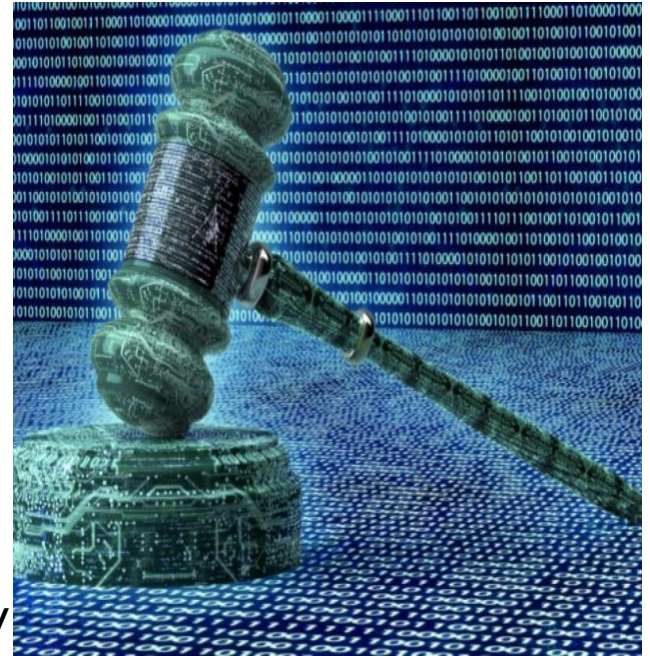


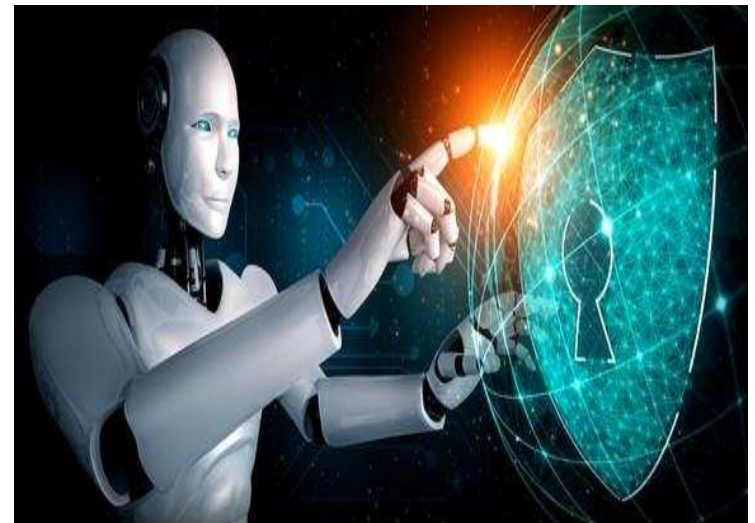
Technology & Law-Emerging Areas

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University
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Outline of the Class

- ▶ ***Fintech Law and Policy***
- ▶ ***Law and Ethics in Automation***
- ▶ ***Big Ideas in technology***



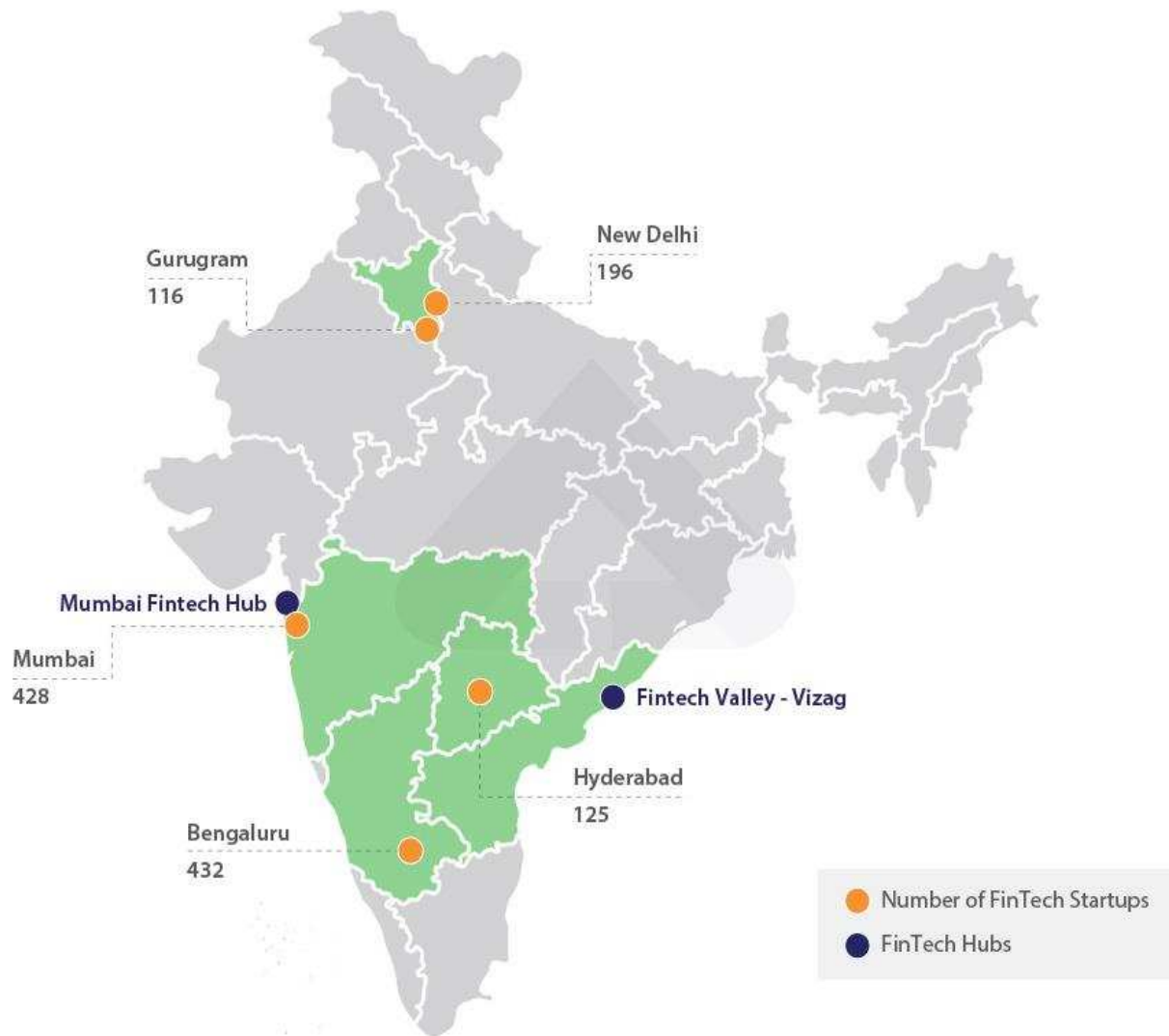
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Fintech Law and Policy



Major FinTech Clusters in India

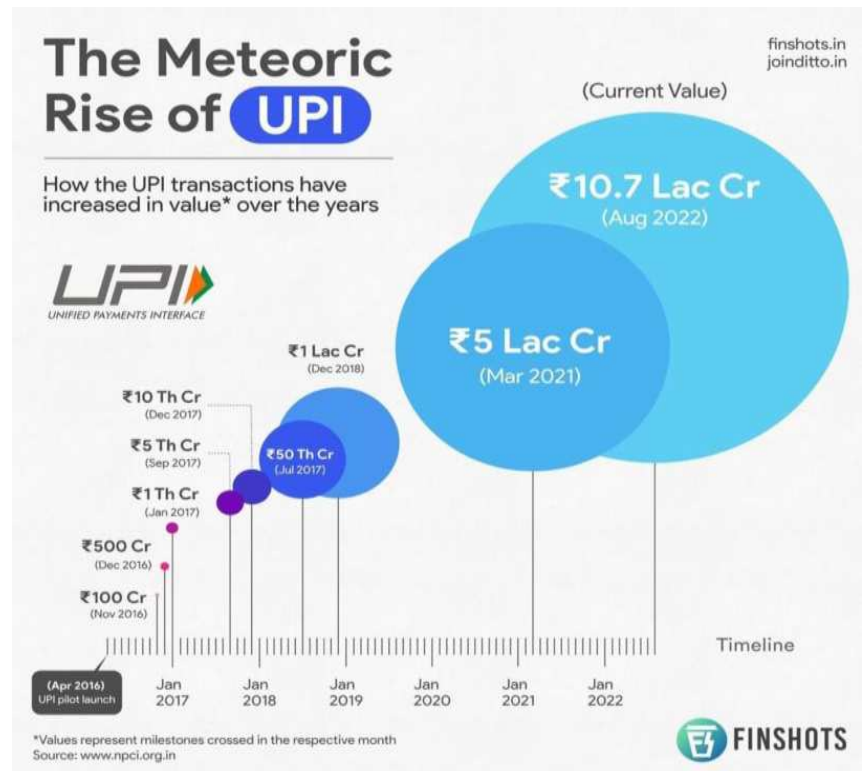


Source: Invest India

Graphic © Asia Briefing Ltd.

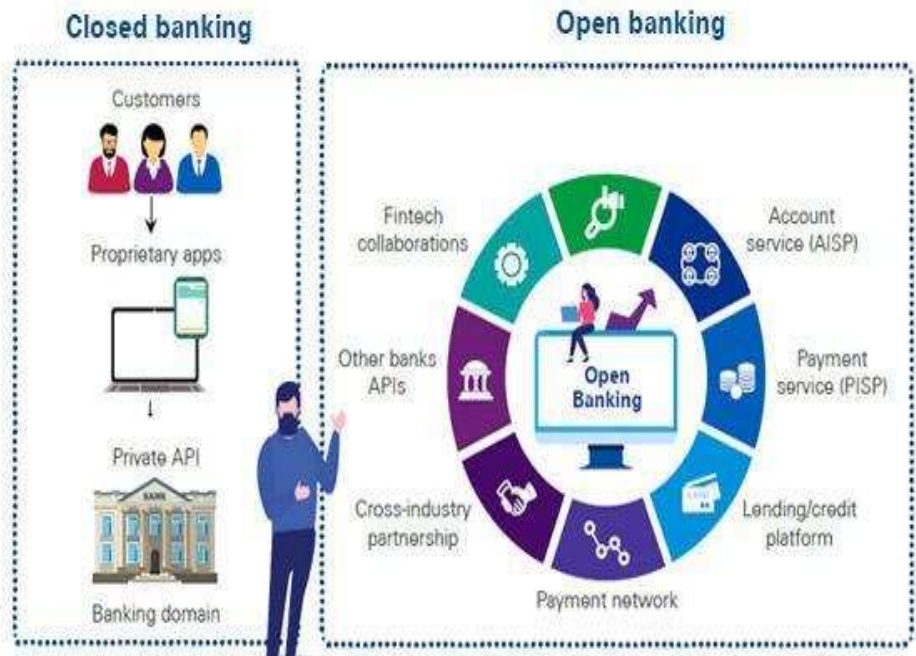
A overview of **FinTech** ecosystem

- Telecom Regulatory Authority of India (TRAI) shows that there are 726 million digital users as of September 2020, which is an impressive 278% growth from September 2016. The increase is driven by mobile internet users, who account for more than 95% of total internet users.
- **3rd largest FinTech ecosystem globally**
- It is expected that the Indian Fintech market, currently valued at \$31 Bn, will grow to \$84 Bn by 2025, at a CAGR of 22%.
- 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.



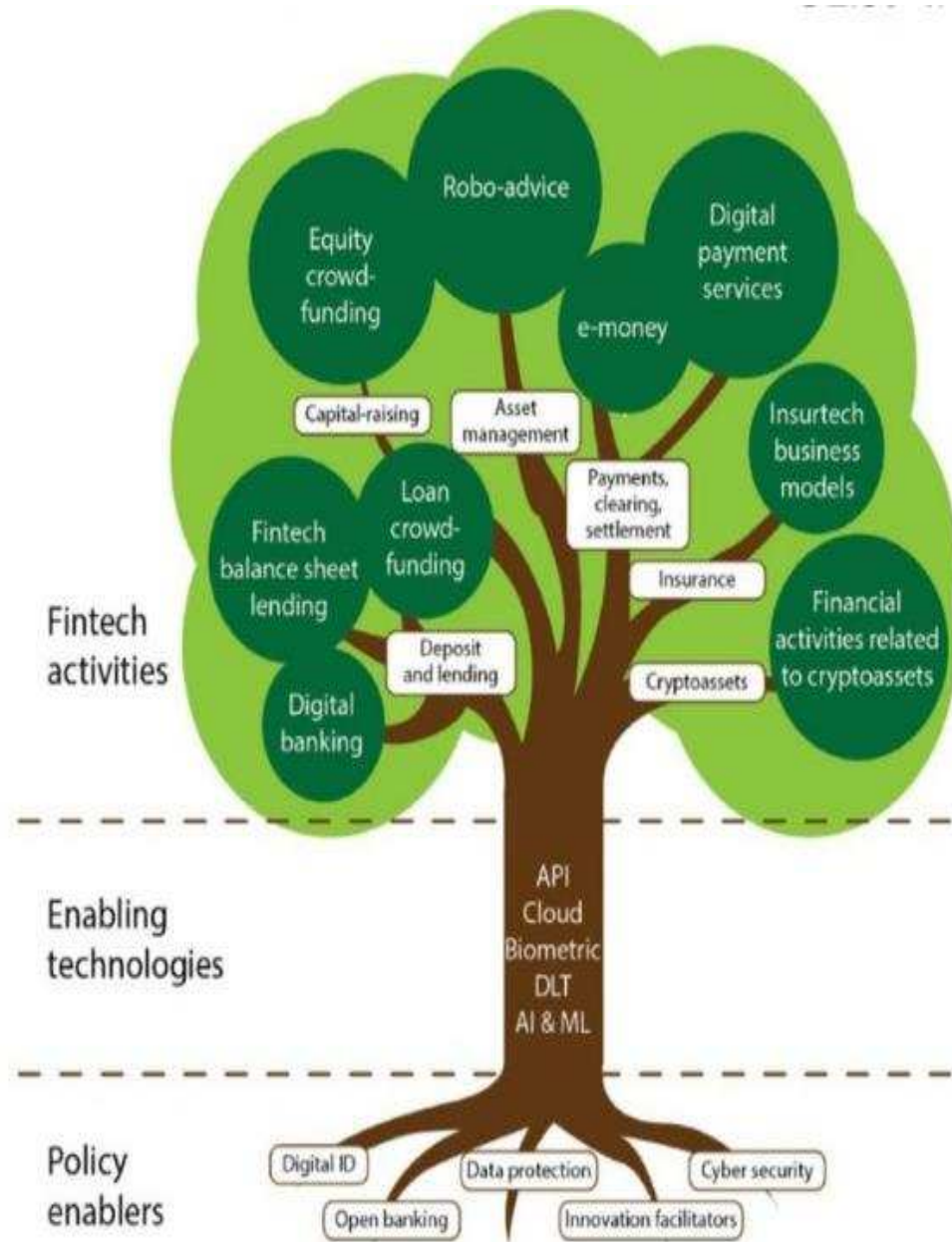
FinTech ecosystem

- In 2020, FinTech SaaS and InsurTechs saw total investments of \$145 Mn and \$215 Mn respectively, representing a 4-5X growth over their 2015 funding flow.
- Amongst India's 50+ FinTechs with more than \$100 Mn valuation, there are 4 Wealth and Broking FinTechs, 5 InsurTechs and 8 SaaS FinTechs.
- UPI is expected to grow significantly with the participation of domestic and international players (Paytm, Walmart and Google) continuing to dominate the segment, with a heavy focus on development the payments infrastructure through investments.
- Neo-banks in India are emerging as a key segment for growth in the space – with over 15 Neo-banks currently in India, several of them under development or in beta stages. The segment has been growing steadily, with several private banks partnering with these Fintechs to explore synergies and better means of service-delivery.



The FinTech Tree:

A taxonomy of the Fintech environment



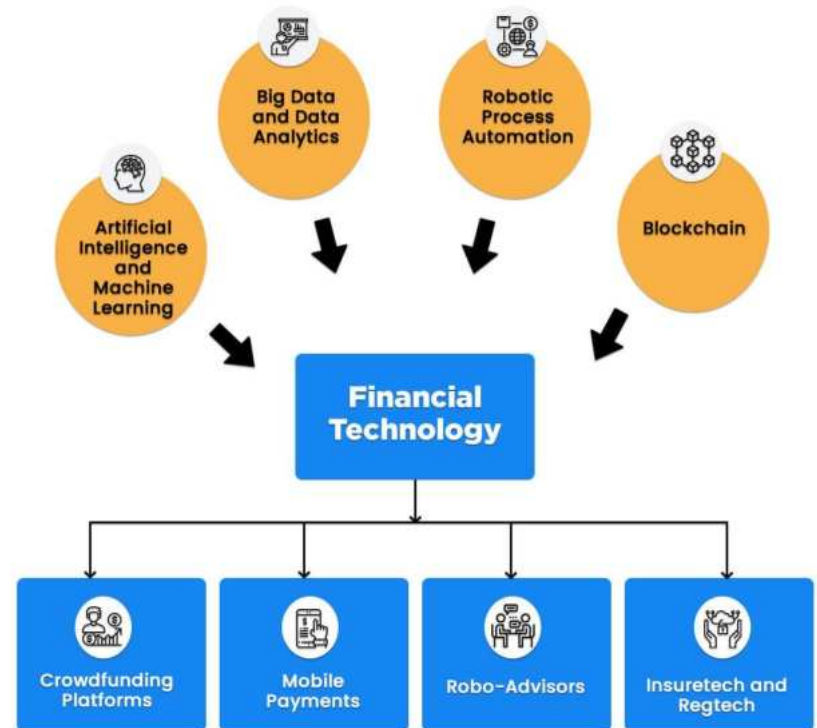
Scope of fintech

- Fintech has revolutionized many different markets, most notably the banking, trading, insurance and risk management industries.
- Fintech companies, which include startups, technology companies and established financial institutions, utilize emerging technologies, such as big data, artificial intelligence, blockchain and edge computing to make financial services more accessible and more efficient.



What is Fintech

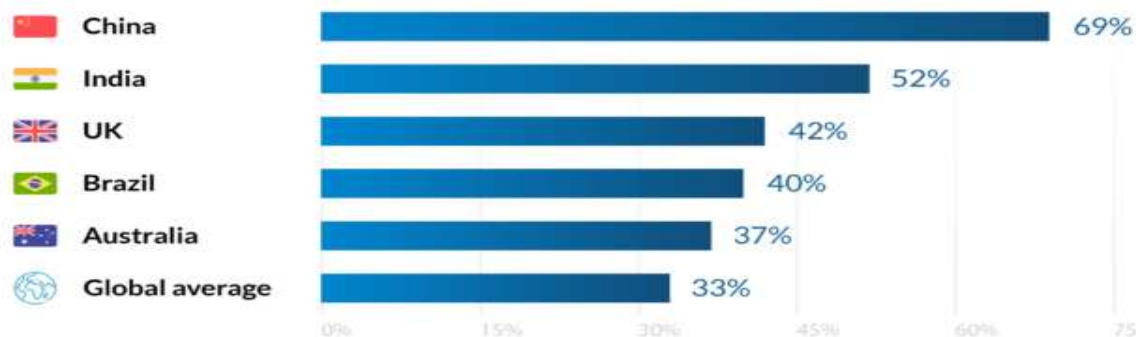
- **Oxford dictionary** defines “Computer programs and other technology used to support or enable banking and financial services.”
- “Fintech is a technical tool to support financial services”, making it simple for everyone on this planet earth along with promoting idea of “Financial Services as a basic right for every human being”.



3 Key Fintech Trends You Should Know

1 Percentage of digitally active consumers who use fintech

Source: Business Insider Intelligence



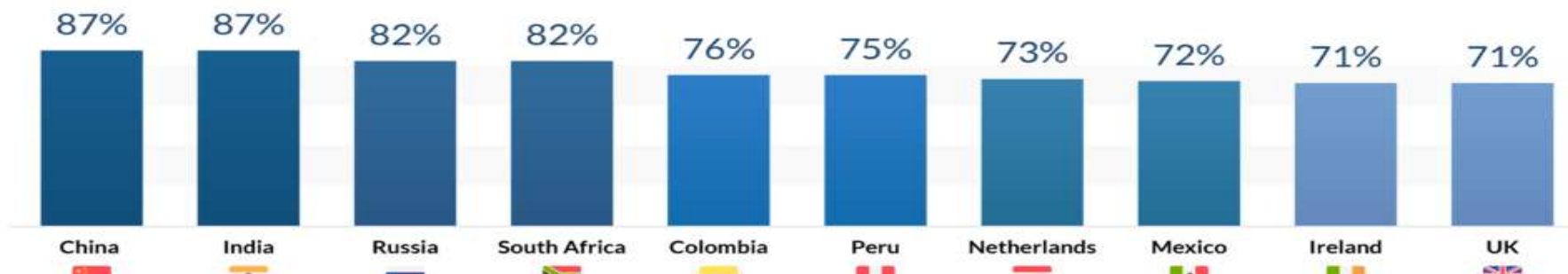
2 Key digital technologies that fintech plan to invest in in the next 12 months

Source: Deloitte 2019

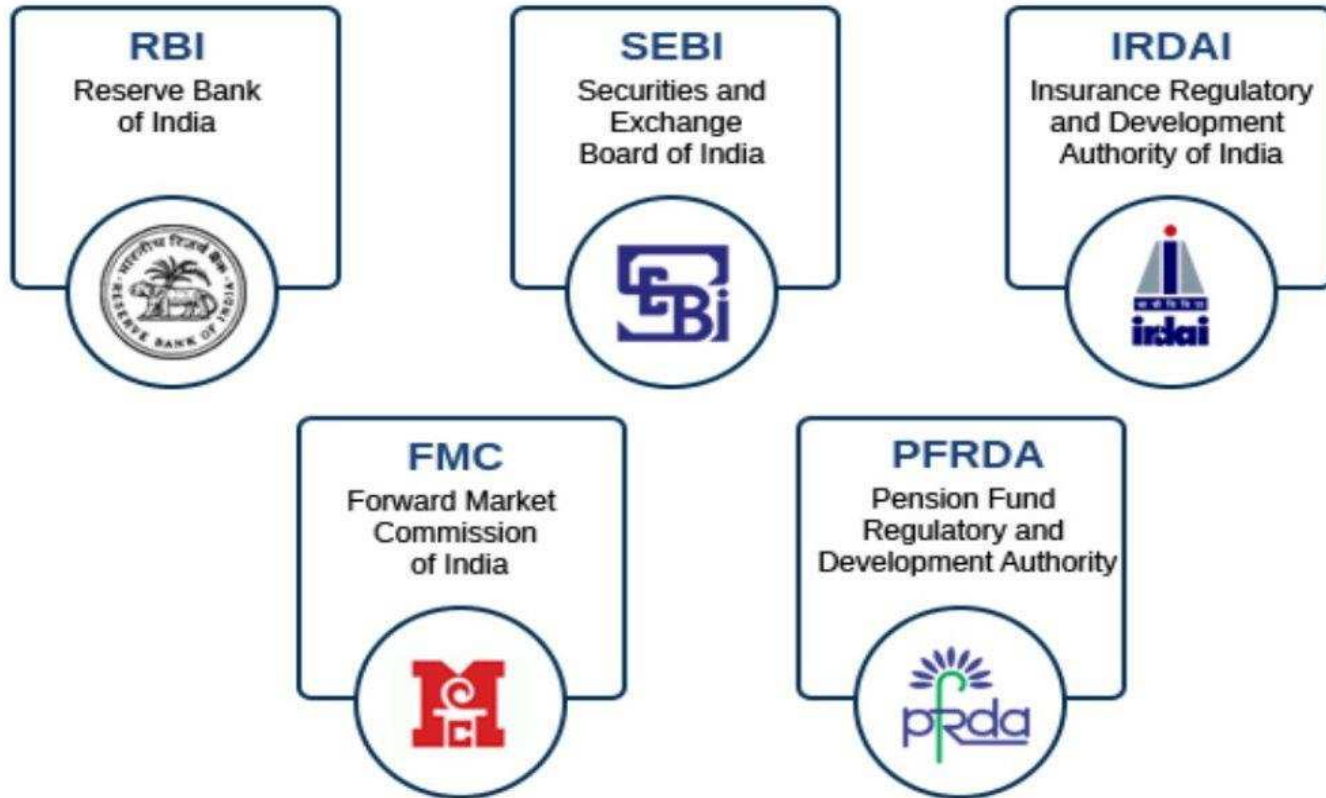


3 Consumer fintech adoption rates

Source: EY



Regulatory Bodies in India



CaseReads

Steering Committee on Fintech

- ➔ To consider various issues relating to development of Fintech space in India
- ➔ To make Fintech related regulations more flexible to enhance entrepreneurship in areas where India has distinct comparative strengths
- ➔ To evaluate how Fintech can be leveraged to enhance financial inclusion of MSMEs

CHAIRMAN

Secretary, Department of Economic Affairs

MEMBERS

Secretary, Ministry of Electronics and Information Technology

Secretary, Department of Financial Services

Secretary, Ministry of Micro, Small and Medium Enterprises

Chairperson, Central Board of Excise and Customs

Chief Executive Officer, Unique Identification Authority of India

Deputy Governor (DG), Reserve Bank of India

CONVENER

Joint Secretary (Investment), Department of Economic Affairs



➔ TERMS OF REFERENCE

- Take stock of the global developments in the sector
- Analyze the regulatory regime spread over various entities
- Consider ways to leverage it in critical sectors of the economy
- Develop regulatory interventions to enhance the role of Fintech
- Promote ease of doing business in the Fintech sector
- Means of using data with information utilities for financing MSMEs
- Work with Government agencies like UIDAI to explore creation and use of unique enterprise identification number
- Consider international cooperation opportunities in Fintech

Contactless payments

To keep payments secure, these platforms use tools called cryptograms to check that the data they receive actually originated from the customer's mobile device. That ensures stolen data can't be fraudulently resorted from another device.

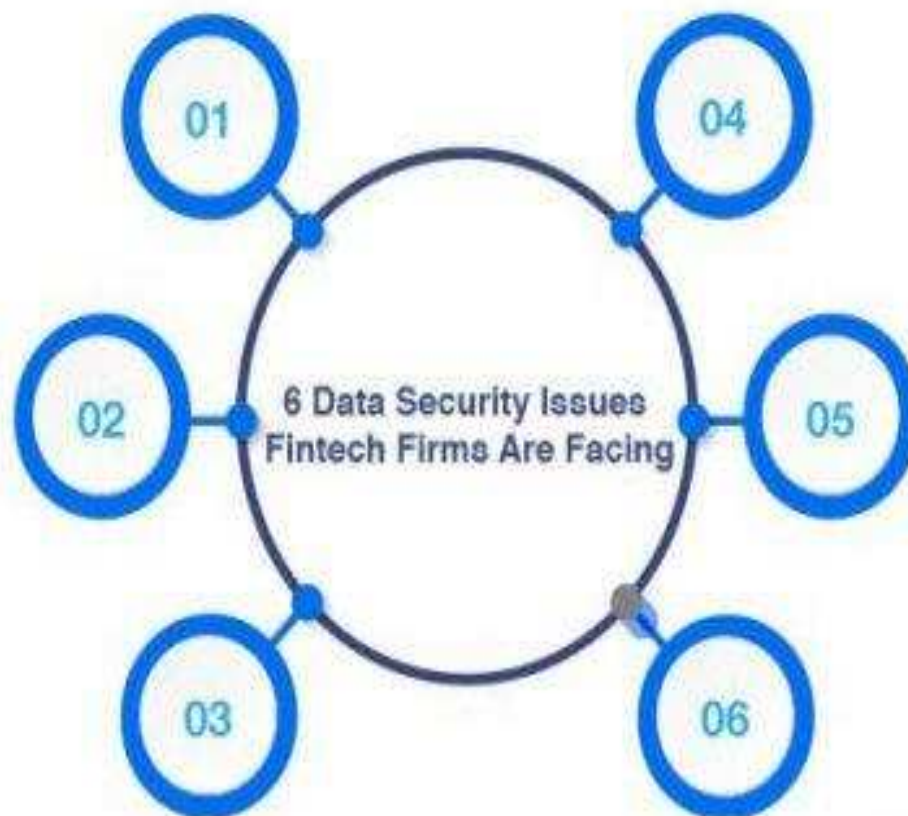
Skyrocketing traffic

That last factor, data storage, is a bigger security issue than it might seem. Either the fintech companies need to manage more servers themselves which require physical, as well as digital, protection or they need to rely on a cloud storage provider, such as Amazon Web Services.

Deep fakes

Fintech leaders are worried about deep fakes for three reasons:

- Impersonations during onboarding
- Fraudulent transfer and payments
- False directives



Integration limitations

The trouble is, cutting-edge financial technologies rarely integrate well with banks' legacy systems. Costly, custom built APIs are usually required to ensure the systems can communicate.

Insecure APIs

Fintech companies have adopted a practice called "AI fuzzing". In a nutshell, this process uses machine learning to identify potential exploits in an app's codebase ideally, before hackers can find them.

Next-level phishing

Phishing emails compromise fintech companies. One is password resets. Hackers trick users into revealing their login credentials. Another is account fees. Often, these emails encourage the user to share his or her credit card numbers over the phone.

Key Challenges in Fintech Regulation

Data Privacy

- Rise of misuse of consumer data
- Consent based access to consumer data

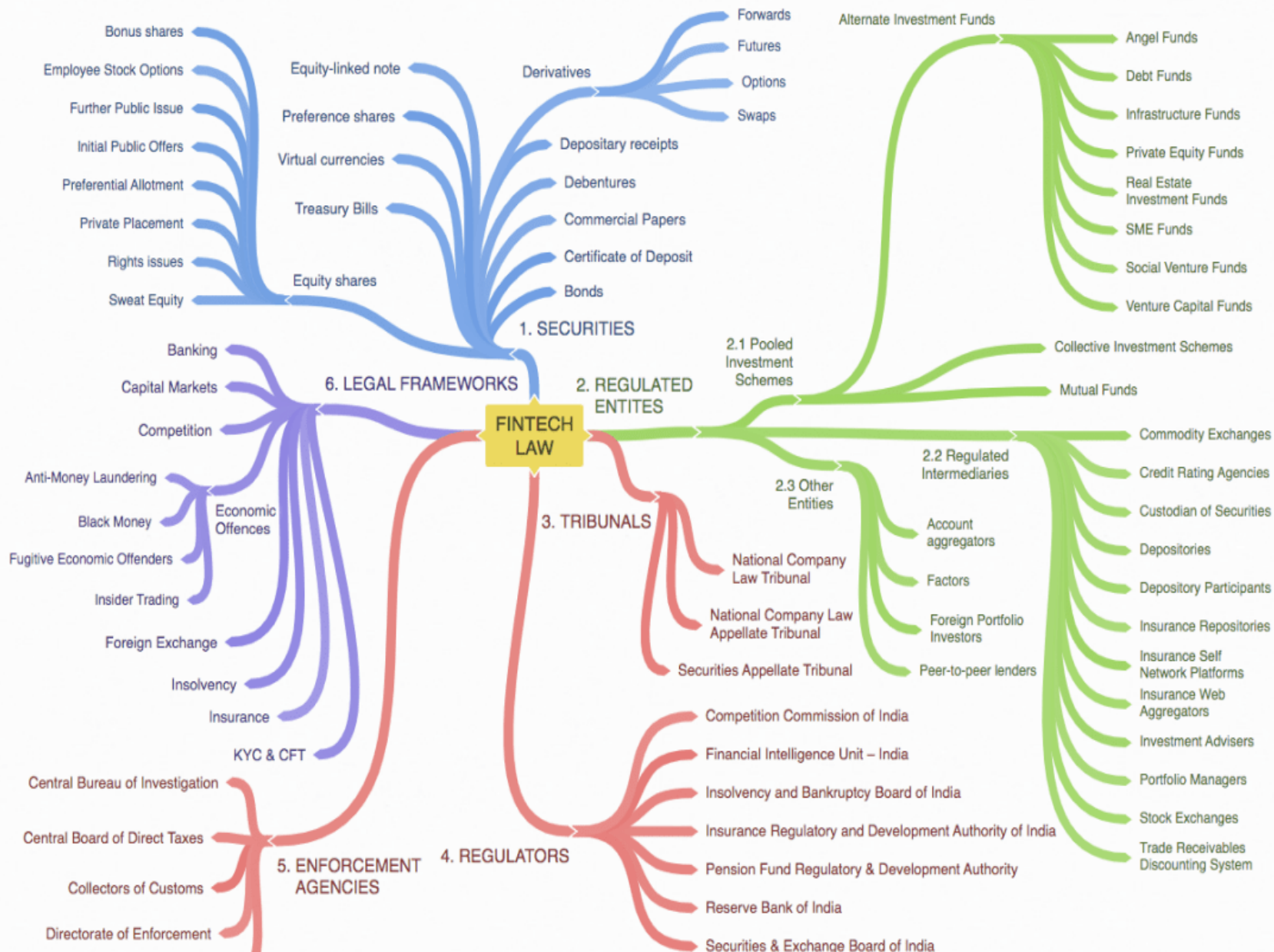
Data Security

- Cybercriminals perpetrating financial crimes
- Cybersecurity is the key to safeguarding consumer trust

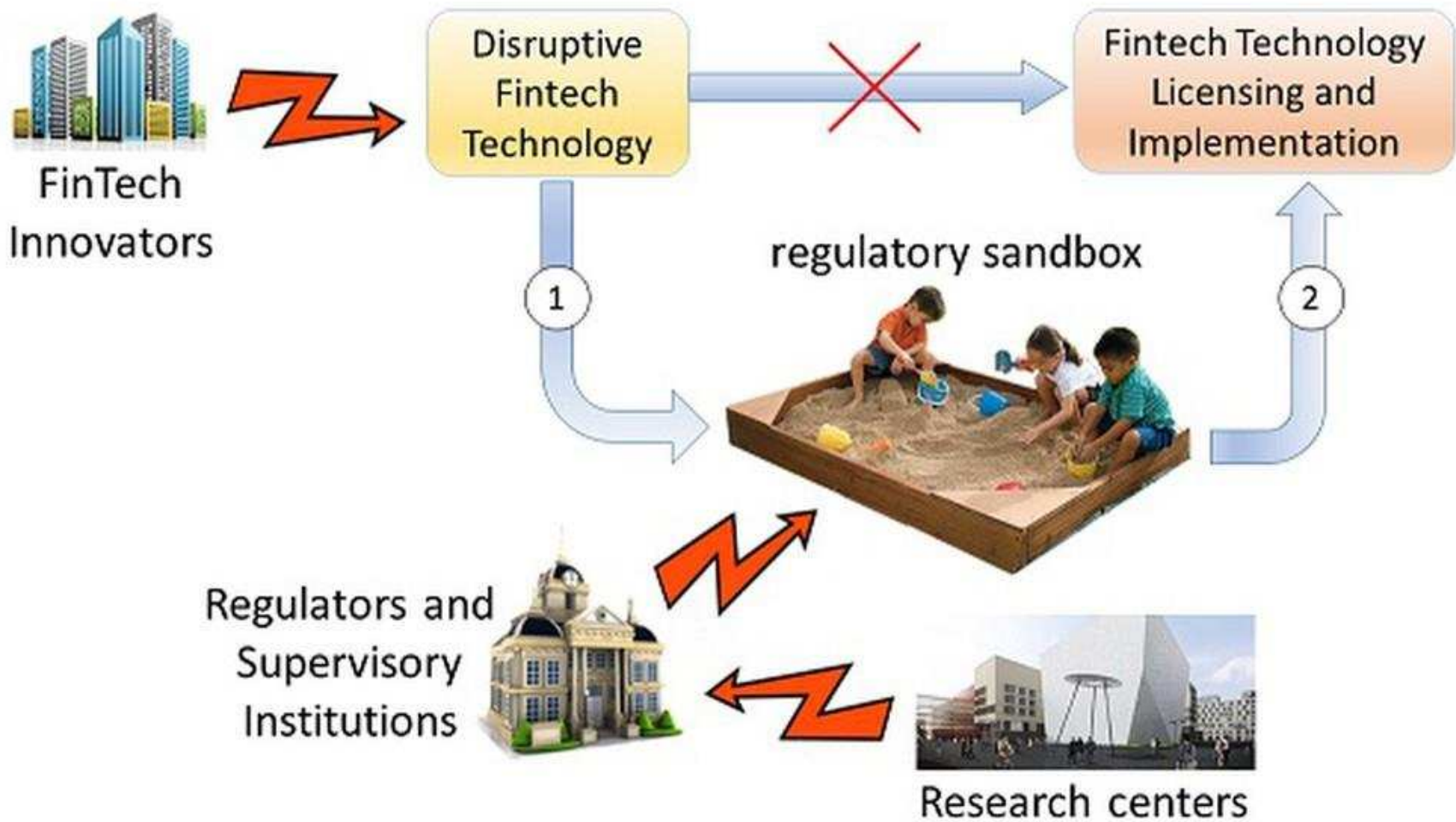
Open Data

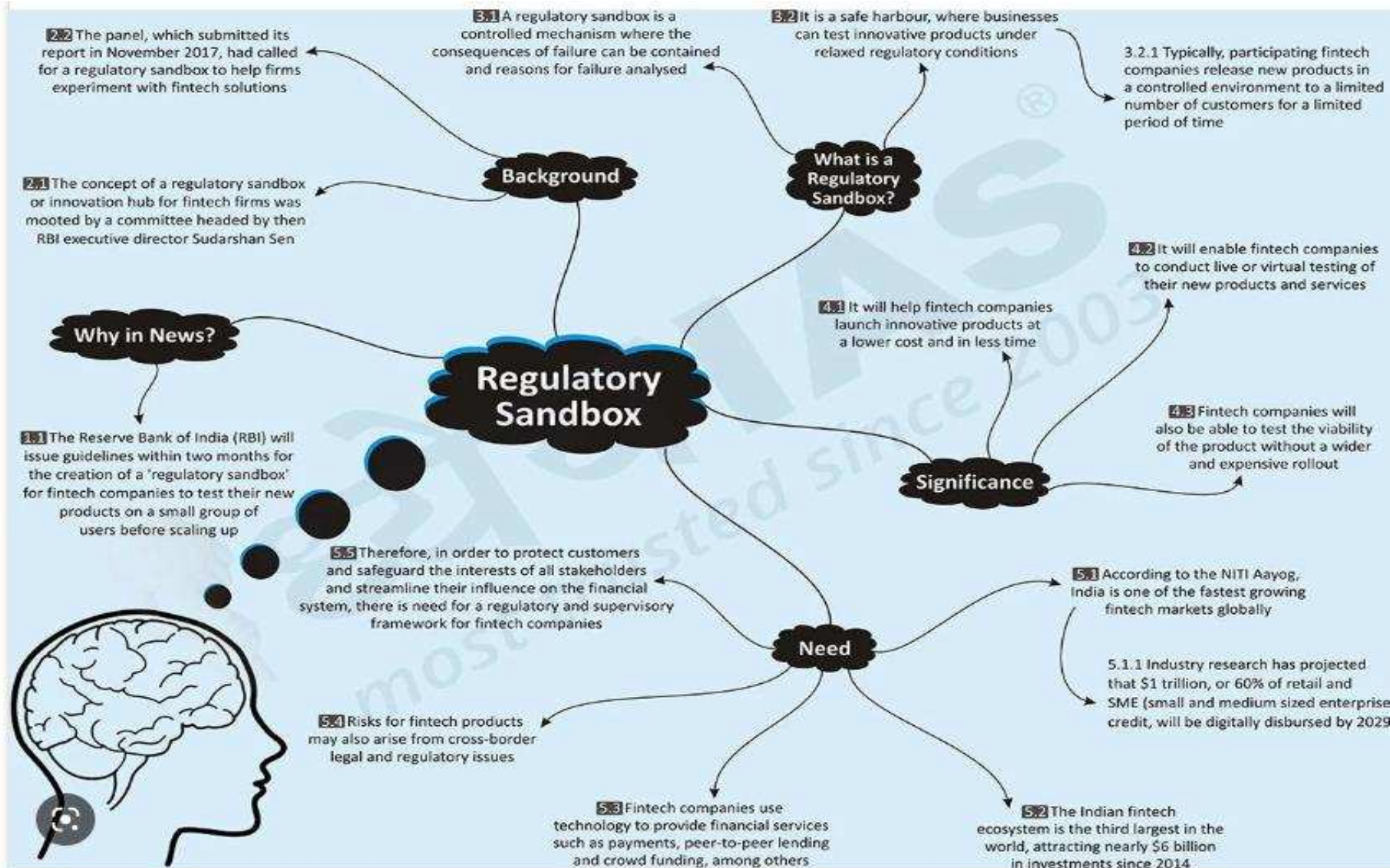
- Data is crucial for insight generation
- Restrictive policies could hamper free flow of data





SEBI WORKING REGULATORY SANBOX ON FINTECH





Regulations governing Lending FinTech's in India

No.	Segment	Regulatory Compliance	FDI Compliance
1.	Digital Lenders	Respective Master directions & circulars governing NBFC licensing and service in India	100% FDI allowed
2.	Peer to Peer Lenders (P2P)	Master Directions - Non-Banking Financial Company - Peer to Peer Lending Platform (Reserve Bank) Directions, 2017	100% FDI allowed
3.	Account Aggregator	Reserve Bank (NBFC - Account Aggregator) Direction, 2016	

Regulating Authority - Reserve Bank of India

RBI guidelines on the Data Localization Policy

- Reserve Bank of India (RBI) issued a circular dated April 6, 2018, stating that all authorized Payment System Operators (PSOs) in India to ensure that the data related to payment systems such as customer data, payment sensitive data, payment credentials, and transaction data should be mandatorily stored within India itself under the Payment and
- All payment firms, including American Express, Master Card/Visa, PayPal, Google Pay, WhatsApp Pay, Paytm, and Phone Pe, should adhere to the RBI's data localization rule. Subsequently, RBI insisted system providers for unfettered access to all data on complete end-to-end transaction details/information collected/carried/processed as part of the message/payment instruction by submitting Audit Report (SAR) conducted by CERT-IN. Settlement Systems Act, 2007.

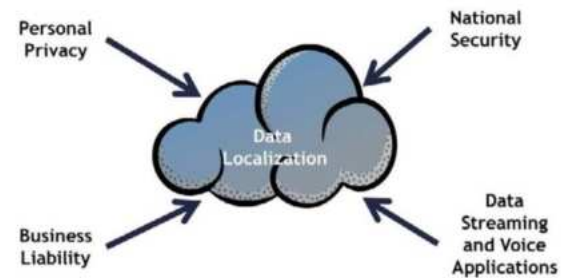


Indian Laws and Policies Enabling Data Localisation

Category of Data	Policy/ Law	No Restriction of Cross Border Flow	Cross Border Flow Permitted as Long as Copy Maintained in India	No Cross Border Flow Permitted
Critical Data	Personal Data Protection Bill, 2018			
Personal Data				
Personal Data Not Collected in India				
Public IoT Data	e-Commerce Policy			
E-Commerce Data				
Payment Systems Data	RBI Circular			
e-Pharmacy Data*	e-Pharmacy Regulations			
Subscriber and User Data	Unified Access License for Telecom			
Subscribers' Databases (Broadcasting Sector)	FDI Policy			
Companies' Account Related Data	Companies (Accounts) Rules, 2014			
Insurance Policy Holder Data	IRDAI Regulations			
Government Data	Guidelines on Contractual Terms Related to Cloud Services			

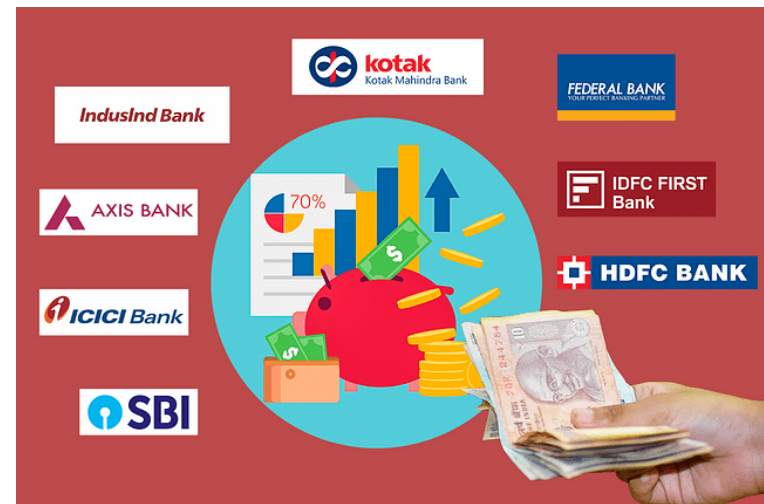
Latest position on data localization

- RBI reiterated its stand on data privacy by issuing a circular stating that from April 1, 2021, all Payment system operators to submit a compliance certificate duly signed by their CEOs or Managing Directors on a half-yearly basis adhering to the RBI's regulations on securing payments data.
- This again triggered an active interest in RBI's continuous intervention on securing and continuously monitoring the data to avoid any future risks to the country. With the advancements in the digital economy, financial data security is a must for the country's economic growth and development.



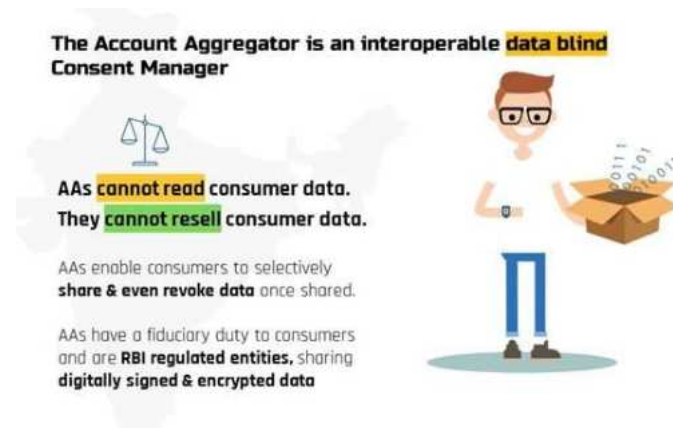
Future of Data Sharing:

→The consented data sharing under AA allows any third party app to securely receive users data which in turn gives rise to a range of new use cases. Imagine a Uber driver being able to get a loan through their rider app by sharing their bank account statement as opposed to walking to a bank. The possibilities are endless.

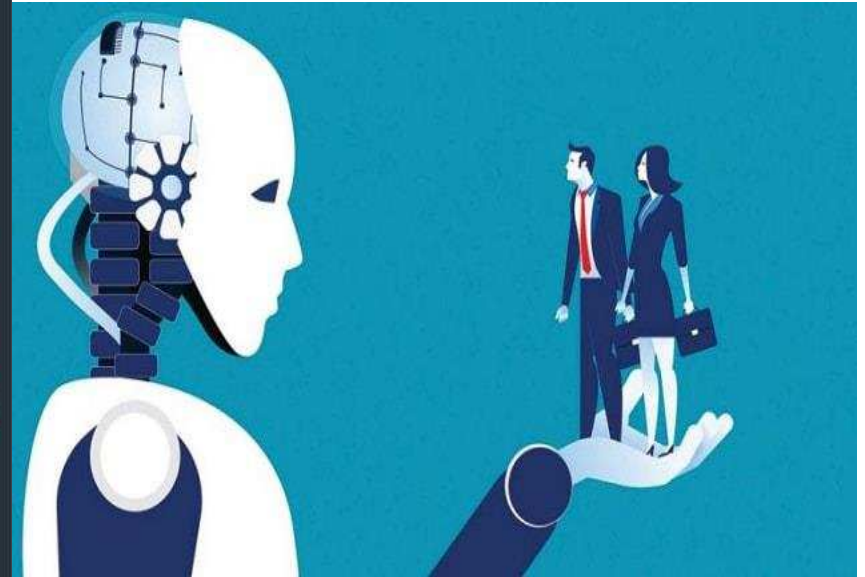
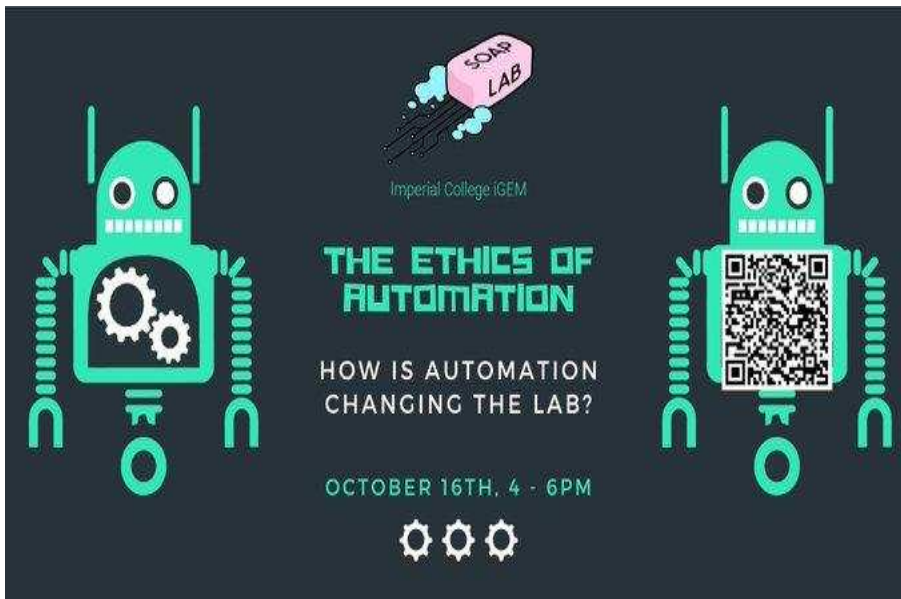


Can an AA see or store data?

- Data transmitted through the AA is encrypted.
- AAs are not allowed to store, process and sell the customer's data. No financial information accessed by the AA from an FIP should reside with the AA.
- It should not use the services of a third-party service provider for undertaking the business of account aggregation.
- User authentication credentials of customers relating to accounts with various FIPs shall not be accessed by the AA,







Law and Ethics in Automation



Law & Ethics in Automation

Artificial General Intelligence –

- ▶ The local, specific behavior of the AI may not be predictable apart from its safety, even if the programmers do everything right;
- ▶ Verifying the safety of the system becomes a greater challenge because we must verify what the system is trying to do, rather than being able to verify the system's safe behavior in all operating contexts;
- ▶ Ethical cognition itself must be taken as a subject matter of engineering



Machines with Moral Status

- ▶ **Sentience** - the capacity for phenomenal experience or qualia, such as the capacity to feel pain and suffer
- ▶ **Sapience** - a set of capacities associated with higher intelligence, such as self-awareness and being a reason-responsive agent
- ▶ **Principle of Substrate Non-Discrimination** - If two beings have the same functionality and the same conscious experience, and differ only in the substrate of their implementation, then they have the same moral status
- ▶ **Principle of Ontogeny Non-Discrimination** - If two beings have the same functionality and the same consciousness experience, and differ only in how they came into existence, then they have the same moral status

Types of Intelligence

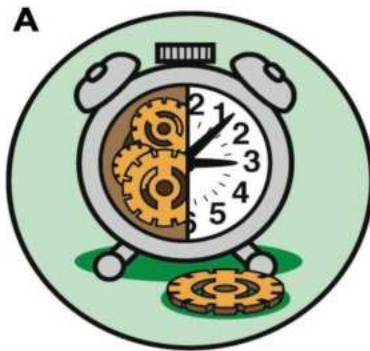
Sentient

The ability to feel, perceive things and having some consciousness.
E.g: Dog - Even though they can feel pain and emotions but lack the capacity for intelligence like humans do.

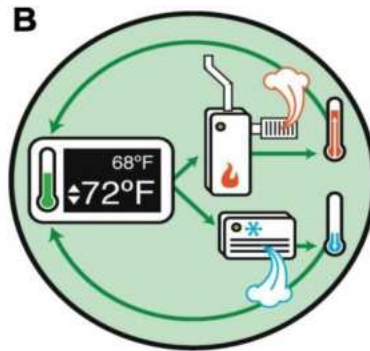
Sapient

Sapience means the ability to think, the capacity for intelligence, the ability to acquire wisdom.
E.g: Humans - From years of evolution they developed the ability to acquire knowledge and wisdom.

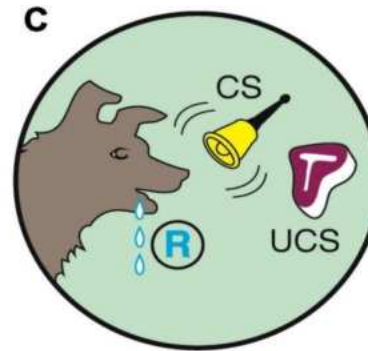




Hardware
modification only



Modify the data encoding
setpoint of goal-driven
process



Training by
rewards/
punishments



Communicate
cogent reasons



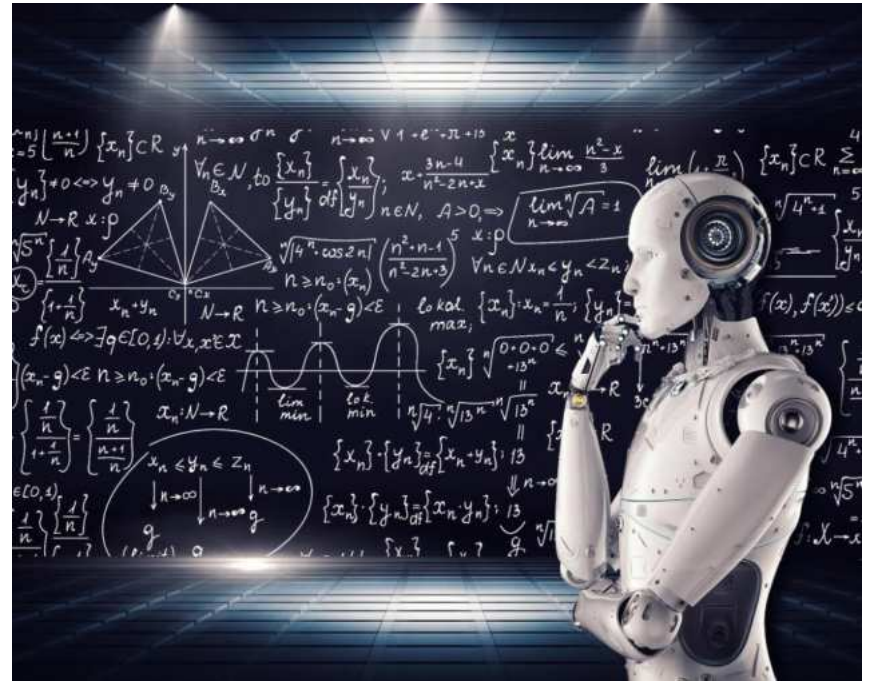
Minds with Exotic Properties

- ▶ **Principle of Subjective Rate of Time** - In cases where the duration of an experience is of basic normative significance, it is the experience's subjective duration that counts.
- ▶ *application of ethics*—and suggesting that this point is especially pertinent when one is considering the ethics of minds with exotic properties.



Super intelligence

- ▶ Yudkowsky (2008a) lists three families of metaphors for visualizing the capability of a smarter-than-human AI:
- ▶ Metaphors inspired by differences of individual intelligence between humans: AIs will patent new inventions, publish groundbreaking research papers, make money on the stock market, or lead political power blocks.
- ▶ Metaphors inspired by knowledge differences between past and present human civilizations: Fast AIs will invent capabilities that futurists commonly predict for human civilizations a century or millennium in the future, like molecular nanotechnology or interstellar travel.
- ▶ Metaphors inspired by differences of brain architecture between humans and other biological organisms: E.g., Vinge (1993): "Imagine running a dog mind at very high speed. Would a thousand years of doggy living add up to any human insight?"
- ▶ That is: Changes of cognitive architecture might produce insights that no human level mind would be able to find, or perhaps even represent, after any amount of time.



Privacy and Ethics

- ▶ sharper inequalities (e.g. digital gap),
- ▶ For instance, data-driven policies and surveillance can be tighten during emergencies and outlast, potentially reducing population rights.
- ▶ Ethics must address these issues and keep promoting individuals, collective well-being and cultural heterogeneity at the same time that faces global challenges.



Global Mis information(e.g. Deep Fakes)

- ▶ Deep learning is an AI technique that uses artificial neural networks to automatically generate a video that didn't happen.
- ▶ Deepfakes specifically refer to putting people into false situations or making them appear to say false quotes.
- ▶ While the technology appears to have first been used to transpose the faces of celebrities onto pornography, its reach has extended — and experts say it can be used for all sorts of things.
- ▶ That can take the form of politicians saying things they never said.



cognitive overflow, thought control (e.g. micro-targeting)

- ▶ Microtargeting is (also called micro-targeting or micro-niche targeting) is a marketing strategy that uses consumer data and demographics to identify the interests of specific individuals or very small groups of like-minded individuals and influence their thoughts or actions.
- ▶ An important goal of a microtargeting initiative is to know the target audience so well that messages get delivered through the target's preferred communication channel.



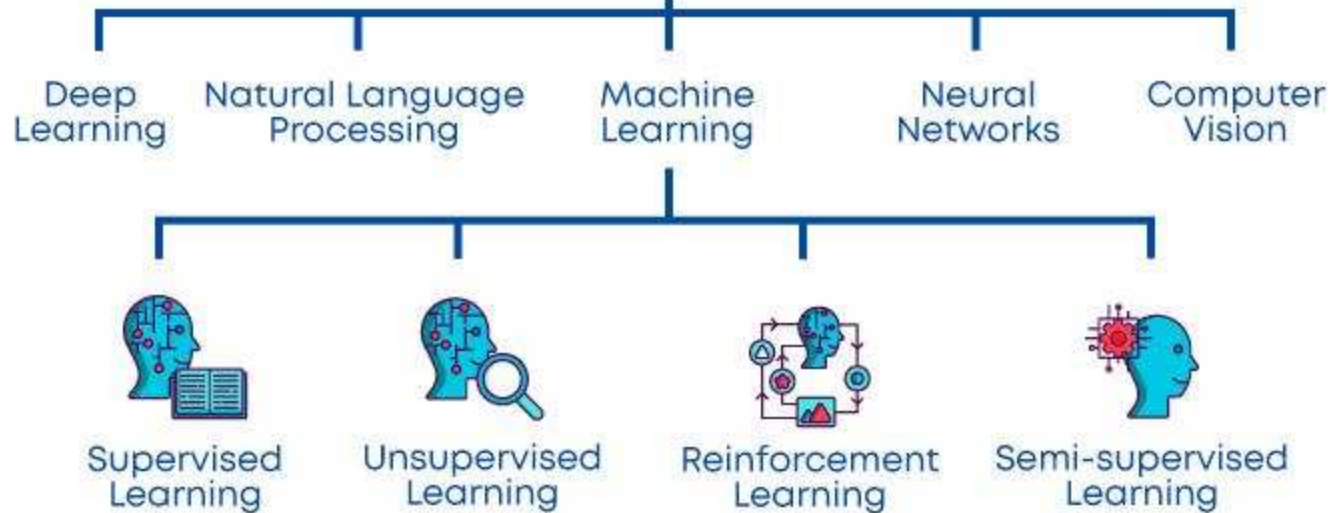
aggressive surveillance

- ▶ **Electronic surveillance** – Electronic surveillance equipment is often the most used tool during an investigation. It could range from cameras and wiretaps to GPS tracking and more. An employer may want to use GPS on company vehicles, for instance, to ensure they're being used professionally by employees. Electronics can record an array of information for investigators to document.
- ▶ **Technical surveillance** – Technical surveillance involves the use of audio and visual equipment to document behavior and conversations. This type of surveillance can come in handy during proof of cohabitation cases or employee sickness.



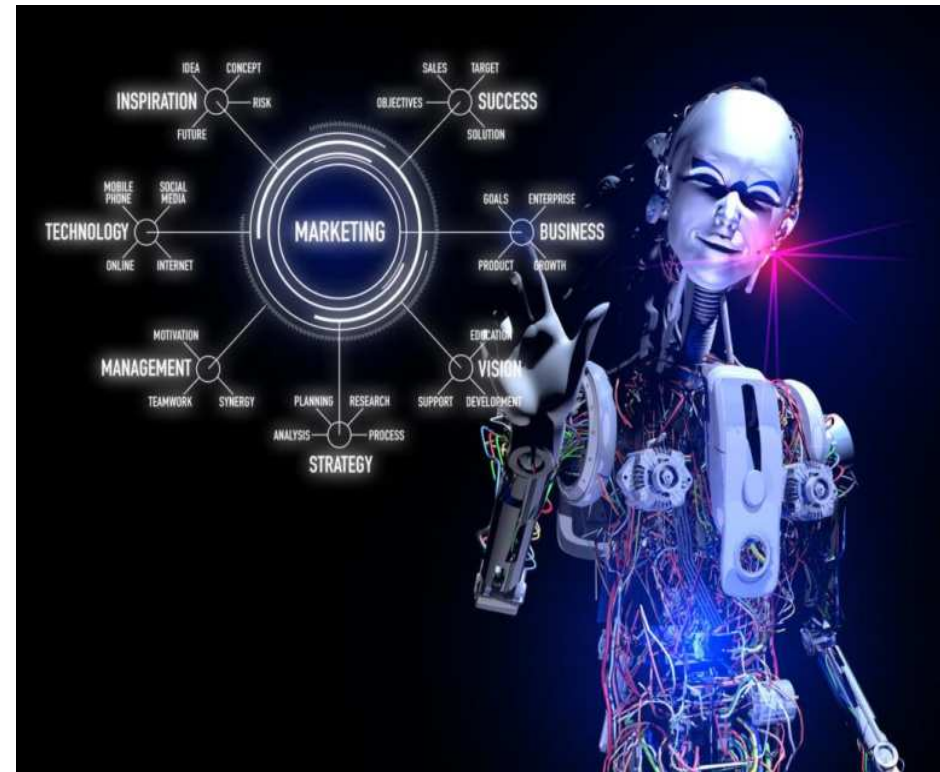


Artificial Intelligence



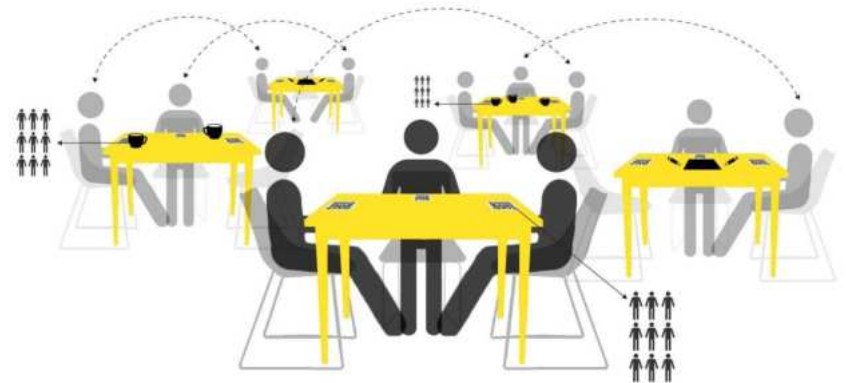
Big Ideas In Technology

- ▶ Bank of England Governor Mark Carney told The Times, 'Longer lives and rapid advances in technology could mean that some workers never have the option of retiring. We are clearly on the verge of a Fourth Industrial Revolution that would be dominated by artificial intelligence, automation, biotechnology and 3D printing.'



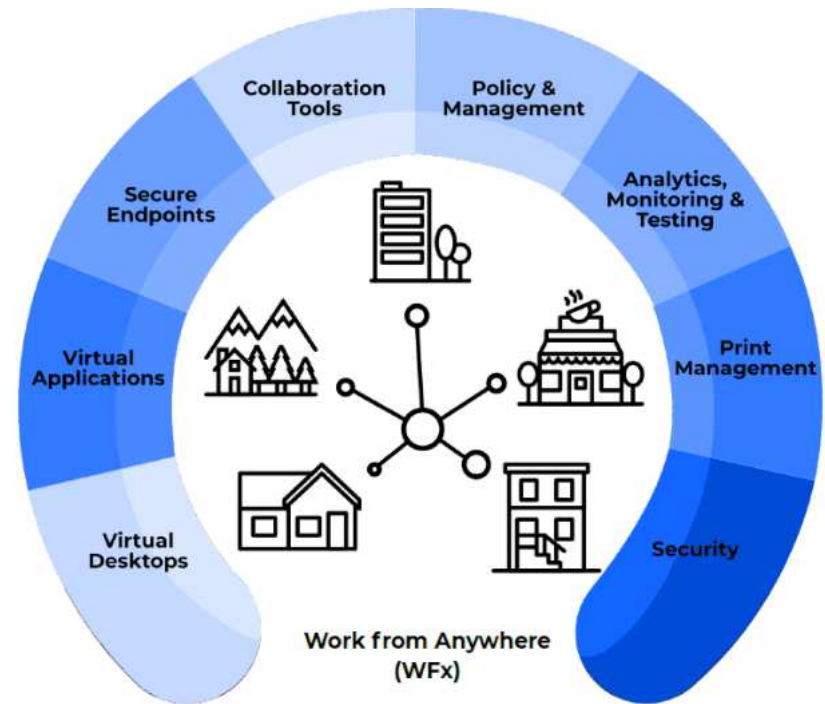
1. Physical Social Network

- ▶ The raison d'être of the 'place of work' is set to be more and more around interaction and less about solo work; buildings will become physical incarnations of online social networks. The experience of Gen Z today and their digital lifestyle informs much of what is to come. Their approach to real-time interaction through platforms such as Snapchat, WeChat and Fortnite demonstrate an expectation of being connected, always on, interacting synchronously and transparently with their friends. A gamified workplace will be one consequence of the 'Xbox generation' in stark contrast to the staccato exchange of asynchronous communications adopted by the Baby Boomers and Gen X, whose way of working is largely off-line in scripted workplaces, with days full of back-to-back meetings



2. A Digital Workplace

- ▶ The addiction of Gen Z to digital platforms will lead to an expectation for, and a realisation of, a digital workplace.
- ▶ This will have a range of attributes that will redefine how and where work is done. Today there is an ability for the user to choose but decisions and information are imperfect.
- ▶ And data scarcity leads to unintended consequences from ill-informed decisions – we are not optimising our work-life integration. With AI, machine learning and the use of data analytics to define an optimal working day, we will move from self-service to suggestion.
- ▶ Real-estate data scientists will analyse past performance, look at current activities, review the 'data lake' and recommend where to work, in what space and with which people.



3. Real Time Real Estate

- ▶ Suddenly buildings can become smart. Rather than the dumb containers of old, the rise of the internet of things will result in billions of sensors that will measure everything from air quality to occupancy and an intelligent infrastructure that will manage all aspects of the built environment.
- ▶ These systems will generate huge amounts of information, and this data will allow smart decisions.
- ▶ This vision of real time real estate cutting costs (energy, food waste, underutilised space) and improving experience (service, support) along with machine learning and AI (predictive analytics and sociometrics) will transform the world of work.



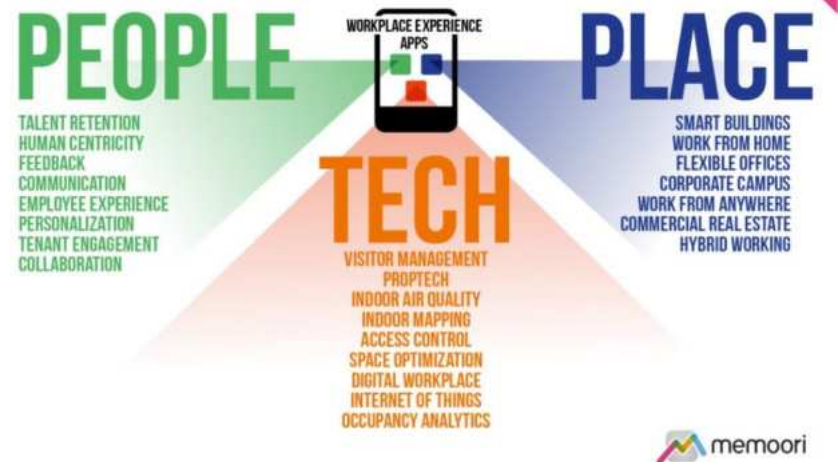
4. An App Centric Workplace

- ▶ We all use apps in our personal lives, but when we step into the workplace there is a lack of experience and utility. Much is about to change. We predict that many of the functions people need to be effective during their working day will be provisioned through an app. From accessing the building to finding the way to your meeting room, booking a desk or requesting a locker, ordering food and coffee or checking into a conference room, the app will be the dominant user interface. New workplace apps that are 'location aware' will change the user experience and provide enhanced productivity by aligning space with preference and activity.

FIG 1.1

Workplace Experience Apps

The Convergence of People, Place and Technology



5. A Consumerized Workplace

- ▶ The vision of apps on smart devices signifies the use of smart phones as a central tool. But people, and especially Gen Z, expect to use those devices for more than just corporate functionality. The blurring of boundaries between corporate apps and personal social media requires new approaches to 'work-life integration'. Progressive companies have resolved issues of security and compliance to allow people to 'bring their own device' (BYOD) to work and use it to access corporate systems. BYOD will blur the demarcations and complicate the once autocratic approach to corporate technology. Choice and preference will bring predictable and 'safe' corporate IT solutions into tension with a 'consumer-friendly' approach where people expect the same experience that they have with home technology.



6. The End of the Cable

- ▶ It seemed so implausible 25 years ago when I published The Cordless Office report.
- ▶ Back in 1994, people had never heard of wireless technology, or if they had, they were worried about speed, reliability and security.
- ▶ Now the cable is dead.
- ▶ People are used to wireless technology – indeed they rely on it; the iPad has no Ethernet port, a smart phone will synchronise with the cloud over Wifi and, soon, 5G wireless networks will provide blistering speed to the palm of your hand.
- ▶ The fears over performance and security are now largely gone and people have embraced the flexibility and mobility that wireless technology brings.
- ▶ Connecting people and not places or desks, using ever more portable devices and ‘unconscious synchronicity’ will become the new normal.



7. Voice Revolution

- ▶ We are at the beginning of a voice revolution. The use of speech to interact with technology is about to come of age. We have seen the growth of digital assistants like Apple's Siri and Microsoft's Cortana. Now the concept of the voice user interface or VUI will provide a new way of interacting with systems, platforms and devices. Natural language will increasingly be used to interact with digital assistants, requesting information, directing requests or searching for knowledge. Amazon's Alexa for Work is leading the way. As conversational computing arrives in the workplace, watch out for a backlash against open plan as noise and distraction drive people back into acoustically optimised spaces.
- ▶ Overlay voice with the rise of biometrics and cameras that capture intelligence through analytics of people's faces, their demeanour, their movement and behaviour – and we have a 'perfect storm' of new data to direct workplace experience. The ideas for tomorrow just got a lot closer.





Questions????

