EduTap

SUMMARY SHEET

FinTech

EduTap

EduTap Hall of Fame

RBI Grade B 2020 - 21 — 198 Selections Out of 257


Mr. Ajil


Mr. Aman Choudhary


Mr. Arun Sharma


Ms. Ila Sahu


Mr. Nishant Yadav


Ms. Ojaswi Dale


Mr. Parimal S Athaley


Ms. Resmarani Sahoo


Mr. Ryan Varghese


Mr. Shubham


Mr. Somya Atre


Ms. Srishtil Dabas


Ms. Twinkle Dahiya


Mr. Vaibhav Nayer

SEBI Grade A 2020 — 63 Selections Out of 80


Mr. Gaurav


Mr. Abhishek


Mr. Abhishek


Mr. Adesh


Mr. Adil


Miss. Gopika


Mr. Harsh


Miss. Akansha


Mr. Amit Meena


Mr. Dhruv


Mr. Digant


Mr. Durga Parsad


Mr. Hitesh


Mr. Johnson

NABARD Grade A 2020 — 65 Selections Out of 69


Mr. Gourav Kumar


Mr. Sayed Saif


Mr. Vinay Jadhav

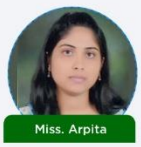

Mr. Ratan Singh


Mr. Vishal Singla


Mr. Mohan Das


Miss. Garima


Mr. Amandeep


Miss. Arpita


Mr. Krishan Kumar


Mr. Shivam


Mr. Karan Sharma

Miss. Shivani Bhosle

Mr. Prasad

1 Introduction

Financial technology (Fintech) is used to describe new technology that seeks to **improve and automate** the delivery and use of financial services.

1.1 Definition of Fintech

Fintech, the word, is a combination of **"financial technology"**. Broadly, the term "financial technology" can apply to any innovation in how people transact business, from the invention of digital money to double-entry bookkeeping. However, there is **no universally agreed** upon definition for fintech. For simple understanding, it is generally described as:

- Fintech now describes a variety of financial activities, such as **money transfers**, depositing a check with your smartphone, bypassing a bank branch to apply for credit, raising money for a business start-up, or **managing your investments**, generally without the assistance of a person.

What is a Fintech Company?
Fintech companies integrate technologies (like AI, blockchain and data science) into traditional financial sectors to make them safer, faster and more efficient.

Example of Fintech Company In India: **Paytm, Policy Bazaar etc**.

1.2 FinTech History and Evolution

Some of the landmark developments in the fintech domain are:

1. Credit card appeared in 1950s
2. Beginning of the use of Automated Teller Machines (ATM) in the 1960s
3. Electronic Stock Trading and Banks' new data recording systems in 1970s and 80s
4. E – Commerce and Online brokering in 1990s
   - The online revolution in the last decade of the 20th century connected the world through the Internet, and enabled e-commerce, Internet banking and pioneering online payment platforms.
5. With the onset of Smartphone as a powerful tool the movement to **app-based operating systems** spurred innovation, unbundling and sharing of services.
6. **Bitcoin** (Digital Currency) came as another important development in 2009.

However the turning point for fintech in its modern form was the **Global Financial Crisis of 2008**, as after the crisis FinTech entrepreneurs realised that banking services should be transparent, facilitative and economical.

1.3 Key Enabling Technologies used by Fintechs

Advances in technology allow for innovation in the ways businesses and individuals perform financial activities. The underlying, cross-cutting technologies that enable much of fintech includes:

1. Artificial Intelligence

Artificial intelligence is an emerging technology that **facilitates intelligence and human capabilities of sense, comprehend and act** with the use of machines.

- It includes technologies like **machine learning**, **deep learning, pattern recognition**, **big data**, **neural networks**, **self-algorithms** etc.

Examples of Use of Artificial Intelligence:

1. **Credit Card Fraud Detection System**: AI can help to detect abnormal payment patterns in credit card fraud detection systems.
2. **Using face ID for unlocking our Financial Apps** is now part of our daily lives. It uses face recognition through which a specific face is recognised.

2. Big Data

The term Big Data has been in use since the late 1990s and refers to the vast amount of data being generated by industry, governments, individuals, and electronic devices.

- Big Data includes data generated from **traditional sources**—such as stock exchanges, companies, and governments—as well as **non-traditional** data types, also known as alternative data, arising from the use of electronic devices, social media, sensor networks, and company exhaust.

Characteristics of BIG DATA:

The term Big Data typically refers to datasets having the following characteristics:

- **Volume**
- **Velocity**: The speed with which the data are communicated is extremely great.
- **Variety**: The data are collected from many different sources and in a variety of formats

Examples of Use of Big Data:

Some of the areas of use of big data are

1. Personalized Services as per their behavioural Pattern
2. Compliance with Regulations
3. Fighting with Frauds

3. Application Programming Interface (API)

An **API** is a set of programming code that **enables data transmission between one software product and another**. APIs comprise a set of rules and specifications that software programmes use to communicate with each other.

Example: When you pay money through PayTM from you bank account, lot of communication takes places between Paytm and your Bank account such as given below. All this happens through **APIs**

1. Sending user details to the Bank
2. Verifying the password with the bank
3. Sending the amount to be debited from the bank account
4. Confirming to the bank that amount has been transferred and hence transaction is complete

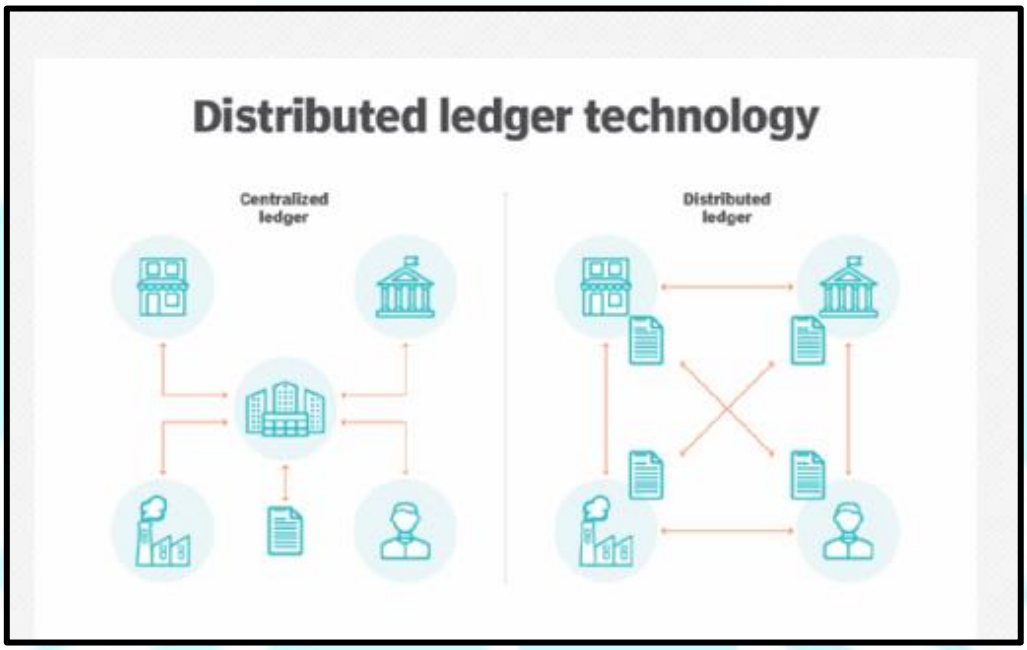
4. Biometrics

Biometrics is the measurement and **statistical analysis** of people's unique physical and behavioural characteristics. The technology is mainly used for identification and access control or for identifying individuals.

- There's long been an **inverse relationship between security and convenience**, when it comes to granting consumers access to their personal accounts, from social media to financial.

- Over the years, physical signatures have been replaced by modern biometrics and have further evolved due to the advent of Artificial Intelligence (AI).

5. Distributed Ledger Technology (DLT)



Distributed ledger technology (DLT) is a digital system for **recording the transaction of assets** in which the transactions and their details are recorded in multiple places at the same time. Blockchain is one of the most popular example of DLT.

- Unlike traditional databases, distributed ledgers have no central data store or administration functionality. The set of information is stored across various systems. **For example**, the name of the customer might be in one system whereas his password might be located in another system at a different location
- Distributed-ledger technology (DLT) enables safer, faster and cheaper transactions in an ever-increasing number of sectors.
- DLT's is being increasingly used in storing digital currencies.
- The most important potential advantages of DLT are listed below:
  1. **Decentralization** and **Disintermediation**: DLT enables direct transfers of digital value or tokens between two counterparties and decentralized record-keeping, removing the need for an intermediary or central authority who controls the ledger.
     - This can translate into lower costs, better scalability and faster time to market.

  2. **Reduced Cyber Crime**: Since data is stored in a decentralized manner, it would be difficult for the attacker to engage in any phishing attacks by targeting one system. Multiple systems would have to be targeted which makes the attacks more difficult

1.4 What are the advantages of FinTech?

The following are some of the major advantages of fintech or financial technology for our economic sectors.

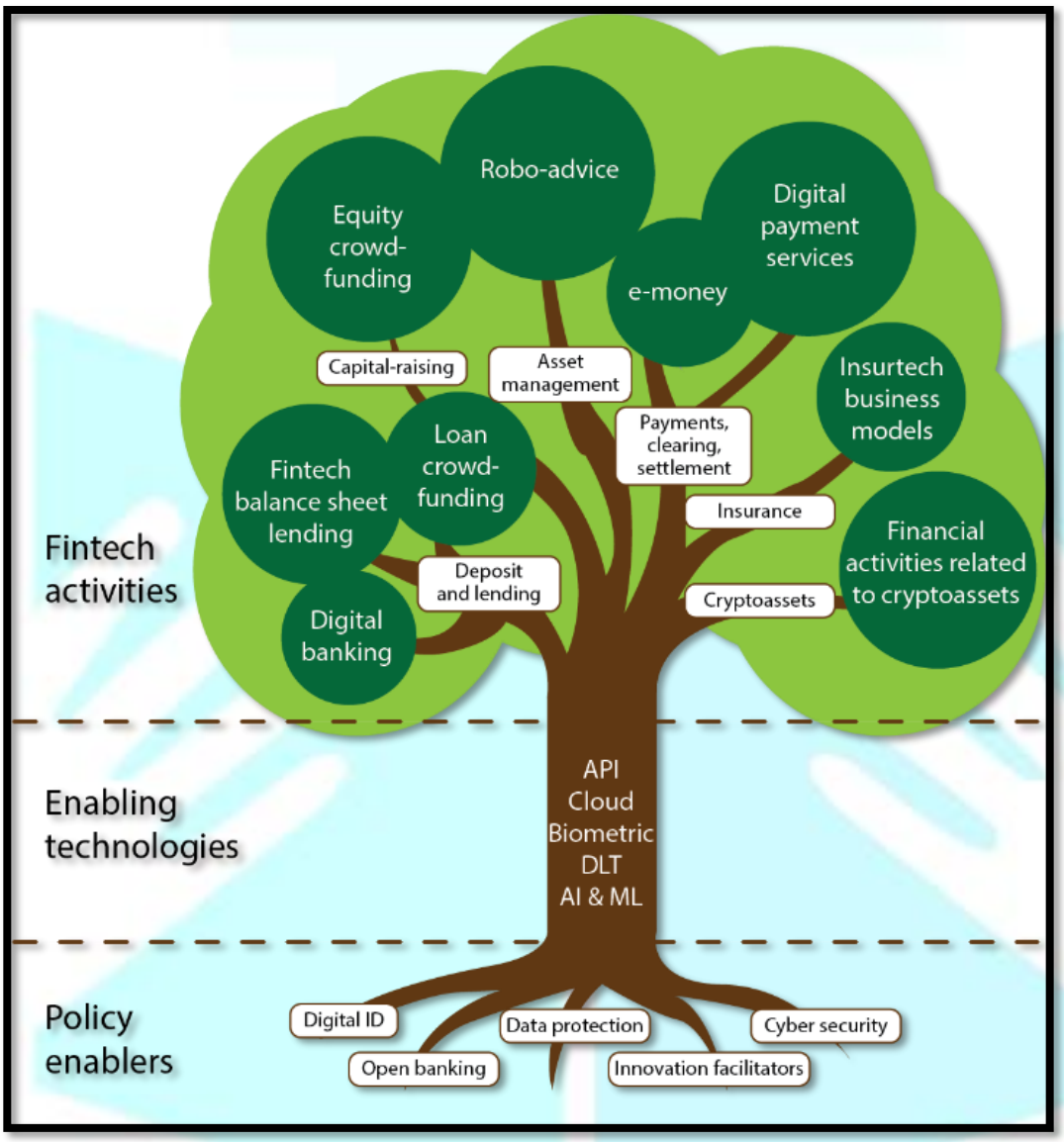
a. **Efficiency enhancement:** Through optimizing efficiency and boosting productivity, Fintech **enhances the quality** of traditional financial institutions resulting in **reduced costs**.
b. **Speed of approval**: Fintech has the ability to increase the accessibility and speed up the 'approval for finance' rate.
c. **Financial Inclusion**: Fintech allows companies to **use innovative technology** to broaden their reach and areas of service. Through mobile apps and Internet Kiosks, banks are able to serve people in remotes part of the country
d. **Reduced credit Risks**: By providing more choice of credit sources, proliferation of FinTechs could lower the risks an economy faces if credit provisioning is dominated by a few banks.
e. **More Profit for Companies**: By providing better and modern services, the **customer retention rates** of companies is increasing resulting in more profits.
f. **Improved Security**: **Biometric data, tokenization, and data encryption** are some of the latest security solutions used by businesses in this field.
g. **Single Platform for Unified Services**: One of the advantages of fintech companies is that they offer a **single platform of payments**.
h. **Valuable Advice**: To guide individuals on their finances, many of the latest systems are dependent on robot-advice.
i. **Regtech**: Regtech (regulatory technology) focuses on the **automation of compliance processes for financial institutions**. Further, it offers fast and cost-effective management of large amounts of data, including transaction records and compliance documents, such as corporate tax returns.
j. **Insuretech**: The term insuretech refers to the application of technology to the insurance model, which allows companies to **provide tailored insurance services and data security**. Further, insuretech helps streamline the insurance process through online claims filing and policy management.

Besides all the above-mentioned benefits of financial technology, it helps drive change in traditional financial services and **foster innovation** by creating new products or services that can bring benefits to customers and small businesses or start-ups.

1.5 Difference between Fintech and Traditional banking Sector

Fintech Companies	Traditional Banking Industry
They majorly focus on **managing customer experiences.**	Additionally, they majorly focus on the **management of risk.**
They incline towards mobile functionality, data analysis, ease of accessibility, cloud computing, and personalisation.	Further, they incline towards supply credit, economic growth, trust, security, and capitalisation.
Area of premises is **solely based on customer satisfaction** and good user experience.	They strive towards integrating good patterns to make sure customers have a seamless transaction.
They main to **provide 24*7 services to all areas** of the world including remote areas where banks fail to provide services.	Banks have been trying to ease the financial transactions for customers in remote areas but have somehow been less successful in attaining it.
They have higher penetrations due to mobile connectivity.	The physical distribution of banks is a major issue to resolve.
They are consumer oriented.	Further, they are process oriented.
They heavily depend on the technology.	Moreover, they are very traditional in their approach.

1.6 Areas of Fintech



1.6.1 Banking

The major target niche areas for Fintechs in this sector are from the consumer lending and commercial lending to payment space.

- **Mobile banking** is a large part of the fintech industry. In the world of personal finance, consumers have increasingly demanded **easy digital access** to their bank accounts, especially on a mobile device.
  - Most major banks now offer some kind of mobile banking feature, especially with the rise of neobanks.
- Some banks go above and beyond, **offering virtual assistants** to make the mobile experience even simpler.
  - From text- and voice-enabled payments to fraudulent alerts and credit score notifications, virtual assistants are already enhancing the relatively new world of mobile banking.
  - Some of the examples are Eno, Ally assist, ERICA etc.

Neobanks

Neobanks are essentially **banks without any physical branch locations**, serving customers with checking, savings, payment services and loans on a completely mobile and digital infrastructure. Some examples of neobanks are **Chime, Simple and Varo**.

1.6.2 Investment and Savings – Asset Management

Fintech has caused an explosion in the number of investing and savings apps in recent years.

- A new trend after the Covid – 19 pandemic has been **rising interest in savings and investing applications**, the type of service fintech start-ups offer consumers.
- Now, there are a slew of fintech start-ups in the micro saving department also.
- Investment advisory services are undergoing changes with the growth of automated wealth advisers or **"Robo-advisers".**
  - Robo-advisers may assist investors **without the intervention of a human adviser**, or they may be used in combination with a human adviser.
  - The desired outcome is the ability to **provide tailored, actionable advice** to investors with greater ease of access and at lower cost.
- Areas of fintech development that are more directly relevant to the investment industry include the following:
  1. **Analysis of large datasets**
  2. **Analytical tools**
  3. **Automated Trading**

Drivers underlying fintech development in these areas include extremely **rapid growth in data—including their quantity, types, sources, and quality**—and technological advances that enable the capture and extraction of information from them.

1.6.3 Blockchain and Cryptocurrency

Blockchain Technology

A Blockchain is a **digitized, decentralized, public ledger**. It is an **incorruptible digital ledger of transactions** that can be programmed to **record virtually everything of value.**

- **Each list of record** in a blockchain is called block. So a blockchain is a **continuously growing list of records** called blocks, which are **linked and secured**.
- Blockchain Technology was invented by **Satoshi Nakamoto in 2008** for use in the **cryptocurrency bitcoin**, as its public transaction ledger.
- Blockchain technology **discards the need of any third-party or Central authority** for peer-to-peer transactions.

Cryptocurrency

A cryptocurrency is a **tradable digital asset** or digital form of money, built on blockchain technology that **only exists online**. Cryptocurrencies use **cryptography** to verify and secure transactions.

- Cryptocurrencies such as Bitcoin use codes to encrypt transactions and stack them up in blocks, creating Blockchains. It is the use of codes that differentiates cryptocurrencies from other virtual currencies.
- These digital currencies are **not issued or regulated** by a central authority.
- The commonly used cryptocurrencies are **Bitcoin, Gridcoin, Litecoin, Ripple, Next, Dash** etc.
- Facebook has announced a **digital currency called Libra** that will roll out for use in 2020 and allow the platform's billions of users across the globe to make financial transactions online.

Cryptocurrencies and India:

- The **Reserve Bank of India (RBI) had barred banks and financial institutions** from dealing with cryptocurrencies.

- **Inter-Ministerial Committee on Virtual Currencies (2019)** headed by finance secretary **Subhash Chandra** Garg has submitted its report to the government recommending ban on all forms of Cryptocurrencies.
- It noted that the **RBI Act of 1934** has the enabling provisions to permit the Central government to approve a **"Central Bank Digital Currency"** (CBDC) as legal tender in India.

Why the Indian Government has conservation regarding cryptocurrencies?

- **Sovereign guarantee:** Cryptocurrencies pose risks to consumers. They do not have any sovereign guarantee and hence are not legal tender.
- **Market volatility:** Their speculative nature also makes them highly volatile. For instance, the value of Bitcoin fell from USD 20,000 in December 2017 to USD 3,800 in November 2018.
- **Risk in security:** A user loses access to their cryptocurrency if they lose their private key (unlike traditional digital banking accounts, this password cannot be reset).
- **Malware threats:** In some cases, these private keys are stored by technical service providers (cryptocurrency exchanges or wallets), which are prone to malware or hacking.
- **Money laundering:** Cryptocurrencies are more vulnerable to criminal activity and money laundering. They provide greater anonymity than other payment methods since the public keys engaging in a transaction cannot be directly linked to an individual.
- **Regulatory bypass:** A central bank cannot regulate the supply of cryptocurrencies in the economy. This could pose a risk to the financial stability of the country if their use becomes widespread.
- **Power consumption:** Since validating transactions is energy-intensive, it may have adverse consequences for the country's energy security (the total electricity use of bitcoin mining, in 2018, was equivalent to that of mid-sized economies such as Switzerland).

The Supreme Court recently lifted the ban imposed by the Reserve Bank of India (RBI) on virtual currency trading, including cryptocurrencies.

1.6.4 What is Central Bank Digital Currency (CBDC) or Digital Rupee (e₹)

Reserve Bank broadly defines CBDC as the legal tender issued by a central bank in a digital form. It is akin to sovereign paper currency but takes a different form, exchangeable at par with the existing currency and shall be accepted as a medium of payment, legal tender and a safe store of value. CBDCs would appear as liability on a central bank's balance sheet.

Key Motivation or reasons to launch CBDC

1. **CBDC, being a sovereign currency**, holds unique advantages of central bank money viz. trust, safety, liquidity, settlement finality and integrity. The key motivations for exploring the issuance of CBDC in India among **others include reduction in operational costs involved in physical cash management, fostering financial inclusion, bringing resilience, efficiency, and innovation in payments system, adding efficiency to the settlement system, boosting innovation in cross-border payments space and providing public with uses that any private virtual currencies can provide, without the associated risks.**

2. **The use of offline feature in CBDC would also be beneficial in remote locations** and offer availability and resilience benefits when electrical power or mobile network is not available

3. Moreover, it is the responsibility of central bank to provide its citizens with a risk-free central bank digital money which will provide the users the same experience of dealing in currency in digital form, without any risks associated with private cryptocurrencies**. Therefore, CBDCs will provide the public with benefits of virtual currencies while ensuring consumer protection by avoiding the damaging social and economic consequences of private virtual currencies**

Types of CBDCs - CBDC can be classified into two broad types viz. **general purpose or retail (CBDC-R) and wholesale (CBDC-W).**

- **Retail CBDC** would be potentially available for use by all viz. private sector, non-financial consumers and businesses. **Wholesale CBDC** is intended for the settlement of interbank transfers and related wholesale transactions. It would be available for select financial Institution

Models of CBDC - There are two models for issuance and management of CBDCs viz. Direct model (Single Tier model) and Indirect model (Two-Tier model).

- **Direct Model:** A Direct model would be the one where the central bank is responsible for managing all aspects of the CBDC system viz. issuance, account-keeping and transaction verification. **Whereas as in Indirect Model**, central bank and other intermediaries (banks and any other service providers), each play their respective role.

1.6.5 Digital Lending

Fintech is also overhauling credit by **streamlining risk assessment, speeding up approval processes and making access easier**.

- Billions of people around the world can now apply for a loan on their mobile devices, and new data points and better risk modelling is expanding credit to underserved populations.
- Additionally, consumers can **request credit reports multiple times** a year without dinging their score, making the entire backend of the lending world more transparent for everyone.

RBI rules and regulation on Digital Lending

The Reserve Bank of India **had constituted a Working Group (WG) on digital lending including lending through online platforms and mobile apps on January 13, 2021, with Shri Jayant Kumar Dash. The working group submitted its recommendations to the RBI in the month of November 2021.**

Taking into account the inputs received from diverse set of stakeholders, a regulatory framework to support orderly growth of credit delivery through digital lending methods while mitigating the regulatory concerns, has been firmed up. **This regulatory framework** is based on the principle that **lending business can be carried out only by entities that are either regulated by the Reserve Bank or entities permitted to do so under any other law.**

The universe of digital lenders is classified into three groups –

A. Entities regulated by the RBI and permitted to carry out lending business;
B. Entities authorized to carry out lending as per other statutory/regulatory provisions but not regulated by RBI;

C. Entities lending outside the purview of any statutory/ regulatory provisions.

Lending rules for Entities regulated by the RBI.

- Disburse-ments and repayments of loans should **be executed between bank account of borrower and regulated entity**
- **Cost of digital loans in Annual Percentage Rate (APR)** needs to be disclosed to borrower
- A **standardized Key Fact Statement (KFS)** must be provided to the borrower before executing the loan contract.
- A cooling-off/ look-up period during which the borrowers **can exit digital loans by paying the principal and the proportionate APR** without any penalty shall be provided as part of the loan contract.

1.6.6 Insurance

While **insurtech** is quickly becoming its own industry, it still falls under the umbrella of fintech.

- Insurance is a somewhat slow adopter of technology, and many fintech start-ups are partnering with traditional insurance companies to help **automate processes and expand coverage**.
- From mobile car insurance to wearables for health insurance, the industry is staring down tons of innovation.

1.6.7 Trading

- In the past, trading, whether it was stocks or Forex, was an **activity reserved to the experts**.
- FinTech changed all of this. Now, everyone can trade online by **opening accounts on dedicated platforms**.
  - Forex, in particular, became very **democratized**.
  - Today, due to FinTech, traders have **robo-advisors**
  - FinTech has also started to play a poignant role in risk management in trading.

1.6.8 Equity Crowdfunding

The money for social causes can be crowd-funded from throughout the word using Fintech. **For example**, AAP crowdsourced money from across the world to fund elections in Delhi.

1.6.9 Payment, Clearing and Settlement Systems

The payments made through Paytm, Google pay, UPI all work as part of FinTech

The clearing and Settlement system on stock exchanges and in banks which is used to settle transactions in various accounts is also part of FinTech

1.6.10 Payment Aggregators and Payment Gateways:

Payment aggregators are the entities which facilitate online sale and purchase transactions primarily on e-commerce platforms, without requiring e-commerce merchants to create a separate payment integration system. Payment aggregators receive payment from customers and transfer them to the merchants after a period. On the other hand, payment gateways are the entities that provide technology infrastructure to route/facilitate processing of online payment transactions, without handling any funds

Example of Payment Gateways would be Instamojo, Razorpay, PayuMoney etc.

1.6.11 PPIs

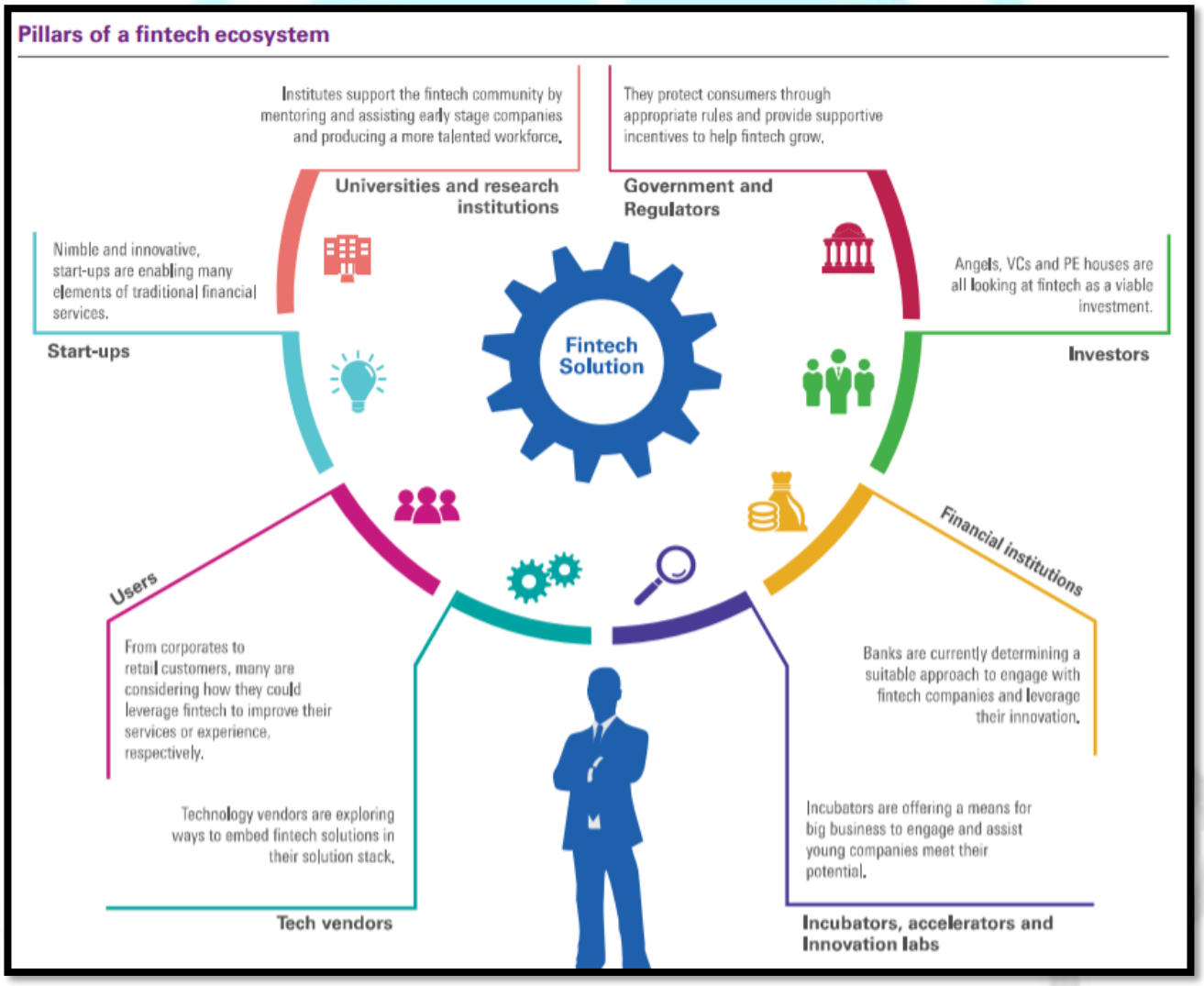
PPIs are prepaid instruments which are charged by paying some certain amount and post that they can be used to do some transactions. You must have heard about Paytm and Mobiwiki. They are nothing else but prepaid instruments. Here you can recharge your PayTM account from your bank account. Later it can be used to pay money at merchant shops or taxi rides like Uber. These instruments are called prepaid because you prepay the amount while charging your account and later you can use the same amount to do transactions. **PayTM is one such example**

1.7 Geographical distribution of Fintech

A unique feature of FinTech has been its shifting geography; both in terms of the **locus of activities** and the **area of influence**.

- According to **KPMG's FinTech100**, the new productive ground for FinTech companies is shifting from North America and Europe to the Asia-Pacific; 42 companies from the Asia-Pacific region (highest among all regions) were featured in 2019 as compared to 31 companies in 2017.
- Within the Asia-Pacific, China is facing stiff competition from countries like **India, Vietnam and Korea**. With a total of 8 companies on the FinTech100, India is emerging as a prominent FinTech force.

1.8 Pillars of FinTech



1.9 Attributes of a Successful Fintech Hub

The availability of right technical skills, significant growth in capital investments, emergence of government policies, and an entrepreneurial and innovative mind-set are the driving forces to establish fintech as an enabler.

1.10 Fintech During COVID – 19 Crisis

Positive Side

1. The world faced COVID-19 pandemic, with impacts on health services and economy. However, fintech market has continued to **help expand access to financial services** during the COVID-19 pandemic—particularly in emerging markets—with strong growth in all types of digital financial services except lending, according to a **joint study** by the World Bank, the Cambridge Centre for Alternative Finance at the University of Cambridge's Judge Business School, and World Economic Forum.
2. Despite this challenging backdrop, FinTechs have proven **resilient and adaptable**: contributing to pandemic relief efforts, adjusting operations and **offerings to serve vulnerable market segments**, like micro, small and medium-sized businesses, while posting year-over-year growth across most regions.
3. Covid-19 is **accelerating change** in how people interact with financial services, which has led to unprecedented demand from developing countries to progress their transition to secure and inclusive digital finance.

Negative Side

However, Fintech firms also reported **some operational and funding challenges** during the pandemic.

- Two-thirds of firms said they had changed their business model in response, including by reducing fees, changing qualification criteria, and easing payment requirements.
- About 60 percent reported **launching new products and value-added services**, such as offering information.
- Forty percent of firms surveyed indicated that they have **either introduced or are in the process of introducing enhanced fraud or security measures** as a response to business conditions under the pandemic.
- Further, fintech firms reported increases in expenses for onboarding and data storage.

At the same time, financial regulators see rising risks in the FinTech market considering COVID-19, particularly concerning **cybersecurity and operational risks**, as well as consumer protection issues such as fraud and scam

Conclusion

Overall Financial technology (fintech) playing a critical role in **reducing coronavirus risks associated with exchanging cash**, helping micro, small and medium enterprises (MSMEs) and supporting financial inclusion in developing markets during the pandemic and beyond.

1.11 Issues related to FinTech Industry

1. **Cybersecurity**: As more systems run by different entities become connected, more cyber vulnerabilities are likely to arise.
2. **Data Privacy and Rising Frauds and Scams**: In addition to cybersecurity, the integration of new technology with traditional systems will raise concerns regarding data collection and data privacy.
3. **Regulatory Challenges**: Regulators are experimenting with tools to oversee this new industry to ensure customer protection and cybersecurity without stifling innovation.
4. **Liability Concerns including Consumer protection regulation, privacy, and fair lending**: Since a FinTech company may not be directly regulated by banking agencies, there are emerging concerns that applicable consumer protection laws may not be scrutinized as closely in transactions where consumers are interacting with FinTech companies.

The dangers posed by fintech to consumers can be broadly categorized around **loss of privacy**; **compromised data security**; **rising risks of fraud and scams**; **unfair and discriminatory uses** of data and data analytics; uses of data that are non-transparent to both consumers and regulators; harmful manipulation of consumer behaviour; and risks that tech firms entering the financial or financial regulatory space will lack adequate knowledge, operational effectiveness, and stability.

1.12 Fintech Regulation

Fintechs can be viewed as **double edged** swords. Despite various benefits, these innovations can sometimes magnify existing threats to consumers such as likelihood of privacy breaches and cybersecurity risks, leaving behind digitally illiterate and unconnected consumers.

- Financial regulators are facing unprecedented challenges with the emergence of FinTechs.
- These firms come in new shapes and forms, so fitting them into buckets for prudential or risk-based supervision is not easy.

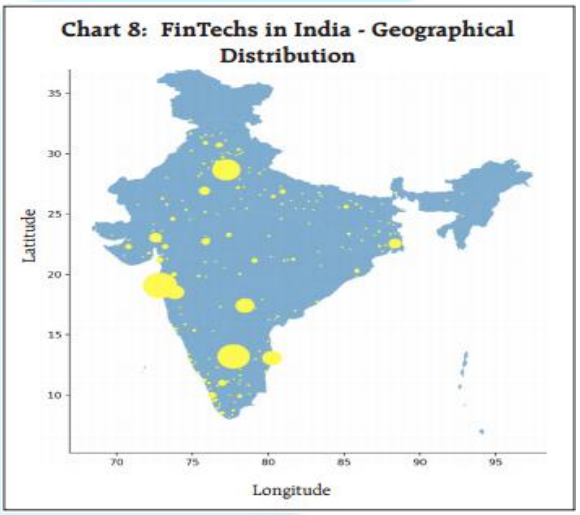
- As the scope of activities widens from national to global, regulation too has to reach out across borders.

2 India and Fintech

The Indian FinTech industry as it stands today is the result of a **unique concoction of technological enablers, regulatory interventions and business opportunities** as well as certain other characteristics unique to India.

2.1 Geographical Distribution of Indian Fintech

The hallmark of India's FinTech ecosystem is **diversity of markets and applications**. It is seen that emerging industries often concentrate regionally to benefit from agglomeration effects, but FinTech does not follow this trend.



- 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 start-up headquarters. Other cities like Jaipur, Pune, and Ahmedabad are also emerging as centres of FinTechs.
- According to the **Tracxn database**, there are a total of 4,680 companies in India classified as FinTechs, which can be grouped broadly into fifteen business models.

2.2 Major enablers of Indian Fintech

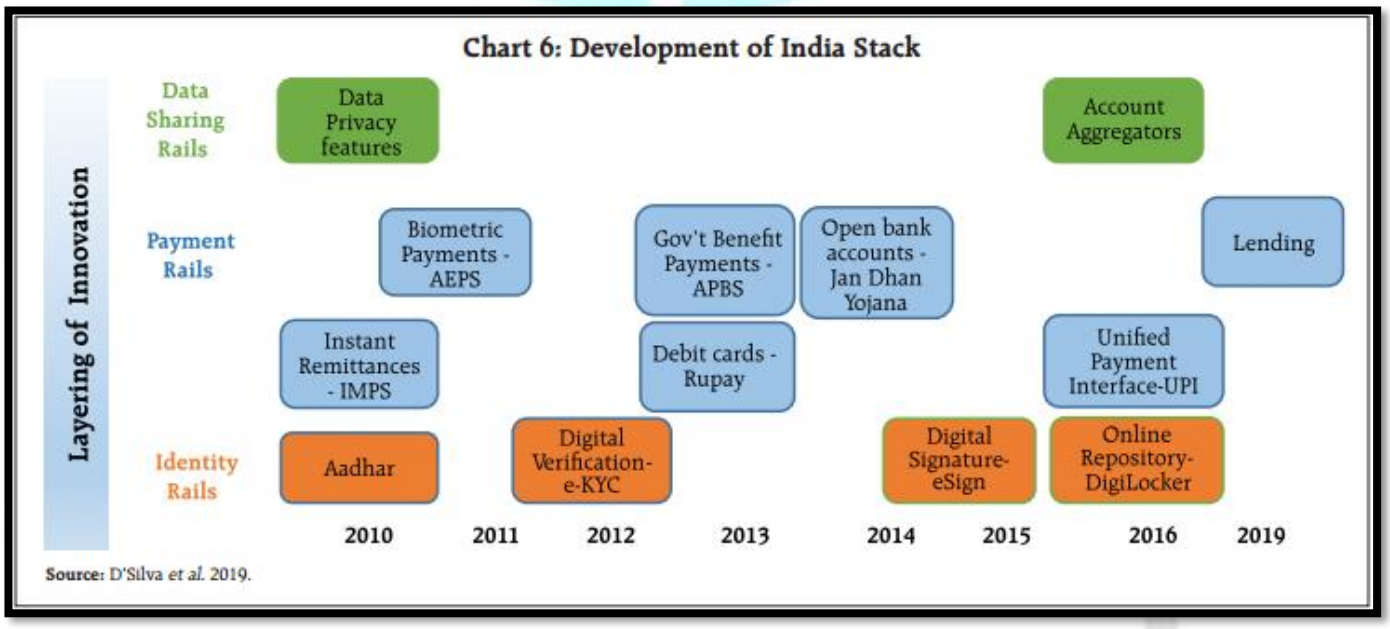
A **NASSCOM report** says that the fintech programming and administration advertising in India was around $8 billion in 2016; it expects to develop 1.7 times by the end of 2020. Additionally, the Indian Fintech programming business sector is expected to touch $2.4 billion by the end of 2020 from the current $1.2 billion in FY 2019. Some of the major enablers of Indian Fintech are:

Examples of large Fintech fundings in India

Players	Business category
Paytm	M-Wallet/Gateway
Billdesk	Payment Aggregator
Freecharge	M-Wallet/Gateway
Mobikwik	M-Wallet
A leading Indian fintech portal	Marketplace for loans and insurance products
Policybazaar	Insurance
Financial Software and Systems Pvt. Ltd.	Financial Planning

1. **Penetration of Internet and Smart phones:** Propelled by massive strides in internet and smartphone penetration, FinTechs have expanded their reach rapidly in India.
2. **Favourable Demography**: 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.
   - India and China lead the **Global FinTech Adoption Index 2019** with an adoption rate of 87 per cent. While per capita internet usage has increased, tariffs have declined.

3. **India Stack**: 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.
   - 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.



4. **Data Sharing Framework:** Wider access to data generated by online activity could be beneficial since they are often **obtained at zero marginal cost and are non-rival**.
   - In 2016, the Reserve Bank established a legal framework for a class of regulated data fiduciary entities, called **Account Aggregators** (NBFC-AA), enabling customer data to be shared within the regulated financial system with the customer's knowledge and consent.
   - Access to data will be granted to regulated entities (under the RBI, SEBI, IRDA and PFRDA) for a limited time for a specific purpose.
5. **Funding and Infrastructure Support**: The Government is naturally the prima facie catalyst for the success of fintech in a heavily regulated financial industry.
   - The Government of India along with regulators such as SEBI and RBI are aggressively supporting the ambition of the Indian economy to become a cashless digital economy and emerge as a strong fintech ecosystem via both funding and promotional initiatives.
   - The Start-Up India initiative launched by the Government of India in January 2016 includes USD 1.5 billion fund for start-ups including fintech.
   - The **Digital India and Smart Cities initiatives** have been launched to promote digital infrastructure development in the country as well as attract foreign investments.
6. **Rising Investors**: Fintech investment in India increased mani-fold from USD247 million in 2014 to more than USD 1.5 billion in 2015. India has a far lesser number of angel investors (about 1,800 angel investors in 2016) as compared to 3, 00,000 in the U.S. However, India is witnessing increasing interest levels in start-up funding, which is evident by increasing number of angel deals from 370 in 2014 to 691 in 2015.
   - Investors are coming to terms that fintech is more than just payments technology and investor interest is beginning to manifest itself in a variety of sub-segments such as investing, lending, wealth management, credit reporting among others.

2.3 Regulation of Fintech

2.3.1 Why Fintech Regulation is Necessary?

1. Since fintech is growing, potential threats like frauds, breaches, and danger to cybersecurity are also on the rise.
2. New products and services might be sold to customers who do not realize the risks
3. Illiterate people who use Fintech need consumer protection from scams
4. Fair Lending ecosystem needs to be there where everyone is treated with equity

2.3.2 Regulatory Environment in India

First, it would be interesting to know that in India there is no single regulator for Fintech. Depending on the product or service offered by the entity, the regulatory body governing such vertical would regulate those specific entities.

By and large fintech products and services can be considered to fall under the purview of the following regulators:

- the RBI.
- the Securities Exchange Board of India (SEBI).
- the Ministry of Electronics and Information Technology (MEITY).
- the Ministry of Corporate Affairs; and
- the Insurance Regulatory and Development Authority of India (IRDAI).

However, the **RBI currently regulates the majority of fintech companies** dealing with account aggregation, peer-to-peer (P2P) lending, cryptocurrencies, payments, etc.

Some of the laws governing Fintech in India are:

1. **Payments Regulated through Payment and Settlement Systems Act (2007)**: This law is the principal legislation, governing the payments regulation in India. This act prohibits the initiation and operation of any 'payment system' in India, without prior authorization of RBI.
2. **P2P lending Regulated through Guidelines regulating P2P Lending Platforms**: Peer-to-Peer Lending Platform Directions of 2017 prescribe the lender exposure norms and borrowing limits concerning the operations of P2P lending platforms in India. The detailed regulations are discussed separately in other chapters of the course
3. **Master Direction on issuance and Operation of PPIs:** Separate Guidelines have been issued by RBI for Regulation of PPIs. The detailed regulations are discussed separately in other chapters of the course
4. **NPCI Guidelines regarding UPI Payments**: UPI Payments in India are governed by UPI procedural guidelines issued by NPCI. Under current framework, only banks are allowed to directly integrate with UPI platform to provide money transfer services to their customers
5. **Guidelines Governing Payment Aggregators/Gateways**: RBI issued a circular on Guidelines on Regulation of Payment Aggregators and Payment gateways by the name "**Payment Intermediary Guidelines**'. This sets out legal framework applicable to payment intermediaries operating in India. The regulations are discussed in detail in other chapters of the course
6. **Data Privacy and Protection**: With FinTech's accessing more and more data, it becomes very important that data is protected. Information Technology Act, 2000 (IT Act) takes a lead in the same
7. **Fintech Companies Regulated through NBFC Regulations**: The Reserve Bank of India Act of 1934 governs all NBFCs. Any organization providing fintech services can provide banking related activities in India only if it is registered by the RBI as NBFC. The detailed regulations are discussed separately in other chapters of the course

Another important aspect when we discuss about Regulations related to FinTech is the regulatory Sandboxes which are discussed in the next section

2.4 Regulatory Sandboxes (RS) – Innovative Approach to Regulation

Regulatory sandbox refers to **live testing of new products or services in a controlled/test regulatory environment** for which regulators may permit certain relaxations for the limited purpose of the testing. The RS allows the regulator, innovators, financial service providers and customers to conduct field tests to collect evidence on the benefits and risks of new products and systems. The RS is an important tool which enables more dynamic, evidence-based regulatory environments which learn from, and evolve with, emerging technologies.

Various Regulatory Sandboxes have emerged over the past some years by various regulatory bodies such as RBI and SEBI and IRDAI

2.4.1 Enabling Framework for Regulatory Sandbox by RBI

The Reserve Bank of India (RBI) set up an inter-regulatory Working Group (WG) in July 2016 recommended to introduce an appropriate framework for a **Regulatory Sandbox (RS)** within a well-defined space and duration where the financial sector regulator will provide the requisite regulatory guidance, to increase

efficiency, manage risks and create new opportunities for consumers. Therefore, RBI came up with enabling framework for Regulatory Sandbox

Principles and Objectives of Regulatory Sandbox:

1. Foster responsible innovation in financial services
2. Promote efficiency
3. Bring benefit to consumers.

The proposed financial service to be launched under the RS should include **new or emerging technology, or use of existing technology in an innovative way** and should address a problem and bring benefits to consumers

Benefits of Regulatory Sandbox:

1. **Learning by Doing:** RS fosters 'learning by doing' on all sides.
   a. Regulators obtain first-hand empirical evidence on the benefits and risks of emerging technologies and their implications.
   b. Incumbent financial service providers, including banks, also improve their understanding of how new financial technologies might work, which helps them to appropriately integrate such new technologies with their business plans.
   c. Innovators and FinTech companies can improve their understanding of regulations that govern their offerings and shape their products accordingly.
   d. Finally, feedback from customers, as end users, educates both the regulator and the innovator as to what costs and benefits might accrue to customers from these innovations.
2. **Low-Cost Feasibility Check:** Users of an RS can test the product's viability without the need for a larger and more expensive roll-out
3. **Thrust to Financial Inclusion:** FinTech's provide solutions that can further financial inclusion in a significant way.
4. **Reduced dependence of the regulator on industry/stakeholder consultation**: By providing a structured and institutionalized environment for evidence-based regulatory decision-making, the dependence of the regulator on industry/stakeholder consultations only is correspondingly reduced
5. **Reduced Costs and Improved Access of Financial Services for Masses:** The RS could lead to better outcomes for consumers through an increased range of products and services, reduced costs and improved access to financial services.

Risks and Limitations of Regulatory Sandbox:

1. Innovators may lose some flexibility and time in going through the sandbox process. However, running the RS in a time-bound manner at each stage can mitigate this risk
2. The RBI or its RS cannot provide any legal waivers.
3. Post-sandbox testing, a successful experimenter may still require regulatory approvals before the product/services/technology can be permitted for wider application.
4. There is potential for some legal issues coming up, such as those relating to consumer losses in case of failed experimentation

2.4.1.1 Eligibilty

The target applicants for entry to the RS, are FinTech companies including startups, banks, financial institutions and any other company partnering with or providing support to financial services businesses, subject to the sandbox criteria laid down in these guidelines.

The focus of the RS will be to encourage innovations intended for use in the Indian market in areas where:

i. there is absence of governing regulations.
ii. there is a need to temporarily ease regulations for enabling the proposed innovation.
iii. the proposed innovation shows promise of easing/effecting delivery of financial services in a significant way.

2.4.1.2 Design Aspects of Regulatory Sandbox

2.4.1.2.1 General Aspects

1. **Cohort Based Process with Limited Entities**: The RS may run a few cohorts (end-to-end sandbox process), with a limited number of entities in each cohort testing their products during a stipulated period. Cohort means a group of people with a shared characteristic. In context of Regulatory Sandbox, it means that a single sandbox will consist of testing in one area so that all related entities can participate in that
2. **Theme Based Sandboxes**: The RS shall be based on thematic cohorts focussing on financial inclusion, payments and lending, digital KYC, etc.
3. **Time period**: The cohorts may run for varying time periods but should ordinarily be completed within **six months**.

2.4.1.2.2 List of Innovative Products/Services to be Permitted

- Retail payments
- Money transfer services
- Marketplace lending
- Digital KYC
- Financial advisory services
- Wealth management services
- Digital identification services
- Smart contracts
- Financial inclusion products
- Cyber security products

2.4.1.2.3 List of Innovative Technologies Permitted

- Mobile technology applications (payments, digital identity, etc.)
- Data Analytics
- Application Program Interface (APIs) services
- Applications under block chain technologies
- Artificial Intelligence and Machine Learning applications

2.4.1.2.4 Exclusion from Sandbox Testing

The entities may not be suitable for the RS if the proposed financial service/Technology is like those that are already being offered in India unless the applicants can show that either a different technology is being gainfully applied or the same technology is being applied in a more efficient and effective manner.

An indicative negative list of products/services/technology which may not be accepted for testing is given below.

- Credit registry

- Credit information
- Crypto currency/Crypto assets services
- Trading/investing/settling in crypto assets
- Initial Coin Offerings, etc.
- Chain marketing services
- Any product/services which have been banned by the regulators/Government of India.

2.4.1.2.5 Relaxations for Applicants

The RBI may consider relaxing, if warranted, some of the regulatory requirements for applicants for the duration of the RS on a case-to-case basis. A few of the examples of regulatory relaxation which may be granted are given below:

- Liquidity requirements
- Board composition
- Management experience
- Financial soundness
- Track record

RS is for temporary Relaxations and Not Permanent Approval: The RBI will provide the appropriate regulatory support by relaxing specific regulatory requirements (which the sandbox entity will otherwise be subject to), where necessary, for the duration of the RS. The RBI shall bear no liability a rising from sandbox process and any liability arising from the experiment will be borne by the applicant as a sandbox entity.

Upon successful experimentation and on exiting the RS, the sandbox entity must fully comply with the relevant regulatory requirements. The applicant should clearly understand the objective and principles of the RS. It must be emphasized that the RS is not intended and cannot be used to circumvent legal and regulatory requirements.

Areas of No Relaxation: However, the requirements that shall mandatorily be complied with by the applicants where no relaxation shall be provided are given below:

- Customer privacy and data protection
- Secure storage of and access to payment data of stakeholders
- Security of transactions
- KYC/AML/CFT requirements
- Statutory restrictions

2.4.1.2.6 Fit and Proper Criteria for Applicants

Every applicant shall satisfy the following conditions:

a. It should either be a **company incorporated and registered in India** or **banks licensed to operate** in India. Further, **financial institutions** constituted under a statute in India would also be eligible.
b. The entity shall have a minimum **net worth of Rs. 25 lakhs** as per its latest audited balance sheet.
c. The promoter(s)/director(s) of the entity should be fit and proper
d. The **conduct of the bank accounts** of the entity as well its promoters/directors should be satisfactory.
e. The **credit history** of the promoter(s)/director(s)/ entity shall be satisfactory.
f. It should demonstrate that the products/services are **technologically ready** for deployment in the broader market.

g. The entity must demonstrate arrangements to ensure **compliance with the existing regulations/laws on consumer data protection and privacy**.
h. There should be **adequate safeguards built in its IT systems** to ensure that it is protected against unauthorized access, alteration, destruction, disclosure or dissemination of records and data.
i. The entity should have **robust IT infrastructure and managerial resources**. The IT systems used for end-to-end sandbox processing shall provide end-to-end integrity of information processing.

2.4.1.2.7 Boundary Conditions

The appropriate boundary conditions should be clearly defined for the RS to be meaningfully executed while sufficiently protecting the interests of consumers. The boundary conditions for the RS may include the following:

- Start and end date of the RS
- Target customer type
- Limit on the number of customers involved
- Transaction ceilings or cash holding limits
- Cap on customer losses

2.4.1.2.8 Consumer Protection

1. RS does not limit the sandbox entity's liability towards its customers. Any loss or legal challenge is the responsibility of the sandbox entity itself
2. The entities entering the RS must, in an upfront and transparent way, notify test customers of potential risks and the available compensation and obtain their explicit consent in this regard.

2.4.1.3 Stages of Regulatory Sandbox

Each cohort of the RS shall have the following five stages and timeline:

Stage	Duration	Explanation
Preliminary Screening	4 weeks	The applications shall be received by the FTU and evaluated to shortlist applicants meeting the eligibility criteria
Test Design	4 Weeks	The FTU shall finalize the test design through an iterative engagement with the applicants and identify outcome metrics for evaluating evidence of benefits and risks.
Application Assessment	3 Weeks	The FTU shall vet the test design and propose regulatory modifications, if any.
Testing	12 Weeks	The FTU shall generate empirical evidence to assess the tests by close monitoring.
Evaluation	4 Weeks	The FTU shall assess the outcome reports on the test and decide on whether the product/service is viable and acceptable under the RS.

2.4.1.4 Regulatory Sandbox by RBI – Opening of First Cohort

RBI in November 2019 announced first cohort for Regulatory Sandbox. The Theme was '**Retail Payments**'

Why Focus on Retail Payments?

1. **Financial inclusion**: The adoption of 'Retail Payments' as the theme is expected to spur innovation in digital payments space and help in offering payment services to the unserved and underserved segment of the population.
2. **Cashless Experience to Consumers**: Migration to digital modes of making a payment can obviate some of the costs associated with a cash economy and can give customers a friction-free experience.

Innovative Products Considered for Inclusion

1. **Mobile payments including feature phone-based payment services**: Feature phones are phones with basic functionalities and are not like smart phones. Lot of work has been done for payments through smart phones but still not needs to be done in area of payments through feature phones
2. **Offline payment solutions**: Though mobile internet speed has risen; connectivity issues remain unresolved in large areas. Therefore, providing an option of off-line payments through mobile devices for furthering the adoption of digital payments is required.
3. **Contactless payments**: Contactless payment allows consumers to pay for goods and services using their debit or credit cards with RFID technology—also known as chip cards—or other payment devices without the need to swipe and enter a personal identification number (PIN). Contactless payments, while decreasing the time taken for payment checkout, also ease payments for small ticket payment transactions.

2.4.1.5 Regulatory Sandbox by RBI – Opening of Second Cohort

Post announcement of commencement of Test Phase under the First Cohort on Retail Payments in November 17, 2020, the Reserve Bank announced opening of Second Cohort under the Regulatory Sandbox (RS) with '**Cross Border Payments**,' **as its theme**.

Why Focus on Sandbox related to Cross Border Payments?

1. **Largest Recipient of Inbound Remittances**: India is the largest recipient of inbound remittances across the globe accounting for 15% of global share
2. **High Turnover in OTC markets for Foreign Exchange**: Further, the daily average turnover of OTC foreign exchange instruments in India is approximately $40 bn.

The Cohort is expected to **spur innovations** capable of recasting the **cross-border payments** landscape by leveraging new technologies to meet the **needs of a low cost, secure, convenient and transparent system in a faster manner**.

Eligibility Criteria

1. **Net Worth Requirement**: To encourage innovation and broad base the eligibility criteria, the enabling framework has been modified by reducing net worth requirement from the existing ₹25 lakh to ₹10 lakh.
2. **Business Entity Form**: The framework for RS allowed only companies but, in this cohort, even Partnership firms and Limited Liability Partnership (LLPs) to participate in the RS.

2.4.1.6 Regulatory Sandbox by RBI – Opening of Third Cohort

The Reserve Bank had announced the theme for the Third Cohort under the **Regulatory Sandbox (RS) as 'MSME Lending'**

Why Focus on Sandbox related to MSME Lending'?

The MSME segment has emerged as the growth engine of Indian economy contributing significantly to the economic and social development of the country by fostering entrepreneurship and generating large employment opportunities through business innovations,"

A cohort on MSME Lending is expected to spur innovations that can fill the lending gap for MSMEs through the innovative use of technology and data analytics.

2.4.1.7 Regulatory Sandbox by RBI – Opening of fourth Cohort

The Reserve Bank had announced the theme for the **Fourth Cohort under the Regulatory Sandbox (RS) as 'Prevention and Mitigation of Financial Frauds'**

Why Focus on Sandbox related to "Prevention and Mitigation of Financial Frauds"?

With a view to preparing the fintech ecosystem, The focus would be on using technology to reduce the lag between the occurrence and detection of frauds, strengthening the fraud governance structure and minimising response time to frauds.

The experiments under this sandbox will be on using technology to reduce the lag between the occurrence and detection of frauds, strengthen the fraud governance and structure and minimising the response time to frauds.

2.4.1.8 Regulatory Sandbox by RBI – Opening of Fifth Cohort

The Reserve Bank had announced the theme for the **Fifth Cohort under the Regulatory Sandbox (RS) as 'Neutral'**

Based upon the feedback received from various stakeholders, and in order to foster continuous innovation in various areas pertaining to fintech as well as to provide testing platform to the different products/ services/ technology which fall under the domain of the Reserve Bank of Enabling Framework for Regulatory Sandbox, it is announced that the Fifth Cohort under Regulatory Sandbox will be themed as neutral.

2.4.2 Enabling Framework for Regulatory Sandbox by SEBI and IRDAI

- The IRDA also notified the **Insurance Regulatory and Development Authority of India (Regulatory Sandbox) Regulations, 2019** to strike a balance between the orderly development of the insurance sector on one hand and the protection of interests of policyholders on the other, while at the same time facilitating innovation. The idea is to facilitate innovation in **InsurTech** space
- SEBI also proposed a regulatory sandbox for market related financial products offered by the entities regulated by them

2.5 Areas of Concern for Future Development of Fintech in India

FinTechs will confront several opportunities and challenges in the future. Broadly, they need to address following concerns to become more efficient, reliable, equitable and resilient.

1. **Cross Border Payments are still Unchartered Territory**: Despite immense scope for innovation, **cross-border payments are still unchartered territory** for FinTechs.
2. **Concerns regarding Data use, Protection and Privacy**: The increasing popularity of FinTechs **could exacerbate data use, protection and privacy** concerns if the statutory rights and obligations of service providers are not clearly delineated.
3. **Need to Ascertain the impact of FinTech on financial stability:** There is a need to **ascertain the impact of FinTech on financial stability**, due to higher potential for system-wide risk with its expansion. Lending standards could weaken due to wider credit access and higher competition.
4. **Inequality of access to FinTech services**. Despite having the world's second largest Internet user base, the access to Internet is still highly biased towards the urban, male and affluent population segments.
5. **Issue of consumer protection and digital education**.

6. **Regulatory and Compliance laws:** Many laws inevitably contribute to the slowdown of the Fintech start-ups in Indian financial markets. Not only are these regulations challenging to cope with, but they also make it difficult for Fintech players to enter the Indian markets.
7. **Trust in Cash:** Most Indians follow a conservative approach when it comes to daily transactions and end up using cash.
8. **Industry-Related Complexities:** Fintechs are designed to work with a sophisticated working model. This makes it difficult for them to maintain a smooth relationship with other financial institutions like banks. Banks, on the other hand, fear to work with Fintechs risking reputation loss.
9. **Neutral Conduct of Regulators**.
    - The **Report of the Working Group on FinTech and Digital Banking** (RBI, 2018) cautions that regulators should **neither overprotect incumbents**, **nor unduly favour newcomers** by applying differential regulatory treatment.

2.6 Way Forward

1. **Prioritised security measures for digital payments**: These measures have significantly increased customer confidence and safety leading to increased adoption of digital payments. Fintech firms need to further promote the use of these measures to ensure less risk and more confidence to the user
2. **Management of Cyber Risks**: Fintech firms needs to properly encrypt the data flowing between different system along with hi-tech firewalls to protect their systems. They should design and **implement cyber-risk prevention frameworks** and regularly conduct penetration tests
3. **Data Protection**: Efficient techniques such as masking of data along with other advanced techniques must be used to protect data from any external access.
4. **Compliance with Regulatory Norms**: They should not expect any relaxation in terms of regulatory norms because even though regulations act as barriers, but they also do provide financial stability and are in the long-term interest of the industry
5. **High degree of interoperability among start-ups**: Ensuring a **high degree of interoperability** among start-ups is key to ensure a coordinated response to market demand and changing attitudes.
6. **Bridge the digital divide**
7. **Need for collaboration between Banks and Fintech in India:** FinTech firms should no longer viewed by banks as disruptive forces. There is evidence that FinTechs are acting as **enablers in banking and finance**. Banks are relying on a number of strategies to embrace technological innovation, ranging from **investing in FinTech companies** and **launching FinTech subsidiaries**, to **collaborating with FinTechs** for various operational functions.

- There are synergies to be explored between FinTechs and banks.
    - FinTechs, while possessing **vast technological knowhow** and new ideas, **lack a large client base** and the **expertise to navigate the regulations** and licensing discipline of the finance industry.
    - Traditional banks possess a major strength - **reputation for trustworthiness** built over several decades.
    - Banks have capital and can weather intense competition. They also have the benefit of experience and tried-and-tested infrastructure alongside specific knowledge of risk management, local regulations and compliance.
    - Banks and FinTech firms have different comparative advantages and a strategic collaborative partnership between the two would liberate them to focus on their respective core competencies