG acts as a demonstration of its under-writing skills whereas from the lender’s perspective, it ensures platform’s skin in the business. For all practical purposes, credit risk is borne by the LSP without having to maintain any regulatory capital. The loan portfolio backed by FLDG is akin to off-balance sheet portfolio of the LSP wherein the nominal loans sit in the books of the lender without having to partake in any lending process. In some cases, the LSP, as a non-banking non-financial company (NBNC) may be undertaking balance sheet ending in partnership with a bank/ NBFC or on stand-alone basis, while not satisfying the principal business criteria to remain outside regulation. Besides, there are higher operational risks which arise due to increasing reliance of lenders on third-party service providers. With increasing share of digital lending in retail/ personal space, there is a potential for risk build-up because of these platforms. This may also be adding to counter party risks posed by the platform to its lending partners.
- d. **Shadow Lending:** Conduct of financial service under digital anonymity and layering under regulated entities in varied forms is also a cause of concern. Many players operating in the digital lending ecosystem are not required to be registered with a financial sector regulator. This coupled with anonymity provided by internet, country of origin, involvement of different entities in the life-cycle of a loan and lack of clear demarcation between actual balance sheet lender and LSPs raise multiple strategic concerns besides those related to money laundering.
- e. **Payments Banks (PBs):** The objective of setting up Payments Banks (PBs) with a structured licensing process was to provide small savings accounts and payments/ remittance services to migrant labor workforce, low-income households, small businesses, and other unorganized users. The PBs are eligible for conversion into a Small Finance Bank (SFB) after five years of operations. Since they are not permitted to lend, currently they act as LSP for other NBFCs/ banks.
- f. **Customer Data Protection (CDP):** Section 43A of the Information Technology Act, 2000, provides for payment of compensation by a body corporate in case of negligence in implementing reasonable security practices and procedures in handling sensitive personal data or information resulting in wrongful loss to any person. In terms of section 72A of that Act, disclosure of information, knowingly and intentionally, without the consent of the person concerned and in breach of the lawful contract has been also made punishable with imprisonment for a term extending to three years and fine. Hence, that data protection is generally governed by the contractual relationship between the parties, and the parties are free to enter into contracts to determine their relationship defining the terms personal data, personal sensitive data, its dissemination, etc. As such, it may be necessary to emphasize the need for an exhaustive stand-alone legislation on data

protection in India keeping in mind the innovations in FinTech and risk to personal data which comes to the possession of these entrepreneurs.

- g. Classification of Customer / Organization Data (CCOD):** The FinTech entities should classify data / information based on information classification / sensitivity criteria of the organization. It becomes important to appropriately manage and provide protection within and outside organization borders/network taking into consideration how the data/information are stored, transmitted, processed, accessed and put to use within/outside the bank's network, and level of risk they are exposed to depending on the sensitivity of the data/information.
- h. Adherence to Safe Transaction Principles (STP):** A transaction in the IT parlance is termed as successful, if the transaction does not suffer from loss of confidentiality, loss of integrity, and loss of availability. These three together are referred as the security triad / the CIA triad. The three consequences of lack of CIA leads to "Data Leakage to Unauthorized Parties", "Data Tampering / Destruction by an Unauthorized Party", "Non Availability of the Data / System at times it is really needed". The FinTech entities need to satisfy these principles in order to build faith in the new ecosystem.
- i. Network Management and Security (NMS):** The FinTech entities should establish a common / individual Security Operation Centre (SOC) to monitor the adherence to Standard Operating Procedures (SOP) of the all major IT activities. A Security Incident and Event Management Systems (SIEM) is of great help to monitor these, which the entities may induct as part of their monitoring services

Conclusion

Fintech is an evolving concept and many more is yet to evolve that will transform the traditional banking concept. The disruptions made by fintech in financial sector brings paradigm shift in banking sector. The concepts like neo bank, digital banking, digital lending, paperless transactions, cashless transactions, peer to peer lending, digital currency, tokenization of money etc. are evolving due to use of technology in financial and banking segment as well. The traditional banking is shifting towards digital banking due to the blessing of fintech. Such Fintech brings both opportunity and challenges to the stakeholders of banking system. It enables banks to improve delivery of banking services, increase in customer base, customize banking products, easy access to banking services by all segments of customers, place and time utility to customers etc. Additionally, some challenges and risks are also associated with fintech that brings threats to privacy customer, misuse of customer data, cyber-attack, money laundering, fraud in digital lending, loss of money due to phishing activity, lack of digital education, frequent change and upgradation of technology leading to increase in operating cost of banks and financial institutions etc. However, continuous effort is made by government and other regulatory authorities like RBI, SEBI, IRDA etc. to address such fintech related risks and challenges. In banking sector, Reserve Bank of India as an apex institution undertakes policies and measures to regulate the activities related to digital transactions of financial institutions, banks, NBFCs, payment banks etc. Licensing, requirement of paid-up capital, registration with RBI, disclosure of accounts, compulsory auditing of accounts, compliance with RBI guidelines is some of such initiatives of Reserve bank of India to minimize the fintech induced risks by regulating the digital activities of banks and other financial institutions.

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