

What is Fintech

- As the word suggests 'Finance' + 'Technology'
- Financial industry innovates & improves financial services by use of technology
- Traditionally, large Banking and Financial institutions have been resistant to change due to their legacy IT systems.
- Scope for innovation is restricted as they are under constant scrutiny by regulatory bodies and their agility for customer acquisition and service was bound by tedious processes.
- The FinTech industry came been under focus recently with Berkshire Hathaway's investment into Paytm for Rs 2500 crore marking Warren Buffett's first investment in India.
- "The Indian fintech ecosystem is the third largest in the globe. \$6 billion investments have already happened in fintech market in the country in the last 3-4 years. Fintech market in India is likely to expand to \$31 billion in 2020," – Niti Aayog CEO Amitabh Kant in May 2019.
- FinTech is amongst the most thriving sectors at present in terms of both business growth and employment generation. Globally, the FinTech software and services industry is estimated to touch \$ 45 billion by 2020, growing at a CAGR of 7.1% - source : NASSCOM – February 2020

Traditional banks & FI

Traditional Banking Institution Strengths

- Have a very strong existing customer base and relationships that have been in place for years. They still retain the lion's share of consumer accounts across the spectrum of financial services.
- Convenience of in-person touchpoints at branch offices to solidify relationships with clients — even as they build out their digital strategies.
- Big national banks & NBFCs have better capital to invest in their own digital transformation initiatives like such as mobility, artificial intelligence, machine learning, and big data analytics.

Traditional Banking Institution Weaknesses.

- The traditional financial institutions still have significant work to do to repair consumer trust damaged during the last recession.
- concerns improving consumers' digital experience. While financial resources are being allocated to create new digital offerings, many of these initiatives are not well integrated with their more established call center or operations.
- The complexity of existing systems — built on generations of difficult-to-integrate legacy technologies — combined with an incumbent culture that may not be optimized for today's digital marketplace.

Example : The rigidity and complex procedure of availing unsecured loans from traditional route was time-consuming, tedious, non-transparent and was not at all consumer friendly. Fintech's with all its process being done online has helped solving these issues. Applying, processing, verification of application everything is done online so saves a considerable amount of time. Disbursal of loan is also done online in fact even in 24 hours in some cases. The procedure here is really flexible and is really transparent as well. Additionally the conventional system was more focused on lending to the employees who were employees in A or A+ category companies whereas Fin techs were focused on all employees of registered companies. This way Fintech were successful in winning the trust of customer and in becoming their first choice for financial requirements

Key innovations related to Fintech

Smart Chip Technology

- Smart chip ATM cards have significantly helped in minimizing the financial loss that occur in the case of mishaps. It comes with EMV technology that is embedded in the chip. This technology uses a one-time password for each transaction. This increases the security since the code is valid only for one transaction; so, even if somebody steals it, he won't be able to do anything.

Biometric Sensors

- Biometric sensors along with Iris scanners are path breaking since it would simply eliminate the need to carry your plastic card. Furthermore, you won't need to remember your pin.
- ATMs more secure than ever since you'll be able to access your own account without any password. The biometric ATMs use integrated mobile applications, fingerprint sensors, palm, and eye recognition to identify the account's owner.
- The usage of biometric technology brings a huge sigh of relief for all the customers who get panic even at the thought of losing their ATM card. It's because due to this, they would be able to access their funds even when they have lost their card.

Key innovations related to Fintech

Online Transactions

- Massive increase in the online payments due to the emergence of e-Commerce

Omni-channel & branchless banking

- FinTech financial services is transforming the entire banking system from a branch-specific process to various digital channels such as online, social, and mobile. It also reduces the bank's dependency on its brick and mortar branches to function.

Customer service chatbots

- Chatbots are nothing but bits of software that use machine learning and natural language processing that enables them to constantly learn from human interaction.
- Chatbots are highly efficient as they streamline customer interactions like query handling and directing customers to the required departments.
- Bank of America's chatbot Erica, which can provide investment advice to its customers. Whereas, the chatbot used by UBS can scan customer emails autonomously thus reducing the total time taken in the task from 45 minutes to mind-boggling two minutes.

Artificial intelligence (AI)

- AI along with Machine learning is vital for fraud detection. The software that banks use for fraud detection generates alerts whenever there's a potential fraudulent transaction. Later it is backed up by the human investigation that finally determines if the attack was real or false.

Fintech Strengths & weaknesses

Fintech Strengths.

- No legacy from past
- The media buzz trended positive in their favor
- Main strength revolves around the innovations that are closely associated with their brands.
- They bring a fresh image that has a certain appeal to those consumers who still carry some bitter experiences with traditional banks.
- Fintechs focus on providing a focused best of breed service around specific financial offerings. They do not pretend to be a one-stop shop for all financial needs. Consequently they have been able to make inroads with consumers who care about narrow aspects of their financial lives.

Fintech Weaknesses.

- Their narrow focus, however, is also the source of their biggest vulnerability. J.D. Power research clearly indicates that there are serious concerns from consumers about managing a fragmented set of financial resources.
 - A significant percentage of consumers — even among Millennials — are not necessarily excited about using different providers to manage deposits, borrow, invest, and plan their retirement. The narrow focus also limits the touchpoints that lead to the development of trusted relationships. This is a challenge exacerbated by most fintech's' choice to limit their interactions with consumers to digital channels.
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Fintech & Banks partnership – Win win situation

By combining the stability, product variety, customer knowledge and financial strength of traditional banks and NBFCs with the data enrichment, user experience and modern platforms that quality fintech firms can provide, both can build an amazingly rewarding experience for each other and their customers.

- Emergence of FinTech companies has been a win-win situation for both start-ups and larger institutions. Start-ups are typically more flexible and agile equipped with more modern technology expertise and innovation capabilities. By collaboration, larger institutions can gain access to new technologies, whereas start-ups can gain access to funding sources and large customer bases.
- Challenging for start-ups to ensuring regulatory compliance and fraud free payment systems are very difficult to manage for any start-up, so currently most FinTechs are still built on top of existing processes and systems of well established institutions and payment systems. To maintain the dominance banks have enjoyed up to this point, they need to radically redesign their customer-facing assets. If banks fail to overhaul their exteriors to offer a personalized, best-in-class product experience, they will be relegated to supplying the engine for sleeker-looking tech companies in 10 years' time.
- Additionally, the hectic pace of change in payment systems – online, mobile, virtual wallets and smart watches, among others – means that all businesses need to remain alert to the latest trends and developments. Central bank needs to support FinTech phenomena by addressing customer protection issues and ensure authenticity of transactions.

Fintech & Banks partnership – Win win situation

- Here are the top 5 reasons the combination of fintech solutions and legacy banking organizations bring a winning synergy for the future:
- Fintech improves the health of traditional financial institutions by enhancing performance and improving profitability. When traditional FI see fintech firms as partners in this journey, rather than firms selling products, the opportunities begin to expand.
- Fintech solutions provide a way for legacy financial institutions to improve customer retention and preference. Data enrichment is an extremely powerful tool that quality fintech firms bring to the game.
- Fintech firms provide an opportunity to enhance loan portfolio diversification. When you have the ability to become more granular with each customer, you are more likely to find (and offer) consumers the exact products they need, when they need them.
- Fintech partnerships can help solve industry-specific points of pain, like securing credit card processing, transferring money, and processing loans quickly. With a strong fintech partnership, traditional financial organizations benefit from the leverage of a state of the art, secure network that can manage time-consuming and lengthy tasks quickly and effortlessly.
- Fintech data can provide financial institutions a keener insight into what their customers are doing with their money. This again speaks to the power of data enrichment fintech partnerships can provide. Further, the power of the cloud that quality fintech firms have tapped is another tool in delivering product offers and services specifically tailored to individual customers in real time.

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Fintech in Insurance world

- Insurance carriers are now making the leap into the 21st century. They have little choice. If they fail to deliver against the ever increasing demands and expectations of customers they will lose share to traditional rivals that do succeed in striking the right chord. And to new entrants that have the advantage of digital DNA to leverage technology to provide lower costs and better service.
- The insurance industry is facing intense competition as other industries have started providing alternative financial solutions to insurance. For instance, banks are providing loans to aid immediate financial losses, and industries like healthcare are providing medical membership as an alternative to insurance. There is a need for insurance companies to stand out from the competition, and they can achieve it with the help of fintech. Here are some of the services that insurance companies can provide to get an edge over the competition:
- **Personalized Insurance**
 - For instance, health insurers can make use of patient data to get an insight into the medical condition and behaviour of a person. And they can offer personalized medical insurance that covers normal or life-threatening medical conditions that the person might suffer based on his or her behaviour.
 - IoT can help vehicle insurers can monitor the driving habits of the insured. Insurers can then provide personalized insurance based on the driving habits of the insured.

Fintech in Insurance world

- **Improved Security**

- Using advanced technologies like **blockchain and AI can impact the insurance industry** in many different ways. For instance, the use of blockchain's decentralized ledger will help insurers to keep their customer's data more secure.

- **Enriched Connectivity**

- Artificial Intelligence Solutions can avoid friction at many touch points in the customer journey. Chatbots will be able to understand and act on customer query at any time.
- Customers are ready to leave the manual claims processing behind.

- **Online Marketplace**

- In the Indian insurance sector, From purchasing a policy to raising a claim, the process was time consuming, resource driven, and paper intensive. Technology has addressed these concerns and awakens the giant.
- In today's tech-savvy age, **insurance claims can be settled within a day, if not hours.**

- **Exponential Growth**

- FinTech has created an ecosystem which is conducive for exponential growth. **A few clicks and you can avail your [car insurance](#) instantly.**

- **Customized Pricing**

- Insurance premiums are traditionally priced based on certain generic factors. For example, car insurance premium depends upon car's make, model, age, location, etc. With technology, insurance companies can access data that will shift the premium pricing model from generic to specific. **Thus, a driver who is cautious doesn't speed much, and travels a route which is not prone to accidents, will pay less premium compared to a rash driver who often takes his car on long trips.**

Business benefits to Insurance companies

- 1. Superb customer engagement :** Solutions that help insurers to make a leap in customer engagement, to become much more effective in every step of the customer journey.
- 2. Dramatic cost savings :** Fintechs that provide innovative solutions that impact the key cost drivers. Think of solutions for improved claims management, fraud detection, more cost effective customer acquisition and cost efficient service.
- 3. Sophisticated underwriting and risk reduction :** The core competence of insurance is ready for a makeover thanks to all sorts of new technologies; machine learning and cloud computing.
- 4. Disruptive business models :** Emergence of new digital first carriers, with a new business model that is clear about how it creates value for its customers.
- 5. New roles in the value chain**

Traditional agents and brokers are becoming less preferred in many mature markets because of high commissions and lack of added value. Online alternatives now enter the insurance arena.
- 6. Innovation acceleration enablers**

The systems of most insurance carriers are older than the customers they serve. Obviously, this is a major hurdle to innovation. Several fintechs are offering powerful solutions that align IT with the business demands for speed, flexibility, agility and cost efficiency.
- 7. Contextual data propositions**

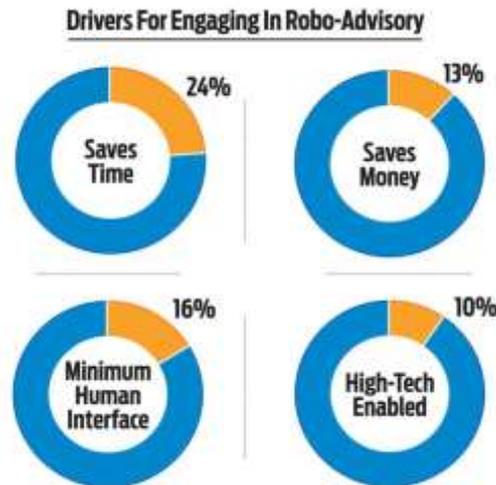
Connected objects will generate loads of new information, not only directly related to the insurance but also about the context. This will spawn much deeper customer insights and in turn these should lead to fascinating new directions for product and service innovation.

Fintech in wealth management

Asset management is a variety of bonds, stocks, and real estates of investors and how they're managed, whereas **Wealth management** is financial management services like retirement planning, estate planning, investment management, etc. offered to high net worth individuals.

Wealthtech: the new wealth management

- Fintech is giving wealth managers the opportunity to improve their service offering at a lower cost, and is giving rise to an entirely new toolset: wealthtech.
- Driven by artificial intelligence (AI) and machine learning (ML), wealthtech leverages complex algorithms to advise clients on the best choice of investment or savings plan
- For example, robo advisors



Source: Top of the Pyramid 2017 report, Kotak Wealth Management

These digital platforms take on the role of human advisors, by using algorithms to calculate and select investments based on the desired risk and objectives of prospective clients. **Micro-investing**

Govt. Initiatives to promote fintech

- **The fintech space growth has been powered by the Government of India (GOI) with introduction of innovation-supported startup landscape, friendly government regulations and policies, and a large market base.**
- NASSCOM revealed that 400 fintech firms are currently operating in India, and the number is expanding every quarter
- Some of the leading fintech space services and technologies (apart from that for cryptocurrency and software services) in India are:
 - **Remittance services:** both outbound and inbound remittance transaction are being taken up by start-ups including FX, [Instarem](#), [Remitly](#) and others, which pose a challenge to giants such as MoneyGram and Western Union.
 - **Personal finance and loans:** several websites, Loanbaba among them, have come up that are helping people access quick loans within 24 to 72 hours.
 - **Payment services:** web and mobile apps for accepting and transferring payments from businesses and individuals saw a rise after the demonetisation drive in 2016. Some fintech firms that saw a peak from then on are [Paytm](#), [Mobikwik](#) and Oxigen Wallet.
 - **Peer-to-peer (P2P) lending:** a P2P lending platform allows borrowers and lenders to communicate with each other for lending and borrowing cash, regulated by the Reserve Bank of India (RBI) norms. For example faircent.
 - **Equity funding:** crowdfunding platforms are also proliferating and adding to the finance community initiatives; for example Start51 and Wishberry.

Disruptions in Financial Services in India – Pioneered by RBI

- ***RBI pioneering fintech growth***
- RBI has given a boost to Bharat Bill Payments System and [Unified Payments Interface](#) along with P2P lending, digital payments etc. The use of automated algorithms has disrupted the industry and has made it simpler for consumers to utilise these facilities. RBI has granted several fintech entities licences to introduce payment banks that offer deposit, savings, and remittance services.
- The GOI and budding entrepreneurs have taken the fintech space by storm and the future of finance technology does show a bright prospect
- Aadhaar – Key enabler for Fintech
- eKYC -fuelled by Aadhaar
- Unified Payment Interface
- Jan Dhan (JAM stands for Jan Dhan Yojana, Aadhaar and Mobile number).
- Mobile Wallets

What is a Regulation

Regulations are rules that govern how an activity is conducted, and provide a means of enforcement if the rules are violated. Regulators are any actors who enforce those rules.

Regulation can be roughly divided into two parts

The creation and declaration of a rule

The enforcement of a rule.

How do they enforce a rule ??

- Regulators such as the RBI, SEBI and the IRDAI have extensive powers to oversee compliance with applicable laws. These include the power to:
 - authorise certain activities;
 - refuse authorisation and blacklist certain fintech activities;
 - impose conditions of business and operations;
 - audit business and operations;
 - require appropriate filings to be made with them; and
 - impose penalties for non-compliance with applicable laws and regulations.
 - Indian courts may be called to test the validity of certain laws and regulations. The courts' jurisdiction may also be invoked in situations where the position adopted by or the procedure followed by a regulator is questioned.

Fintech Regulation – Multiple bodies

- FinTech has brought about efficiency improvements, risk reduction and greater financial inclusion.
- However, Regulatory uncertainty and confusion in the FinTech sector is one of the major challenges for the rapidly evolving FinTech sector.
- The problem starts firstly because of the involvement of several regulatory bodies
 - **RBI** being the obvious stakeholder
 - **SEBI** for intermediaries in the securities market
 - **Insurance Regulatory and Development Authority (IRDA)** for insurance-related businesses.
 - **National Payments Corp. of India** also fits in due to payment related services being at the core of FinTech. The draft Payments and Settlements Systems Bill has set up an independent payments regulator.
 - The **Unique Identification Authority of India (UIDAI)** is in the mix too via Aadhaar's use and Indiastack APIs (for example e-KYC by FinTechs).
 - Though, Supreme Court's judgement left no scope for private companies using Aadhaar, Finance ministry is working on passing new legislation that would allow private companies back in.
 - Then there's the **Srikrishna Committee** for data privacy and security.
 - **PFRDA** - Pension Fund Regulatory & Development Authority
 - The **Telecom Regulatory Authority of India (TRAI)** due to the usage of internet based technologies.

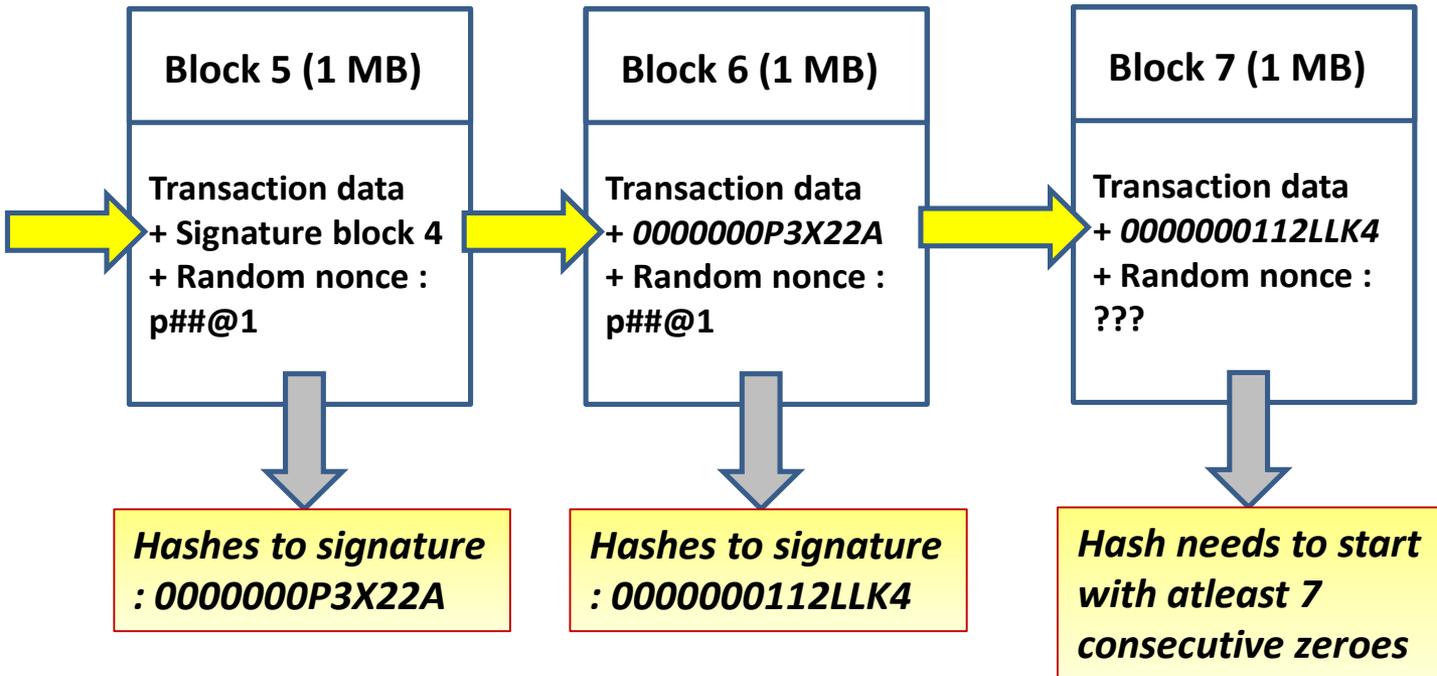
Regulatory Sandbox

- RBI has finalised guidelines for the regulatory sandbox to test innovative financial products and technologies. **The unique advantage of a [sandbox](#) is that it allows FinTech start-ups to test out new services and assess their risks before they are taken to market. FinTech firms and regulators can work together and tweak existing regulations, enabling firms to test their products for a limited time and among a limited number of customers.**
 - The entities using the sandbox must
 - define test scenarios and expected outcomes upfront.
 - report results to the RBI on ongoing basis as agreed
 - While some requirements can be relaxed for sandbox, data protect laws and KYC requirements must be complied
 - Five stages of sandbox process, which will be monitored by **FinTech Unit** at RBI
 - Stage 1 : Preliminary Screening of applications to the cohort (4 weeks)
 - Stage 2 : Finalisation of test design by the Fintech Unit at RBI (FTU) via interaction with applications. (3 weeks)
 - Stage 3 : Application assessment and vetting of test design by the FTU (3 weeks)
 - Stage 4 : Testing by the FTU based on empirical evidence and data (12 weeks)
 - Stage 5 : Testing of Final outcome of testing of product or technology that was sandboxed by FTU (5 weeks)
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Indiastack

- As India as a country matures regarding the use of Aadhaar, much of the backbone infrastructure for digital India in India, is on the framework of India Stack - driven by Aadhaar and eKYC.
- Set of APIs that allows government, businesses and developers to utilise a unique digital Infrastructure to solve India's hard problems towards presence-less, paperless, and cashless service delivery
- Minimal set of APIs and encourages the rest of the ecosystem to build custom applications on top of these APIs
- The following APIs are considered to be a core part of the India Stack.
 - Aadhaar Authentication
 - Aadhaar e-KYC
 - eSign
 - Digital Locker
 - Unified Payment Interface (UPI)
 - Digital User Consent - still work in progress.

Step 4 — When does the signature qualify, and who signs a block ?



Miners are computing in order to insert as many random nonces as possible until they find a nonce, which when combined with rest of block data, leads to hash output (signature) that starts with at least 7 zeroes

Nonce : needs to be a number

What is Distributed Ledger Technology

- A distributed ledger is simply a database that exists across several locations or among multiple participants. Most companies use a centralized database that exists in a fixed location. But a distributed ledger removes third parties from the process, which makes them quite attractive.
- Blockchain vs Distributed Ledger :
- Think of blockchain and distributed ledger in the same way as ‘Xerox’ and ‘Photocopy’. So blockchain is a type of Distributed ledger, but it is so popular that it is engrained in minds of people as what the product actually is.

Blockchain	Distributed Ledger Technology (DLT)
<ul style="list-style-type: none">• A form of DLT comprising of immutable, digitally recorded data stored in packages called blocks.• Uses cryptography to make it hard for a malicious user to manipulated the results in his favour• All Distributed ledgers do not necessarily employ blockchains.	<ul style="list-style-type: none">• A record of consensus maintained & validated by multiple parties/nodes.• A way to construct a ledger in a distributed way to achieve consensus among participants who don't trust each other.• Records new information in real time, only adds entries if consensus among participants is confirmed.• Every entry is automatically time-stamped using a unique cryptographic signature.

Some Potential real world uses of blockchain technology

- 1. Payment processing and money transfers :** with banks playing a central role removed from the equation, and validation of transactions ongoing 24 X 7, most transactions processed over a blockchain can be settled within a matter of seconds.
- 2. Monitor supply chains :**
 - By removing paper-based trails, businesses should be able to pinpoint inefficiencies within their supply chains quickly and monitor quality control.
- 3. Digital IDs :** More than 1 billion people worldwide face identity challenges. This would allow folks in impoverished regions to get access to financial services
- 4. Digital Voting :** Blockchain offers the ability to vote digitally
- 5. Real estate, land, and auto title transfers :** Instead of handling this on paper, blockchain can store titles on its network, allowing for a transparent view of this transfer, as well as presenting a crystal-clear picture of legal ownership.
- 6. Tax regulation and compliance :** Companies can use blockchain as a means to record their sales and demonstrate to lawmakers that they're abiding by laws.
- 7. Medical recordkeeping**

In addition to storing patient records, the patient, who possesses the key to access these digital records, would be in control of who gains access to that data.
- 8. Equity trading**

Blockchain could rival or replace current equity trading platforms to buy or sell stocks because blockchain networks validate and settle transactions so quickly.

Cryptocurrency

coinmarketcap.com

Top 100 Cryptocurrencies by Market Capitalization

Cryptocurrencies Exchanges Watchlist Filters USD Next 100 View All

Rank	Name	Market Cap	Price	Volume (24h)	Circulating Supply	Change (24h)	Price Graph (7d)
1	 Bitcoin	\$176,133,302,434	\$9,573.88	\$19,631,355,554	18,397,268 BTC	-1.21%	
2	 Ethereum	\$26,674,669,234	\$239.77	\$7,943,115,647	111,250,283 ETH	-1.48%	
3	 Tether	\$9,229,683,130	\$1.00	\$22,994,593,919	9,187,991,663 USDT *	0.14%	
4	 XRP	\$8,922,561,643	\$0.202267	\$1,050,429,869	44,112,853,111 XRP *	-0.68%	
5	 Bitcoin Cash	\$4,655,940,619	\$252.65	\$1,785,749,222	18,428,388 BCH	-1.58%	
6	 Bitcoin SV	\$3,547,834,775	\$192.53	\$1,215,402,807	18,427,027 BSV	-1.34%	
7	 Litecoin	\$2,991,611,735	\$46.09	\$2,149,569,302	64,902,735 LTC	-2.07%	

As on 07-jun-2020

Bitcoin :

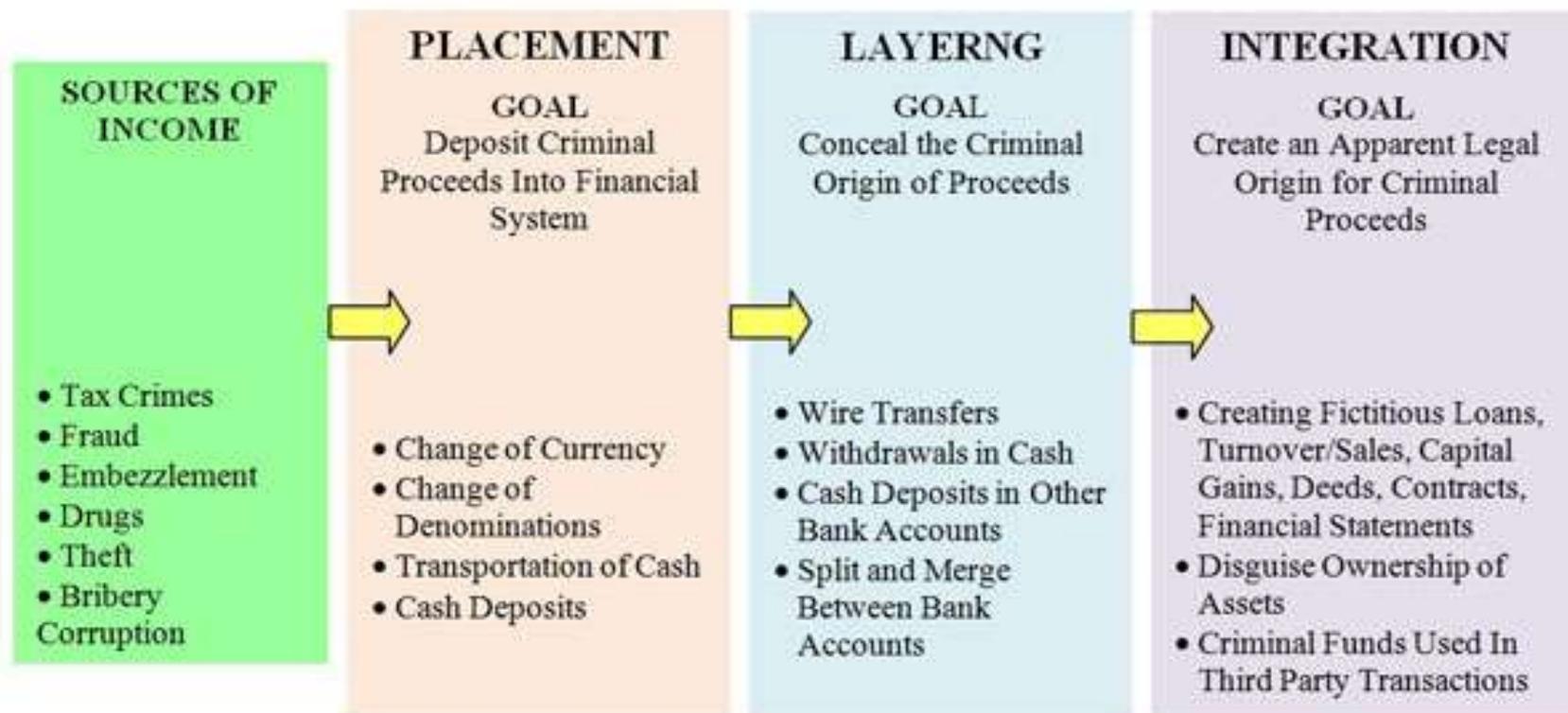
- It is presently the dominant cryptocurrency of the world. (a digital currency)
- Bitcoin was launched in 2009 by an unknown person called Satoshi Nakamoto.
- Bitcoin is a Peer-to-Peer technology which is not governed by any central authority or banks.

1. What is privacy and why is it so important

- **Definition:** The aspect of IT that deals with the ability an organization or individual has to determine what data in a computer system can be shared with third parties since it is an individual's right or desire to be left alone and/or to have the ability to control her own data
- Data Protection regulations require entities to ensure the ongoing confidentiality, integrity, availability, and resilience of processing systems and services
- While the protection of privacy is an important objective, privacy also serves as a means to protecting other ends, such as free speech
- Customers entrust data to entities for agreed purposes only; those collecting data should place a premium on protecting the customers' privacy
- Failure to ensure privacy is a breach of trust and the defaulting companies are liable to prosecution and penalty
- Privacy may be compromised in two ways:
 - Data stolen for malicious intent
 - Custodian left customer data unprotected and exposed

Money Laundering – Brief Intro

Process of Money Laundering



Pitfalls of Fintech

- Investor expectations of early payback : Fundamental strategic contradiction between Technology and Finance
 - Technology companies typically get big faster & dominate the sector*
 - In contrast, finance sector is slow moving, particularly lending. Growing a retail customer base is expensive and time consuming
 - Investors of all kinds are accustomed to the modern Tech growth curve and have a three to five-year investment horizon
- Tough to adhere to Regulatory compliances
 - There is increasing pressure on Fintech start-ups, globally, to address and deal with existing or potential regulatory hurdles
 - Most Fintechs are not as knowledgeable as large traditional players about regulatory framework.
- Difficulties in partnerships with large incumbents
 - Incumbents in the finance sector are powerful and complacent. Most don't fear Fintech companies looking to take their business because, few, if any, pose a real threat