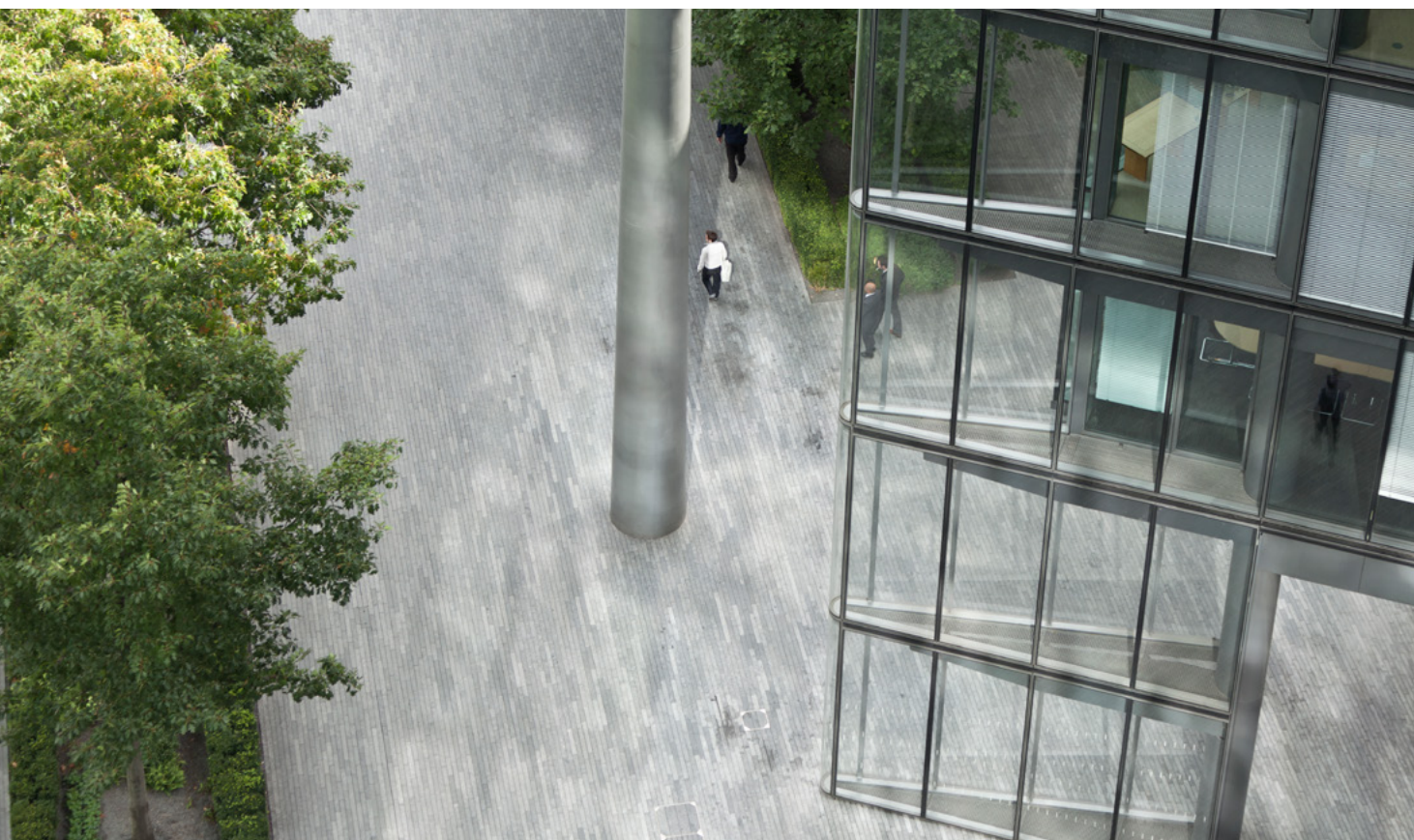




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City of London Corporation PwC Fintech series : India-UK Payments Landscape



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1

Executive summary



Objective of our research work

The UK witnessed a major Fintech revolution post the global financial crisis of 2008 and the City of London Corporation in particular evolved rapidly in embracing innovative technologies and establishing a mature Fintech eco-system. When it comes to Financial Services, London has always been the global financial hub and the Fintech growth in London is a natural extension of London's competitive edge. The world looks upon London in terms of best practice both from a Fintech business stand-point and the confidence the UK inspires through its robust regulatory regime that encourages innovation. Such innovative environment enables solutions like seamless payments within the UK and cross-border and at the same time keeps consumers at the heart of its business.

India on the other hand with a population of circa 1.3bn people is on the cusp of an explosive growth in the Fintech space since the past 3-4 years. This could be attributed to the current government initiative of 'Make in India' coupled with some major transformational steps undertaken such as introduction of Aadhar number which is the world's largest unique biometric system, the demonetization in November 2016 and the central Goods and Services tax (GST) act in mid-2017. All these steps were taken with a common goal to eliminate corruption and black money from the system. With a population of circa 300m people in the middle class and upper middle class income bracket across the 200 odd cities coupled with the fact that a major proportion of the population is young, the demand for innovative Fintech solutions across India is phenomenally high. This is further augmented by the introduction of Unified Payment Interface (UPI) that has been recognized as the most sophisticated public payments infrastructure in the world. UPI is an initiative by National Payments Corporation of India (NPCI), which is an umbrella organization (set under the initiative of the RBI and Indian Banks' Association) for all retail payments and settlement systems in India.

City of London Corporation – PwC Report Series:

Based on the Fintech round-table events organized in India over the past 12-18 months by the City of London Corporation representative office in Mumbai, there is an increasing appetite from both the UK and Indian Fintech players to consider in-bound and outbound investments to take advantage of the dynamic markets and the scale of opportunities offered by the UK (London in particular) and India. Particularly the UK Fintech players are keen to gain an understanding of the challenges faced by their Indian Fintech counterparts in the payment space and look to leverage their existing solutions to address these problems. The UK players view this as an opportunity to proactively engage with the Indian Fintech eco-system.

To foster deeper engagement between the UK and Indian Fintech sectors, the City of London Corporation has commissioned PwC India to develop three Fintech research reports around the governance, risk and compliance over Payments, Regtech and Insuretech during 2018-19.

The objective of undertaking this research is to create the required visibility over the opportunities and challenges within the Fintech eco-system in UK and India and how the opportunities in India and UK could be tapped in a seamless manner by UK Fintech firms, as well as Indian Fintechs planning international expansions in London/UK.





Opportunities in the Payments space

We have included below a snapshot of some of the achievements and opportunities along with potential challenges in the Payments space within India and UK including our perspective on best practices that the Fintech payments eco-system in India and UK could possibly look to follow:

Some of the key opportunities in the Indian Fintech payments space:

Government initiatives:

- A strong, proactive policy level support from the government has been providing a much-needed boost to user adoption of digital payments, for instance, Jan Dhan Yojana, Aadhar and the emergence of UPI
- There has been a 400 – 1,000% increase in digital transactions since the beginning of the demonetization in November 2016
- The growing appetite to leverage the Fintech capabilities between the UK and India is further strengthened by the Indian Prime Minister's visit to the UK in April 2018 where a number of Fintech initiatives were launched

Untapped potential

- The financial services market in India is largely untapped – 40% of the total population is currently not connected to banks (unbanked) and more than 80% of the payments in India are still made by cash.
- As per National Payments Corporation of India (NPCI) from April 2017 to March 2018, total financial transactions on NPCI's digital payment platforms with respect to retail payments were to the tune of INR 200bn and this is expected to grow up-to INR 1tn by 2023 that represents a whopping 400% increase over the next five years.
- By 2020, around 720 billion transactions are projected to occur through the use of digital payment methods in the Indian market which will be largely driven by development of UPI technology

A detailed description along with graphical analysis of all the potential opportunities is included in section 2.6 of this report.

Some of the key opportunities in the UK Fintech payments space:

UK as a Hub for Fintech:

- As per the UK FCA's (Financial Conduct Authority that focuses on conduct risks and regulation) Policy Statement PS 15/1, in 2015-16 the UK payment systems dealt with more than 21 billion transactions worth around £75 trillion which is circa USD 100tn.
- London's Fintech firms raised a record £2.45 billion which accounted for around 80 per cent of all UK venture capital tech funding in 2017
- 2017 saw a number of the world's leading tech companies pledge their long-term commitment to London, with significant investments from Amazon, Apple, Facebook and Google

Policy and Regulation

- Payment Services Directive (PSD2) will give rise to open banking across the UK and Europe requiring banks to become more and more customer centric. The phrase 'open banking' is used to describe the shift from a closed model to one in which data is shared between different members of the banking ecosystem with authorisation from the customer

Democratising the availability of financial products through Open Banking

- The introduction of open banking will result in democratizing the availability of all the financial products and services to the end customers at the best competitive price keeping customers need in the forefront.

A detailed description along with graphical analysis of all the potential opportunities is included in section 3.5 of this report





Potential challenges

Some of the potential challenges in the payments space in India

Technical integration

Weak technical integration is one of the challenges faced by the payment firms. There is a lack of interface between the processing systems which lead to processing and payment delays, increased fees and lost transactions. The lack of improved technology leads to firms' inability to handle huge traffic when new products are introduced.

Cyber security issues

Whilst cyber security threat is prevalent across the globe across the developed capital markets like the UK, US, Singapore etc., in a rapidly emerging Fintech Payments market like India, this threat is all the more pertinent considering the size of the payments market and the fact that India is one of the most vulnerable countries in the world that is prone to cyber-attacks.

Safety Concerns

Increasingly, people are concerned about the safety of the information submitted to the payment firms. There appears to be a negative image which is formed regarding the information security and tracking of shopping habits of customers using digital payment platforms.

A detailed description of all the potential challenges is included in section 2.6 of this report.

Some of the potential challenges in the payment space in the UK:

Regulation

High cost of compliance with the newly introduced Payment Service Directive (PSD2 effective from 13 January 2018) in terms of implementing the requirements of this regulation

Competition

Stiff competition for new overseas Fintech Payment firms into the London Fintech market that is already matured and saturated coupled with the high establishment costs in London.

Barriers to entry

Lack of adequate preparation by new Fintech players to address the firm authorization requirements from the UK FCA and subsequently the PSR (Payment Services Regulator).

A detailed description of all the potential challenges is included in section 3.5 of this report.





Our perspectives

Our perspectives on how best to move forward:

UK banks and payment firms:

- Banks and Fintech payment firms in the UK should ensure their top management is part of developing a strategic response to open banking. Currently, strategic considerations are often a byproduct of a PSD2 compliance project managed by IT and operations.
- Payment firms can begin to identify new revenue opportunities for services, such as AISPs (Account Information Service Providers), PISPs (Payment Initiation Service Providers), and CISPs (Card-based Payments Instruments Issuers), and consider new business models.

UK and Indian payment firms

- Cyber security is paramount to rebuilding this trust – winners will have invested significantly in this area. Recent high-profile security breaches and media commentary surrounding cyber-attacks have generated fear and uncertainty, further eroding stakeholder trust. This is where the UK's reputation as a leader in cyber security and India's expertise in software development could be leveraged to effectively mitigate this risk.

- From our work with leading Fintech players within India and the UK and based on our research into the macro-trends impacting banking and Fintech firms and from our survey of global banking executives, we have identified the following six priorities for retail payment firms to win in 2020:

- **Developing a customer-centric business model:** Payment Banks today may have a simplistic understanding of their customers and a vastly complex product set. The winners of 2020 will turn this on its head. They will develop a much more complete understanding of their customers and dramatically simplify their product set, and so deliver a significantly enhanced customer experience with lower levels of operational risk.
- **Optimising distribution:** Distribution is ripe for digital disruption. Historically, banks with the best branch footprint have dominated their markets, gaining outsized share. By 2020, all banks will be direct banks, and branch banking will be changing fast. Leaders will offer an anytime, anywhere service, fully utilising all banking channels in an integrated fashion.
- **Simplifying business and operating models:** Banks have developed staggeringly complex and costly business and operating models. Rising customer expectations, increasingly active regulators and stagnant shareholder returns warrants simplification of business models to deliver an improved customer experience, structurally lower cost and reduced levels of operational risk. London based Fintech firm Dopay could serve as an example of how best to simply business and operating models. Dopay is a fintech startup that provides a cloud-based payroll service that allows employers to calculate salaries and make payments electronically. It breaks the cash cycle by offering a payroll and cash management service for companies. Employees receive a DoPay card and DoPay app, which give them a full banking experience.



- **Obtaining an information advantage:** Getting this right will be a game changer. Fast movers will create competitive advantage in every area of the bank – customer experience, underwriting and pricing, operations, risk management and financial/ cost management. Few banks and payment firms will be able to master the skills to integrate, analyse and act upon the insights from the ever increasing mass of data.
- **Enabling innovation**, and the capabilities required to foster it. Innovation is the single most important factor driving sustainable top- and bottom-line growth in banking. But banks today are not known as places where innovation thrives, nor are they the favoured destination for top software engineers and other innovators.
- **Proactively managing risk, regulations and capital:** The post-crisis flood of regulations signals a major mindset change for regulators. In the past, regulation was just one of many considerations. Capital was plentiful and not a significant business constraint. Conduct issues were thought to be few and far between. Today, not only are the rules much more complex, but regulators are more suspicious, and less flexible in their demands to improve compliance, reporting, and the underlying business processes and data.

Indian Fintech payment firms

- Where weak technical integration is one of the challenges faced by Indian payment firms, they could look to possibly leverage upon some established UK payment platform firms like Currencycloud that offers a cloud based platform which allows businesses to manage their flow of funds and makes payments frictionless.
- To mitigate the ever increasing threat of cyber-attacks across the Fintech platform firms, some of the solutions offered by leading Fintech firms in the UK (London) like Ravelin could be leveraged upon. Ravelin is an award-winning fraud detection and prevention platform firm for online merchants and the payments industry. It uses a combination of machine learning, graph networks and human insights to detect fraud before the sale happens, saving merchants millions in chargebacks, lost customers and reputational damage
- In-order to prevent un-authorised access to personal data of consumers that is submitted to payment firms, some of the leading biometric authentication solutions available for consumers in the UK such as AimBrain which is a London based Fintech firm could be possibly considered.

AimBrain is a BIDaaS (biometric identity as-a-service) platform providing Cloud-based biometric authentication (voice, facial & behavioral). AimBrain's approach to BIDaaS uniquely combines voice, facial and behavioral biometrics with cloud-based authentication to verify an identity, unlike traditional implementations of PINs, tokens and even fingerprints that simply confirm the link between the individual and the device.

Indian Regulatory and policy landscape around Fintech payments

- Regulations need not to be ownership-driven and could provide suitable regulations for all instruments. Mobile wallet companies are important and active contributors to the payments ecosystem in India. However, there appears to be disparities in the regulations on PPIs (prepaid instruments)/wallets for banks and non-banks in India. Banks can operate open wallets that allow cash-out facilities for customers to use interoperable payments systems. Non-banks, on the other hand, can operate only a semi-closed wallet which does not allow cash-outs.

Allowing ubiquitous usage of all payment instruments through interoperability will create multiple avenues for new and conventional players to disrupt the market and ensure interaction between different instruments and services, creating multiple use cases.

- Regulations need to be activity-dependent and not value-dependent. PPIs provide a low-friction payment experience which incentivises customers to adopt digital payments. However, the proposed PPI regulations require customers to go through additional factors of authentication. The regulations have also proposed that for online retail, PPIs have separate logins for the main PPI app through additional authentication steps. This will create friction in the payments experience and prevent customers from using digital means for making small-value payments.

To drive digital payments, the government has to bring low-value high-volume transactions into the ambit of 'digital'. The need of the hour is to drive payments based on activity. As retail payments comprise the largest chunk of payments, they have a higher chance of getting digitised if the explicit cost associated with small-value payments is removed or reduced.

- Regulations to be based on a reasonable cost benefit analysis (CBA). For wallets to be successful in driving digital payments and financial inclusion in India, it is imperative that they are commercially viable. Presently, wallets do not earn equitable revenue from the money kept in escrow accounts of banks. Additionally, the proposed new PPI guidelines prescribe a number of operational processes which will stifle the functionality of wallets and add to their operational costs.

For example, the new draft guidelines require minimum KYC accounts to be converted to full KYC accounts within 60 days of opening of the PPI account. Aadhar-based full KYC will be a challenge given that a large number of Aadhar accounts are not linked to a mobile number or are linked to an incorrect mobile number (some estimates suggest this to be 40%). Perhaps this is an area where UK Fintech players like Onfido who have recently established their presence in India as an AI (artificial intelligence) powered identity verification Company can work towards providing a quick and seamless identification process that in turn will reduce the processing time for the full KYC.

The UK FCA uses a detailed CBA for regulatory impact analysis around the operation of e-wallet payments. It encourages decision makers and all relevant stakeholders to take account of all the positive and negative effects of proposed regulations, and helps identify cost-effective solutions to problems by identifying and measuring all costs.

- Regulator and the Fintech industry to collaborate on skill development in cyber security. Established security protocols, policies and certificates play a major role in setting cyber security standards. However, in the current IT ecosystem, essential standards and benchmarks are either unavailable or are not implementable to test the systems because they have not been standardised. IT policies are dependent on the proactivity of the player rather than on established standards in the industry. These infrastructure and process gaps are exacerbated by the dearth of professionals trained in skills of IT security and risk mitigation.

Standardisation of skills and certifications for ‘man behind the machine’ is critical for IT security and risk mitigation. PPPs (Public Private Partnerships) will be of immense value in this area to provide curriculum and certifications for new-age, technology-led payments players. They should incorporate global best practices as well as global standards. This initiative will help the industry create safeguards and foster trust.

As an action point, the regulators along with specific independent stakeholders from the industry need to create a body to set standards, provide certification and create e-learning courses on IT security and risk mitigation. This body can comprise government and payment providers such as NITI Aayog, the Ministry of Finance, Ministry of Electronics and Information Technology, RBI, NPCI and other payment networks, payment gateways and payment technology players.

The British Government had worked with leading industry partners to develop e-learning courses to understand online threats and how to protect business data, money and reputation. A course was developed with the Law Society and the ICAEW to increase the knowledge base of cyber security for legal and accountancy professionals.

- Regulator and judiciary to create e-courts for online dispute resolution. Innovation in technology is the key driver and disrupter for digital payments. The world of online transactions and virtual interfaces works at an astonishing pace and is complicated. Likewise, frauds and security breaches are perpetrated at a fast pace. The conventional judiciary systems are not adept at resolving such issues. A slow judiciary and law enforcement process implies a higher cost and increased time for investigation and dispute resolution. Swift adjudication is critical to maintain customer trust in digital payments and also reduce potential financial loss that can be incurred due to delays in processes. Real-time risk monitoring can help the judiciary and law enforcement institutions to work in the present rather than in retrospect.





Conclusion

Considering the rapidly growing Fintech payments market in India with the adoption of leading payment interfaces like the UPI and the growth of the payments sector in the UK that is further augmented with the introduction of Open banking and PSD2, there will be a plethora of opportunities for both the UK Fintech players and their Indian counterparts to participate in the rapidly growing payments market in both these geographies.

The key messages for both the UK Fintech and the Indian Fintech Payment players will be:

- There appears to be a need for UK Fintech players to gain a better understanding and visibility over the opportunities and challenges faced by the Indian Fintech players in the payments space
- The UK Fintech players can then look to establish a road-map on how these challenges could be addressed by them by leveraging their leading practices in the UK Fintech eco-system.

- Similarly the growing importance of Open banking across UK and Europe is set to democratize the availability of financial products and services to customers without any challenges on hoarding customer data by any major retail bank.
- The scope of opportunities and growth for Indian Fintech players is limitless provided they undertake a detailed assessment of the Fintech eco-system in the UK and identify areas where they could create a niche for themselves in such a major financial services market.

It will be useful for the UK Fintech players to gain a better understanding and visibility over the challenges faced by the Indian Fintech players in the payments space and establish a road-map on how these challenges could be addressed by them.





2

The Fintech story in India so far

This section focusses on the growth of the Fintech eco-system in India post the liberalization of the Indian economy in 1990 and how the digital payments landscape have evolved over the past 5-7 years including the opportunities and challenges faced by this industry and the regulatory themes relevant for such Fintech Payment firms



Introduction

Mobile money services have proven to be an effective gateway for financial inclusion among the unbanked- a demography that could potentially evolve into a multi-billion dollar payments opportunity in India from a size and volume perspective given the mobile phone and more particularly the smart-phone penetration captures the substantial part of the Indian population. The bankers or wealth managers in future will provide advice to take appropriate financial

decisions based on a combination of artificial intelligence (AI) and transactional and contextual data. Customer grievances and cost is expected to decrease as new business models and emerging technologies are being adopted to streamline the on-boarding processes, procedures, operations and client communication. The influence that FinTech has on the payment market is rapidly growing and the long-term potential is even greater.



Evolution of Fintech in India

The Indian government began the process of liberalizing its banking industry post-**1990** by introducing technology-savvy banks. The government undertook legislative actions to boost the banking system and pushed new technology such as MICR (magnetic ink character recognition), electronic funds transfer and other electronic payments that revolutionized the banking system and helped boost the Indian economy.

However, for the past two decades since **1991**, the technological innovation in financial services and banking were government-driven and witnessed a relatively slow growth. The Indian banking and financial industry witnessed the penetration of Fintech startups in the retail consumer segment

from the mid-2000 onwards. One of the initial offerings that was introduced in 2005, was the Banking Correspondent (BC) model, which was used to increase penetration of financial services to the rural household. BC is a representative authorized to offer services such as cash transactions where the lender does not have a branch. Primary role of BC is to oversee the proper development and functioning of indirect banking channels. BCs offered a low cost alternative to setting up branches for financial institutions (FIs) to serve the rural population. FinoPayTech and Eko India were one of the major initial startups that had built their services around the BC model.

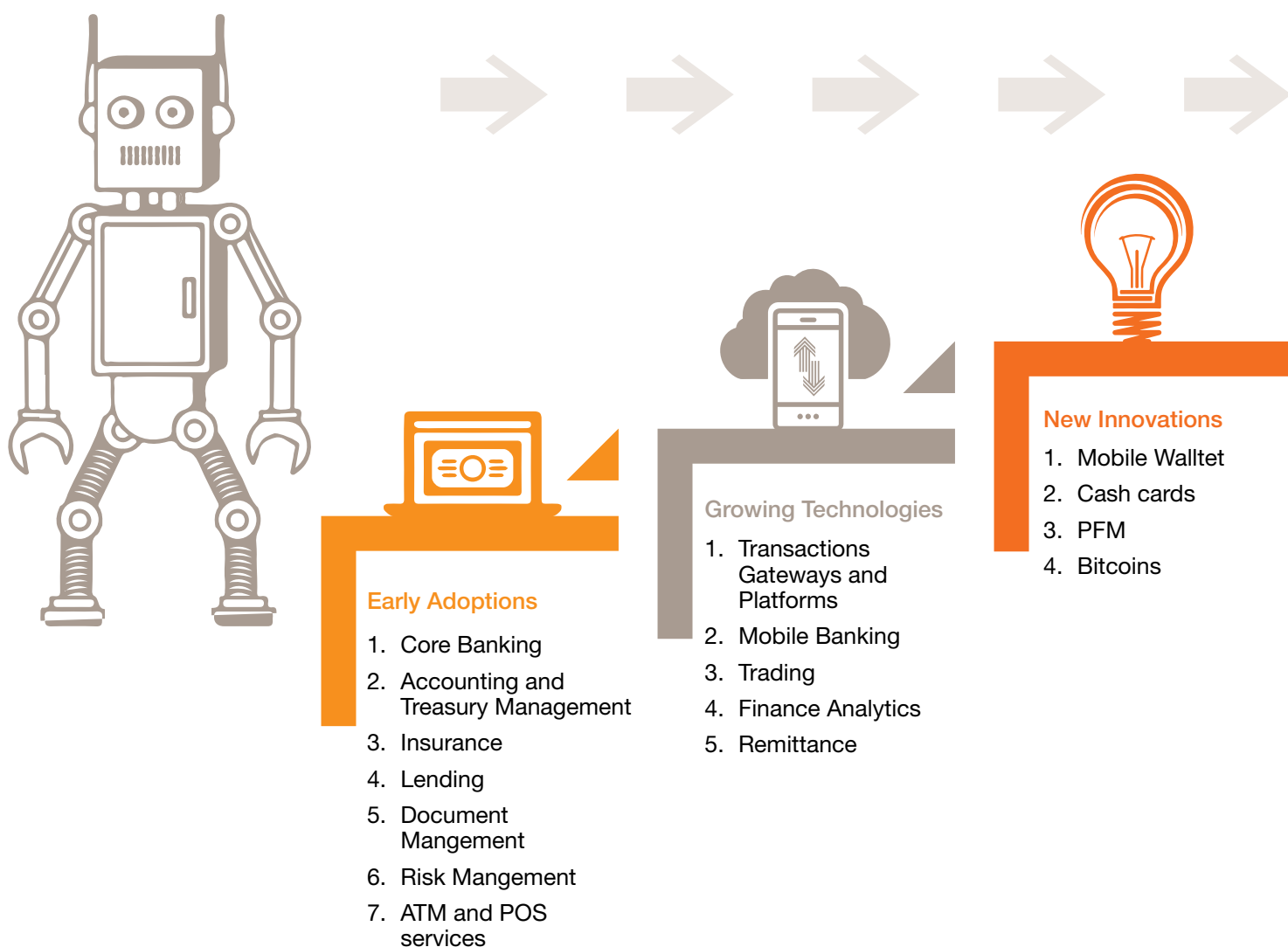
2010 saw an emergence of payment startups in mobile wallets; e-bill payments and mobile recharge services. Major Fintech startups such as Oxigen, MobiKwik, Paytm and Freecharge originated between **2005–10**. From **2010**, there have been multiple Fintech startups that have mushroomed in different segments such as lending (**100+** startups), personal finance management (**40+** startups) and investment management (**90+** startups). The regulatory bodies and banks have developed and introduced new solutions which will create interesting opportunities for Fintech.

A number of strategic partnerships took place between Banks and Fintech players due to the following:

- Introduction of contactless mobile payment system
- 'Invoice to Payment' feature that provide end-to-end digital invoicing and payment solutions
- Allowing customers to open accounts digitally with their PAN (Permanent Account Number) card and Aadhaar card

These solutions enable Fintech startups to leverage the infrastructure created by banks to apply their solutions or enhance existing offerings with superior product experience.

Roadmap of Indian Fin Tech Evolution





Strong Governmental Support for Fintech in India

A government push for financial inclusion, digitization and startup activity has led to the introduction of policy initiatives which provide a strong foundation to the FinTech sector in India

India Stack

The government has provided one of the world-class technological framework to entrepreneurs, innovators and corporations, allowing for the accelerated and rapid growth of FinTech ventures. The scenario resembles the policy support offered by the government to the telecom industry in the 90's, with FinTech taking center stage in many reform initiatives

Startup India Program

The Startup India program, launched by the central government, includes the simplification of regulatory processes, tax exemptions, patent reforms, mentorship opportunities and increased government funding. As per the Startup India Status Report as on 4th January 2018, Startup India hub has been able to handle more than 77,000 queries and facilitate more than 450 Startups by providing advisory on business plans, pitching support, etc.

Jan Dhan Yojana

Financial inclusion in the country has grown significantly due to initiatives like the Pradhan Mantri Jan Dhan Yojana (PMJDY), regarded as the world's biggest financial inclusion program, with an aim to facilitate the creation of bank accounts for large underserved or unserved sections of India's billion plus population. As per the progress report issued by Pradhan Mantri Jan - Dhan Yojana, the number of RuPay Debit Cards issued to beneficiaries was 24.02 crores and the number of total beneficiaries are 318 million (as on 27th June 2018). Keeping in mind the economic status of people below poverty line, PMJDY aims to make available certain basic financial transactions via ordinary mobile phones and not smart phones. This ensures that even people from rural areas and those from the unorganized sector have access to quick and convenient banking and payment options. The feature provides scope for innovation as much as possible to ensure financial inclusion as well as financial security to as many Indians.

Aadhaar Adoption

The RBI approved Aadhaar based biometric authentication, which allows bank accounts to be opened through e-KYC at any Banking Correspondent (BC) location. This allows financial services companies to do e-KYC checks more economically, thereby reducing transaction costs for customers. As per the 'The Report of the Committee on Financial Inclusion', the technology has to enable the banks to go where the customer is present, instead of the other way around and technology should allow interoperability among different systems adopted by different banks. The Aadhaar Payment System is intended to address both the requirements. As per the State Aadhaar Report 2017-18, 1.2 billion residents currently enrolled on Aadhaar platform with over 90% adult saturation in most Indian states. There has been marked increase in e-KYC verifications from 48 million to 138 million from FY 2016-17 to 2017-18 as per the NPCI 2018 report.

National Payments Council of India Initiatives

The NPCI through the introduction of UPI has leveraged the growing presence of mobile phones as acquiring devices, substantially reducing the cost of infrastructure for FinTech ventures. With the smartphone user base expected to expand to about 500 million users by 2020, the digital banking footprint is projected to grow faster than ever before. The NPCI has also introduced several innovative products, such as RuPay cards, which allows for immediate money transfers and a more convenient experience for the customer.



What makes Fintech unique in India

Fintech has been thriving in India for the last 5 years due to a combination of macro-economic factors such as demonetisation as noted in the overview section one and the need to create digital solutions to improve efficiency over various processes that were historically handled with manual intervention. However, unlike the developed markets in Europe and North America, India's recent emergence as an economic powerhouse renders comparisons to these markets more difficult. Fintech in India is unique because it is growing rapidly, is young, and is fueled by a large market base and an enormous list of challenges faced along with the opportunities it creates. With internet penetration and mobile usage increasing rapidly, India proves to be an attractive market for technology startups. The financial services market in India is largely untapped – 40% of the total population is currently not connected to banks (unbanked) and more than 80% of the payments in India are still made by cash. This untapped Indian Fintech market provides a massive opportunity to significantly increase demand in almost every category – digital payments, consumer lending, insurance, trade finance etc. In each of these areas, new Fintech solutions are directly influencing the market to grow significantly.

India holds a lot of promise in the Fintech space as it provides the right mix of technical skills, government support, regulatory policies and the business environment for startups to flourish. Some of the key characteristics of the Indian market that makes it exciting and interesting for Fintech startups are:

- India is the only Fintech hub that provides ample opportunities to target large unbanked population. Coupled with the growing young population which is readily accepting new technologies, India serves to be an attractive destination for Fintech startups.
- The challenging exercise to change consumer behavior towards accepting Fintech solutions is already underway and is making considerable progress. This is evident by the use of Fintech payment solutions such as Paytm, Rupay, BHIM etc. by relatively low income users such as taxi drivers, maids, factory workers etc.

- The focus on technical education as part of the education curriculum provides India with a strong talent pipeline at a comparatively cost efficient and easy-to-hire tech workforce.
- India has the second biggest startup ecosystem in APAC after China measured in deal size and number of deals.

Overall, India is confidently moving up the Fintech ladder and provides plenty of opportunities for Fintech startups to enter the diversified payments market and be successful.

According to the 'FinTech Trends Report India 2017 by PwC', the most promising FinTech opportunities identified in India include leveraging existing data and analytics and improvement of customer retention. The opportunities in these areas are much higher in India as compared to the available opportunities globally.

With internet penetration and mobile usage increasing rapidly, India proves to be an attractive market for technology startups. The financial services market in India is largely untapped – 40% of the total population is currently not connected to banks (unbanked) and more than 80% of the payments in India are still made by cash. This untapped Indian Fintech market provides a massive opportunity to significantly increase demand in almost every category – digital payments, consumer lending, insurance, trade finance etc





The digital payments journey in India

Payments have evolved significantly since its inception, from the barter system to the exchange of coins and currency notes, to bank accounts and checks and over the recent years to cashless payments through credit cards and e-wallets. The payments industry has witnessed a transformational phase both globally and within India. The pace of change in the payments industry is rapidly evolving in response to the growing consumer needs for a seamless payment facility at the press of a button. The technological advancements in the digital payment ecosystem are changing our lives significantly and providing the end consumers with speed, convenience, choice and savings.

Demonetisation impact:

The digital India mission envisioned by the Government of India is aimed at transforming the country into a digital economy. One major part of this larger program is a special focus on digital payments. The last two years have been revolutionary for the digital payment industry in India on account of the demonetization drive in 2016. India had always been a pro-cash economy with easy access to cash, and so in the pre-demonetization phase there was resistance towards digital payments but demonetization broke into such resistance. The entire payments ecosystem experienced a much needed paradigm-shift towards digital payments to such an extent that digital payments were adopted as a necessity even by the fruits and vegetables vendors on the streets across the Indian cities.

The world's largest demonetisation exercise was exercised on 8 November, 2016 and all Rs 500 and Rs1, 000 notes were abruptly withdrawn in a bid against black money, terror funding, corruption and fake currency proliferation. In search for a new alternative to replace cash, Indian citizens turned to digital transactions, which witnessed a 400 – 1,000% increase since the beginning of the demonetisation. Since the introduction of a cashless ecosystem, there have been numerous regulatory reforms that augmented rapid digital development in the payments space.

In an attempt to find new alternative to replace cash, Indian citizens turned to digital transactions post 8 November 2016 when the world's largest demonetization exercise was announced in India. As a result the digital payments witnessed a whopping 400-1000% increase in volumes since the beginning of demonetization.

UPI (Unified Payment Interface):

The NPCI unveiled a new payment system called UPI (Unified Payment Interface) during the same period when Demonetisation took place. UPI is an instant payment system developed by the NPCI and is built over the IMPS (Immediate Payment Service) infrastructure and allows users to instantly transfer money between any two parties' bank accounts. The Unified Payment Interface (UPI) can be thought of like an email ID for the user's money. It will be a unique identifier that the user's bank uses to transfer money and make payments using the IMPS. The IMPS is faster than NEFT (National Electronic Funds Transfer) and lets the user transfer money immediately and unlike NEFT, it works 24x7.

The UPI enables:

- Payment systems to be fully interoperable across all payment system players, enabling funds to be transferred between mobile wallets from different financial institutions and
- Smartphones to double up as virtual debit cards for sending and receiving money instantly

The government has been promoting smartphone-based transactions through the UPI and the Bharat Interface for Money (BHIM). BHIM (Bharat Interface for Money) is a mobile app developed by NPCI, based on UPI. It was launched by Prime Minister Narendra Modi, at the Digi Dhan mela at New Delhi on 30 December 2016.

Both UPI and BHIM use the Immediate Payment Service (IMPS), which has seen a 160 % increase in number of transactions amounting to 67 million in March 2017 up from 26 million one year ago. There is no limit on the number of UPI transactions. However, standard IMPS limits apply which vary from bank to bank.

The UPI is the cheapest method of fund transfer. The NEFT charges minimum Rs 2.5 for a transfer and the IMPS charges minimum Rs 2.5. But the UPI charges less than 50 paise for a transaction through the UPI and such a low charge has revolutionized the use of UPI for digital payments amongst all the strata of the society.

2017 has been a landmark year for India's fintech industry as India witnessed an upswing in several areas, like new-age digital assets or cryptocurrencies, simplified payment instruments like UPI, BharatQR, digital wallets etc. Technology has been the driving force behind innovative products and services that have transformed the way Indians perceive investments, transactions and the financial ecosystem as a whole.

Technology is expected to drive digital payments resulting in the entry of new players in this space. Digital payments and e-commerce are attracting more entrants into the payment space, which is increasing competition and forcing payments service providers to consolidate in order to capitalize on the economies of scale.

The Unified Payment Interface (UPI) can be thought of like an email ID for the user's money. It will be a unique identifier that the user's bank uses to transfer money and make payments using the IMPS (Immediate Payment Service). The IMPS is faster than NEFT (National Electronic Funds Transfer) and lets the user transfer money immediately and unlike NEFT, it works 24x7. The UPI is the cheapest method of fund transfer. The NEFT charges minimum Rs 2.5 (GBP 2.5 pence) for a transfer and the IMPS charges minimum Rs 2.5. But the UPI charges less than 50 paise (GBP 0.5 pence) for a transaction through the UPI and such a low charge has revolutionized the use of UPI for digital payments amongst all the strata of the society.

The buzz around fintech payments has gained substantial attention of traditional financial institutions, startups, venture capitalists and regulators alike. Banks and regulators were hard pressed to revisit their operating model and policies to create a conducive environment of collaboration and dynamism amidst the participants in the Fintech ecosystem.

As a result of the demonetization and the development of UPI:

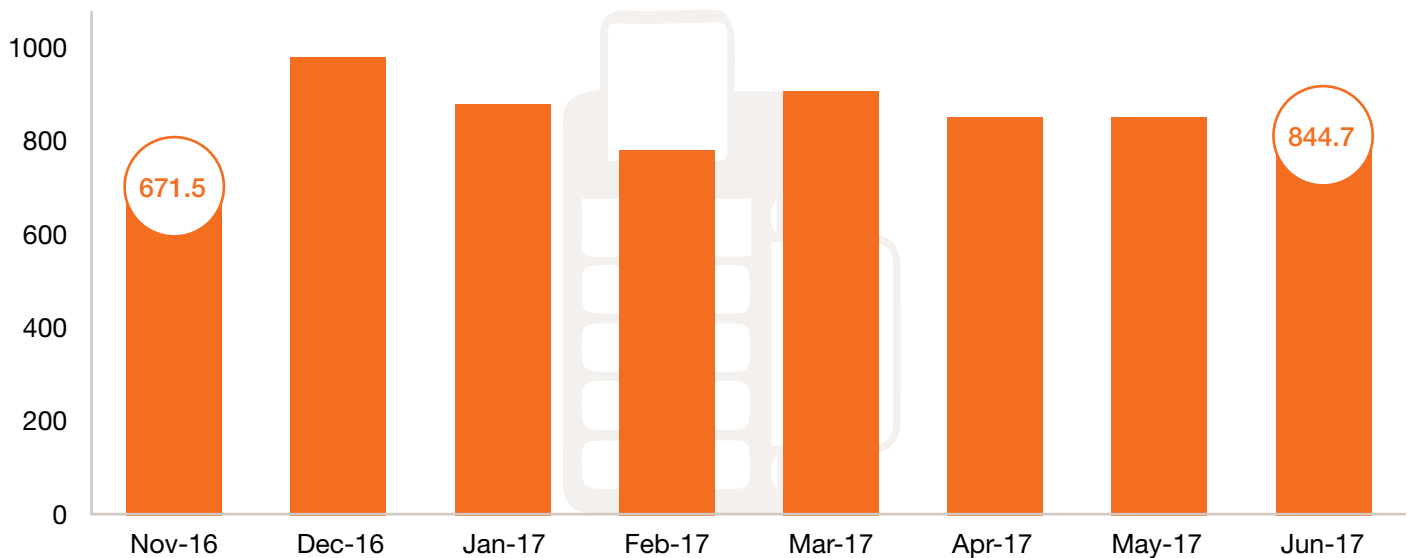
- Digital transactions grew by 4x in volume and value across various modes from wallets to cards and interbank transfers from a year earlier
- Card transactions at point of sale (PoS) terminals at merchant locations have surged
- The number of debit card transactions rose to more than 1 billion in January 2017 from 817 million last year
- The number of ATM transactions have remained constant at around 700 million, the incremental growth has been driven mostly by card swipes at PoS terminals.



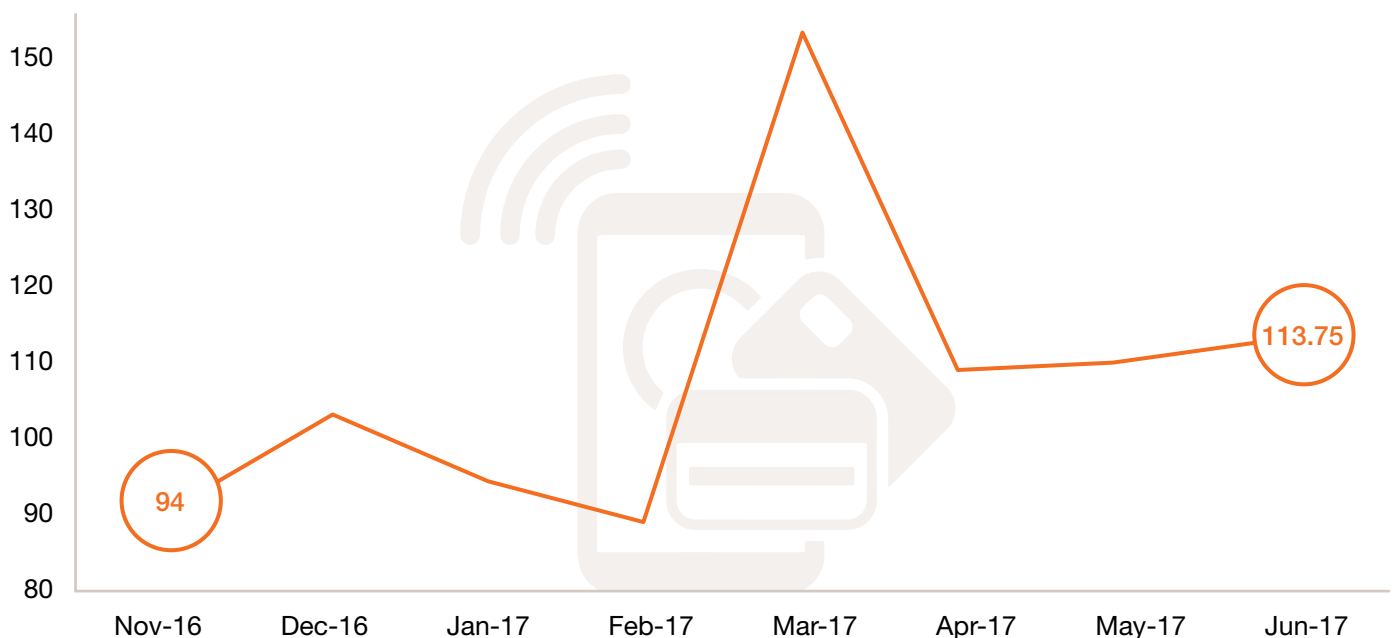
Digital push gains momentum

Digital transactions have gained momentum after the 8 November demonitization of high-value banknotes, as the government actively promotes cashless transactions to reach its target of 25 billion digital transactions in 2017-18. Monthly electronic transaction volumes crossed the 1 billion mark in July 2017. Transactions using UPI alone rose by over 10% to 11.63 million in July

Volume (in mn)



Value (Rs trillion)



Data in graph till June 2017 ; figures include some of the payment systems managed by NPCI
Source : Reserve Bank of India

Remittance market - India

The remittance market in India is serviced by commercial banks, nonbank Money Transfer Operators (MTOs), foreign exchange bureaus, cooperative banks, and post offices, as well as a wide variety of commercial entities acting as agents (and subagents). Banks are major players in India's remittance market. Both state-owned and private sector banks are taking the lead in the remittance service market by building specific technology platforms to provide remittance services, and they also are entering into partnerships with entities abroad to source remittances. The banking system covers through its branches all the states and the districts in the country, with the branch network covering many rural and semi-urban areas as well.

According to industry sources, among the banks, currently State Bank of India (SBI) and ICICI Bank dominate the market for remittances with an estimated market share of 25 percent and 20 percent, respectively. They have banking operations in many foreign countries and are leveraging their branch networks abroad to source remittances. Banks primarily process remittances that are credited to the recipient's account. Many banks also offer remittances services as agents of MTOs, wherein they disburse cash to the recipient from their branches. The interbank infrastructure composed of Real-Time Gross Settlement (RTGS) and National Electronic Funds Transfer (NEFT) systems are being used for remittances. These systems have played a big role in reducing the remittance processing time and also have enabled MTOs to move funds faster to their agents.

Money Transfer Operators

MTOs such as Western Union (WU), MoneyGram, and others are the second most widely used remittance service providers (RSPs) in India. MTOs operate in India through alliances, partnerships, and sub-agencies. Many banks have entered into partnerships with these MTOs and act as their principal agent. WU is the leader in this segment; it has more than 50,000 agent locations in India, operates in more than 7,000 cities and towns, and works with more than 30 leading banks. India Post is among the largest agents of WU. The services of MTOs are believed to be convenient and reliable. MTOs process primarily remittances that are paid out in cash to the recipients.

Faster online remittances through internet

With the use of technology becoming increasingly popular among financial service providers, Internet-based provision of remittance services has become a fast-growing business. Advancement in communications technology has made the business of international payments fast, flexible, and relatively less costly. The process is simple and paper free, and it helps the remitter track the processing of the remittance. Private banks such as HDFC and ICICI have started offering Internet based remittance services. Among state-owned banks, SBI and Bank of India have introduced online remittance services: e-remit and star-e-remit, respectively. Times of Money, a nonbanking company, also has been active in this business through its Remit2India website.

Remit2India, a part of the Times of India group, provides an Internet-based money transfer service to India. Currently, this service is available for Nonresident Indians (NRIs) in 23 countries. To send remittances through Remit2India, the remitter has to register with Remit2India and to give them online instructions to transfer money. The specified amount then is deducted from the remitter's bank account abroad and is transferred using Remit2India to the requested bank account or person in India. Currently, money can be remitted in nine currencies through this service. The remittance can be sent directly to an Indian bank account or, if the remitter opts for a demand draft facility, the remittance is door delivered as a locally payable demand draft in Indian rupees. The average processing time is three to five days but can be further decreased if higher priced express delivery service is used. Recipients also can choose to receive a prepaid card; the remittance amount is loaded onto the card. The card can then be used at ATMs and point-of-sale (POS) terminals.

Cross border money transfer startup InstaRem

InstaRem, a remittance payment startup, is getting into international money transfers, and significantly undercutting the competition on price and speed. It's probably time to wave The Western Union and Money Gram goodbye. Cross border money transfer is traditionally designed to fleece money from senders and receivers; hence, many startups are trying to disrupt the space. So the remittance market is now witnessing immense action from upcoming startups.

InstaRem is a startup that inexpensively carries cross-border money transfer, mainly, in Asia. InstaRem uses a system they call InstaPic to ease the process of document submission. Instead of trying to scan and upload, InstaPic lets users to click a picture with the webcam of their laptop. Once the data is collected, it pushes it to the Global Data Company API for authentication. The KYC is compulsory for the person sending the money. InstaRem is an account-to-account money transfer startup. What that means is they take money from a sender's bank account in the home country and transfer it to the recipient's account in the destination country. This eases the burden of KYC.

Key Drivers for growth in digital payments

Need for Ultra-Fast Payments

Instant payments are likely to become catalysts for next generation payments technology offering customers better and faster payments solutions.

Due to the steady growth in technology, digital transactions is on the rise than ever before. By 2020, around 720 billion transactions are projected to occur through the use of digital payment methods in the Indian market. This development is largely driven by the deep penetration of smartphones in India. Initiatives such as the development of UPI technology will lead the way forward for mobile payments in India.

Contactless and wearable payments will gain acceptance

Contactless payments are here to stay. Contactless payments allow you to transact with a mere tap against the point-of-sale terminal, without having to swipe or insert your card at the merchants' outlet.

With the widespread use of smartphones, mobile banking and payments applications have gone mainstream, and wearables provide convenient access to such applications. According to one study, 500 million wearable devices will be sold by 2021, with an estimated 20% of these devices equipped with payment technology. Most wearable payment devices come with NFC (Near-field communication) technology which guarantees a quick, secure, form of payment.

A study from Juniper Research predicts that mobile and contactless payments will reach a global value of US\$95bn by 2018. Mobile payments is a step towards increasing financial inclusion as it can lower the cost of providing basic financial services by 80% to 90%. For instance, the data collected

through mobile payments enables lenders to assess the creditworthiness of borrowers and can be used to create tools to help businesses better manage their finances.

Digital wallet usage to grow

Taking a stride ahead towards becoming a digital economy, over the last two years, India has witnessed an increasing use of digital money through E-wallets. These digital wallets have eliminated the necessity to carry cash to a great extent and are replacing the conventional methods of payments.

It is estimated that digital wallets could account for as much as 46% of all transactions across the world. The growing adoption of mobile wallets can be attributed to an increase in cyber-security technology. Since every aspect of digital wallet payments is encrypted, along with high-security features involving PINs and fingerprints required for transactions, these are much safer than traditional wallets. The most trusted E-wallets use the secure servers of banks for completing the transactions. The Reserve Bank of India also issues the PrePaid Payment Instrument license to the completely secured E-wallets. Secondly, all the top E-wallets keeps customer's personal data safe and encrypted. This covers customers' personal safety as well.

With many businesses offering digital wallets as a payment option, consumers are more likely to get on boarded with them in 2018.

Developments in Payments landscape in India

Payments methods in India have leapfrogged from cash to alternate modes of payments registering a phenomenal growth since the past 5-10 years. A major role in kick-starting the revolution of Fintech in India was played by startups offering digital mobile phone recharges. This evolved to digital recharges, which in turn evolved into digital wallets and usage of wallets for various other commercial activities. The fact that these new offerings have strongly impacted consumer behavior has not only attracted attention from more technology savvy individuals, but also a lot of investments both within India and from outside.

As per 'The Growth of Fintech in India' by Make in India, India currently has 600+ Fintech startups in the space of lending, payments, blockchain, InsurTech and RegTech. The number of startups will grow further with initiatives such as focused accelerator programs by local and regional governments and banks, and funding support by leading corporates and VCs. The digital penetration growth in India is driving e-commerce, and the usage of wallets for enabling commercial transactions has led to an increased demand for payment offerings. This kind of cross-industry growth has been driving VC firms to invest across segments. Apart from international financial institutions, India's largest national bank State Bank of India have set up their own innovation hub and a Fintech start-up accelerator program to attract the best startups.

There are more than 70 wallet providers in India today and more than 350m users. The three main payment service providers in India are Paytm (230m), MobiKwik (55m) and FreeCharge (50m).

Mobile Wallet Overview

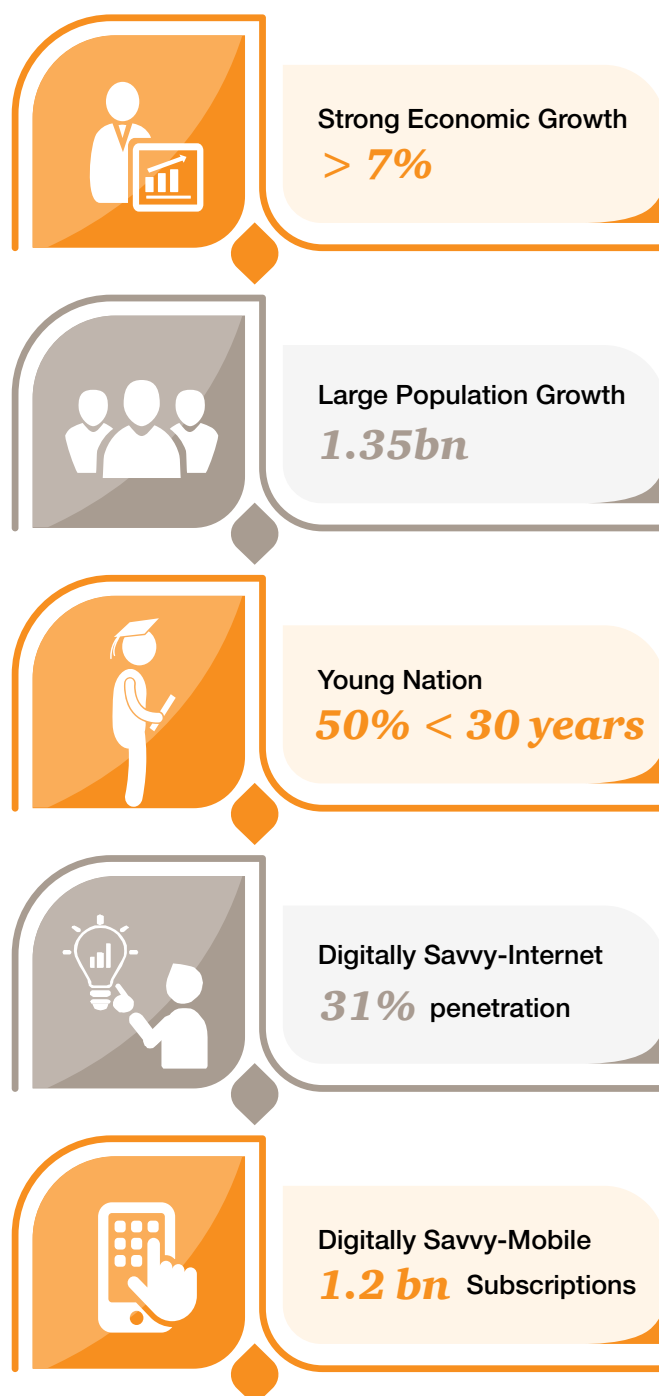
	Paytm	MobiKwik	FreeCharge
Founded	2010	2009	2010
Number of Users	230m	55m	50m
Type of wallet	Independent	Independent	Bank Led

Source: Barclays Research, Company Data, Funding Data - Crunch Base

The need for scale and innovation following UPI/Aadhaar is putting some pressure on current players. In addition the traditional banks are trying to play catch-up with Axis bank (India's third largest private bank) that bought FreeCharge for \$60m in July 2017 and Bajaj Finance taking an 11% stake in MobiKwik for \$327m in early 2018. Paytm – India's largest mobile wallet – also strengthened its financial base with a \$1.4bn investment from Softbank in May 2017 and is expanding its functionality to become a financial engagement app with the ultimate goal of becoming a bank in the box. In April 2017, Paytm launched Paytm Gold – a product that allows users to buy, store and sell gold through its platform. It also launched its Payments bank in 2017, with the target to double its user base by 2020. Paytm has been one of the most aggressive mobile wallets with respect to product differentiation.

Economic conditions are supportive

To support the government's ambition to become the world's leading digital nation, it is worth noting that both India's growing economy and the demographic profile is accommodating such a large scale change taking place in the payments space. India is home to a large population of young, digitally-savvy individuals, contributing to an economy which is one of the fastest growing in the world. Based on various factors as depicted in the diagram below, we believe India's payment ecosystem is likely to undergo a period of rapid change over the next five years.



Source: Barclays Research

Fast payments

Leveraging on the high mobile density in India, many payment service providers (PSPs) have been utilizing mobile payment apps to link underlying payment instruments with mobile phone numbers for fast and instant payments via the Immediate Payment Service (IMPS) or for issuance of mobile-wallets. The UPI developed by NPCI provides complete **interoperability** for merchant payments. The UPI allows users to link their bank accounts with their mobile phone numbers through an application provided by the PSPs and obtain a virtual address which can be used for making and receiving payments. Introduction of UPI has the potential to revolutionize digital payments and take India a step closer towards being a “Less Cash” society

Process Innovation

With the nation-wide implementation of Aadhaar (Biometric identification), providing a unique identification number to all residents of India, NPCI has launched an Aadhar Enabled Payment System (AEPS) which is a safe and convenient channel allowing micropayments with every transaction validated by biometric authentication.

Wallets

The relatively traditional mode of payments include cheque, electronic payments through NEFT, RTGS (Real Time Gross Settlement), etc. and card (debit and credit) payments. The need for prepaid payment instruments in the form of physical card or e-wallet was introduced to give non-bank customers the facility to use electronic modes of payments and give existing bank customers a safeguard measure that limits the extent to which they are exposed. The emergence of bank and non-bank payment wallets in India has changed the landscape of payments. Many start-ups have entered this space to simplify mobile money transfer, such as Chillr application, which provides peer-to-peer money transfer without using bank account details. To perform a transaction, all you need to do is select the Chillr Contact -> Enter Amount and Remarks -> Authenticate using your secret MPIN. The money will get transferred instantly to the beneficiary's account. Several leading banks have launched their own digital wallets leveraging NPCI's IMPS platform.

BHIM (Bharat Interface for Money)

BHIM is a mobile app developed by NPCI, based on UPI. It intends to facilitate e-payments directly through banks and as part of the drive towards cashless transactions. BHIM allows users to send or receive money to other UPI payment addresses or scanning QR code or account number with IFSC code or MMID (Mobile Money Identifier). Users can create their own QR code for a fixed amount of money, which is helpful in merchant transactions



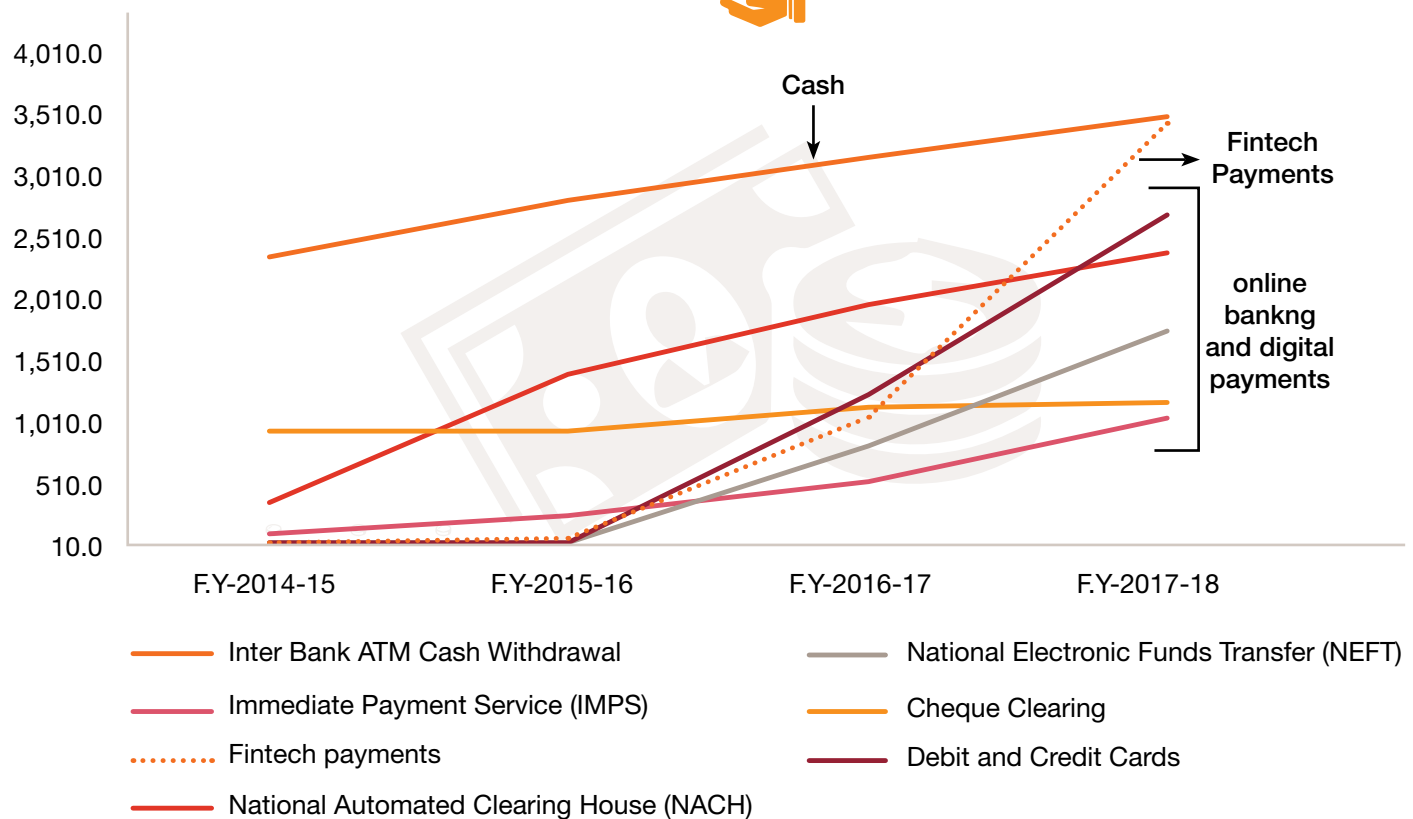


Opportunities and Challenges faced by Fintech Payment Firms in India

The section below outlines all the potential opportunities and challenges faced by Fintech Payment firms in India:

Indian Payment Fintech journey so far:

NPCI Operated Payment Systems - Volume in millions



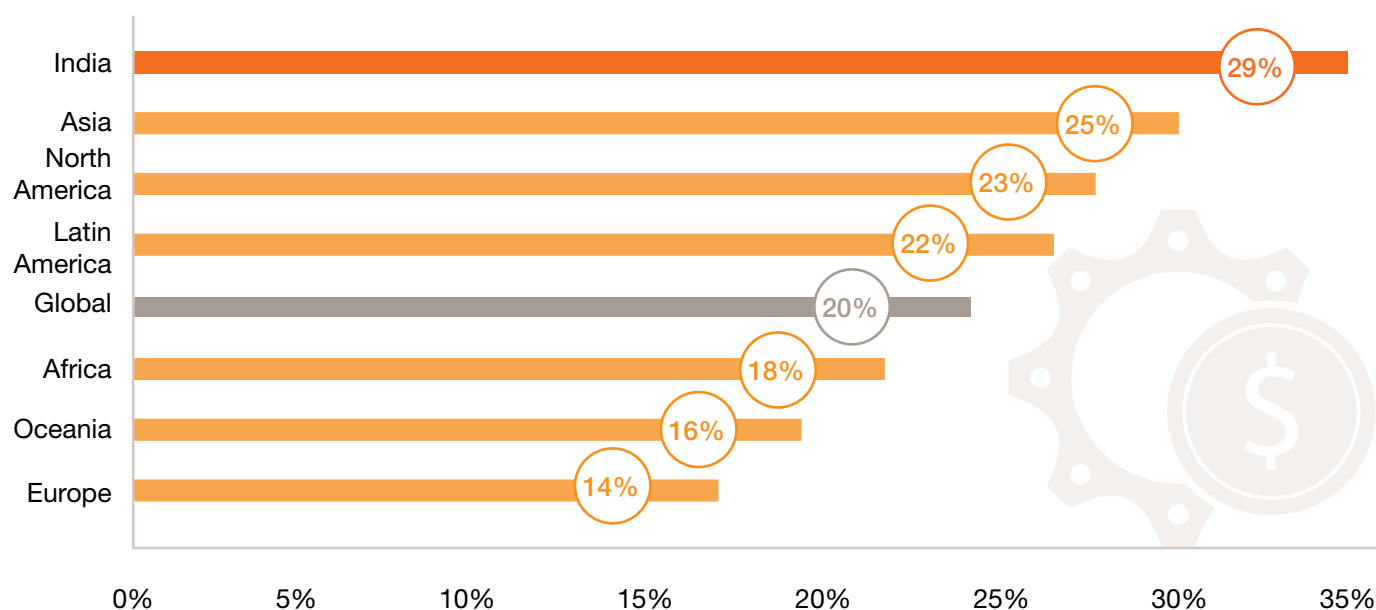
UPI (Unified Payment Interface) has already surpassed the credit card volume within 2-3 years of its launch.



The diagram above reflects the meteoric rise in retail digital payments since the past 2-3 years owing to a surge in mobile banking payments and payments through digital e-wallets through UPI integration like Paytm, Rupay, Google Tez and BHIM etc. While

the volume of cash transactions is the highest, retail digital payment transactions are soon catching the attention of the Indian population through a combination of basic marketing and awareness initiatives from Fintech players and the Government.

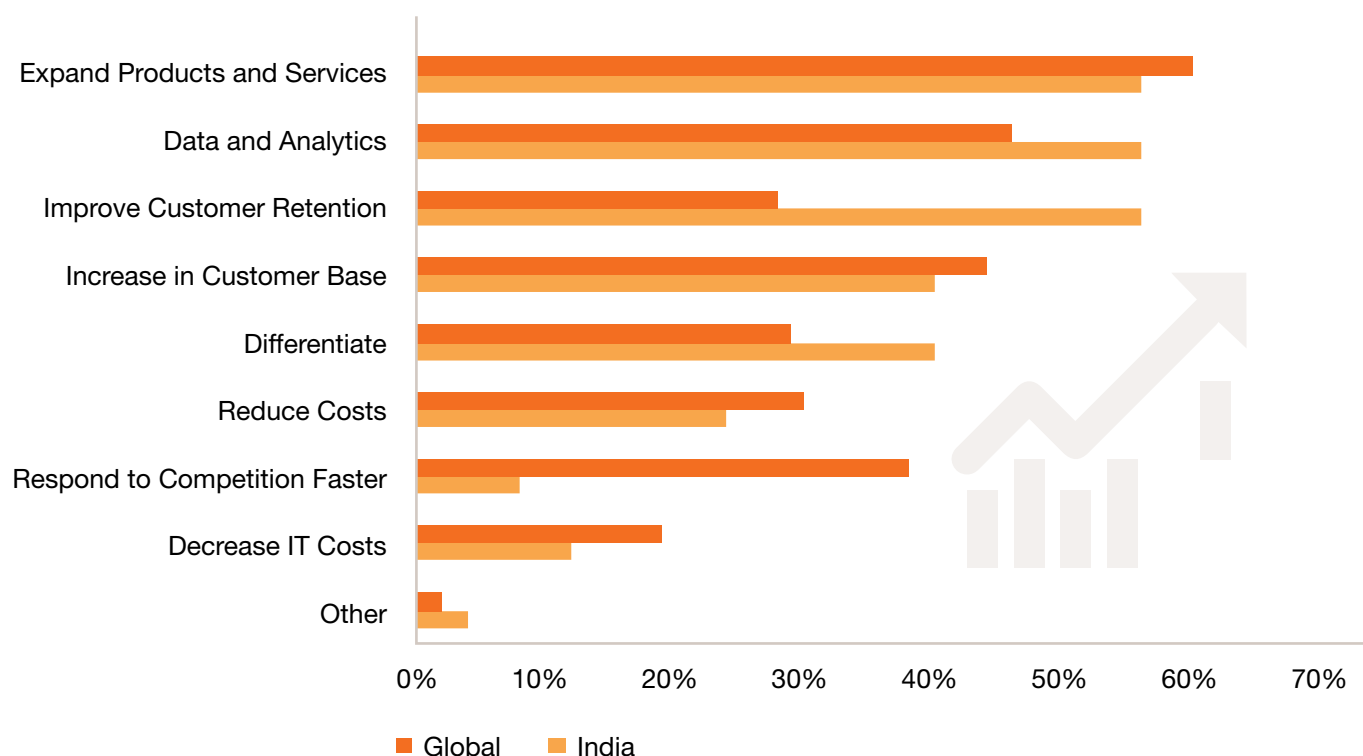
Expected Annual ROI on Fintech Investments



The average return on investment in the Indian Fintech eco-system is close to 30% as compared to the global average return of 20% and an average of 14% across the UK and Europe. This represents a huge opportunity for UK Fintech firms to identify challenges within the Indian Fintech landscape and come up with corresponding solutions that has already been successfully adopted in the UK since the past 5-7 years.



Most Promising Fintech Opportunities



Considering the pace at which the Fintech landscape is rapidly evolving in India, focusing on customer retention through expanding relevant products and solutions along with data analytics has been identified as the top three promising Fintech opportunities in India.

Key achievements and opportunities in the Indian Fintech payments space:

Government initiatives:

- A strong, proactive policy level support from the government has been providing a much-needed boost to user adoption of digital payments. Initiatives such as Jan Dhan Yojana, Aadhar and the emergence of UPI provide a good foundation for FinTech companies to permeate 'last mile' touchpoints and boost financial inclusion across the country.
- The last two years have been revolutionary for the digital payment industry in India on account of the demonetization drive in 2016. In search for a new alternative to replace cash, Indian citizens turned to digital transactions, which witnessed a 400 – 1,000% increase since the beginning of the demonetisation.
- The growing appetite to leverage the Fintech capabilities between the UK and India is further strengthened by the Indian Prime Minister's

visit to the UK in April 2018 where a number of Fintech initiatives were launched by the British government under the Indo-UK Technology Partnership. This includes a proposed new regulatory cooperation agreement focusing on Fintech and financial services collaboration covering areas such as Artificial Intelligence (AI), digital payments and technical cooperation to help develop markets in insolvency, pensions and insurance.

Untapped potential

- The financial services market in India is largely untapped – **40%** of the total population is currently not connected to banks (unbanked) and more than **80%** of the payments in India are still made by cash. This untapped Indian Fintech market provides a massive opportunity to significantly increase demand in almost every category – consumer lending, insurance, trade finance, digital payments etc. In each of these areas, new Fintech solutions can help the market to grow significantly.

- As per National Payments Corporation of India (NPCI) which is an umbrella organization (set under the initiative of the RBI and Indian Banks' Association) for all retail payments and settlement systems in India, from April 2017 to March 2018, total financial transactions on NPCI's digital payment platforms with respect to retail payments were to the tune of INR 200bn and this is expected to grow up-to INR 1tn by 2023 that represents a whopping 400% increase over the next five years.
- As per a recent report by the Reserve Bank of India (RBI) in January 2018, total digital payment transactions stood at 1.06 billion transactions for the month of December 2017. The total number of payment system operators in India stands at 91 till date and mobile wallet transactions have risen 590% year-on-year as of January 2018.
- The introduction of UPI is making a significant impact in the payments landscape across India. By 2020, around 720 billion transactions are projected to occur through the use of digital payment methods in the Indian market. This development is largely driven by the deep penetration of smartphones in India along with the development of UPI technology that will lead the way forward for mobile payments in India.
- Similarly as of December 2017, Aadhar based transactions stood at 2bn (volume) clearly pointing towards the growing trend in retail digital payments by leveraging Aadhar through the NPCI platforms.

Example growth stories

- A number of Fintech players from the UK like Onfido, Creditscore, and Currency Direct etc. have established their presence in India since the past 12-18 months to take advantage of the growing appetite for Fintech solutions in India and at the same time leveraging from their experience in London that serves as a mature Fintech market.
- Given the fact that within 10 months from the launch date, a Fintech Payment product like Google Tez that integrated with UPI has almost gained more than 50% market share in the UPI payments space, this clearly indicates the scope of growth for overseas Payment firms in India. Firms like Facebook's WhatsApp Pay is going through Beta testing across its 250 MN user base.

Potential Challenges faced by Indian Fintech Payment firms

Technical integration

Weak technical integration is one of the challenges faced by the payment firms. There is a lack of interface between the processing systems which lead to processing and payment delays, increased fees and lost transactions. A payment processor that provides for immediate and individually processed transactions can open client accounts in more than one acquiring bank, thus avoiding the delays often inherent in automated clearinghouse processes. The lack of improved technology also leads to inability to handle huge traffic when new products are introduced.

Cyber security issues

Whilst cyber security threat is prevalent across the globe across the developed capital markets like the UK, US, Singapore etc., in a rapidly emerging Fintech Payments market like India, this threat is all the more pertinent considering the size of the payments market and the fact that India is one of the most vulnerable countries in the world that is prone to cyber-attacks.

Safety Concerns

Increasingly, people are concerned about the safety of the information submitted to the payment firms. There is a negative image which is formed regarding the information security and tracking of shopping habits. The applications study consumer behavior and payment history, thus collecting valuable data for targeted advertising leads. The personal accounts created by the users store a variety of information and preferences, enabling the automation and personalization of payments, which can be initiated anytime, anywhere, with virtually no geographic boundaries.

High Competition

With low barriers to entry, many entrepreneurs are coming up with aggregating services. There are a lot of online portals which provide similar services. Telecom service providers like Vodafone and Airtel are also providing online payment gateways. Banks have also entered into the online payments space and are providing e-wallets along with the savings accounts.

Multi-currency payment methods

Accepting a variety of payment methods and currencies would require new bank accounts, new business entities, and new regulatory hurdles in each national market. A payment service provider with the necessary infrastructure already in place can provide effective, and immediate, solutions to those problems.

Regulatory Challenges

There are certain guidelines which need to be followed by the payment firms in India. Companies have to convert existing wallets which did not have complete KYC to full KYC compliant wallets. Without this, no further credit will be allowed in these wallets. The RBI also mandated that a minimum net worth of Rs. 25 crore (circa GBP 2.6m) should be maintained by the year 2020. This will pose a problem for smaller wallet companies including start-ups who are keen to set-up a payments services firm in India.

Secondly the RBI on 6 April 2018 came up with a notification on 'Storage of Payment System Data' directing all payment companies (both local and overseas) to store data locally within India with a six months deadline to report compliance on this requirement to the RBI by 15 October 2018. Whilst this may not necessarily be viewed as a regulatory challenge, overseas payment firms like Visa, Mastercard, Google etc. will have to comply with the RBI requirements and make all necessary arrangements by October 2018 to ensure the data related to payment transactions processed within India are stored locally in a system housed within India. Over the past 3-4 years, there has been considerable growth in the payment ecosystem in the country. Such payment systems are also highly technology dependent, which necessitates adoption of safety and security measures, which are best in class, on a continuous basis.

The genesis of such a notification is that RBI observed that not all payment system providers store the payments data in India. In order to ensure better monitoring, it was important for the RBI to have unfettered supervisory access to data stored with these system providers as also with their service providers / intermediaries/ third party vendors and other entities in the payment ecosystem. As a result of this requirement it was decided that:

1. All system providers shall ensure that the entire data relating to payment systems operated by them are stored in a system only in India. This data should include the full end-to-end transaction details / information collected / carried / processed as part of the message / payment instruction. For the foreign leg of the transaction, if any, the data can also be stored in the foreign country, if required.

2. System providers shall ensure compliance of (i) above within a period of six months and report compliance of the same to the Reserve Bank latest by October 15, 2018.
3. System providers shall submit the System Audit Report (SAR) on completion of the requirement at (i) above. The audit should be conducted by CERT-IN empaneled auditors certifying completion of activity at (i) above. The SAR duly approved by the Board of the system providers should be submitted to the Reserve Bank not later than December 31, 2018.

Compliance with RBI's data storage requirements for payments by October 2018 could present a huge challenge for overseas Fintech firms that process all payment transactions from India from systems that are housed overseas.

Regulatory landscape in India

From payments perspective there are two master directions from the RBI (Reserve Bank of India) that any firm interested in operating in India should look into:

- Master Direction on Issuance and Operation of Prepaid Payment Instruments
- Master Directions on Access Criteria for Payment Systems



The key themes of these circulars is captured below and categorized into four categories as below:



Process

- All non-bank entities seeking authorisation from RBI under the PSS Act shall have a minimum positive net-worth of Rs. 5 crore as per the latest audited balance sheet at the time of submitting the application. These entities shall submit a certificate in the enclosed format, from their Chartered Accountants (CA) to evidence compliance with the applicable net-worth requirement while submitting the application for authorisation. The application shall be processed by RBI based on this net-worth which shall be maintained at all times. Thereafter, by the end of the third financial year from the date of receiving final authorisation, the entity shall achieve a minimum positive net-worth of Rs. 15 crore which shall be maintained at all times.
- PPI issuers shall maintain a log of all the transactions undertaken using the PPIs for at least ten years.
- There shall be a Board approved policy clearly laying down the framework for engaging agents for the purpose of issuance and reloading of PPIs.
- A non-bank entity desirous of setting up payment systems for issuance of PPIs shall apply for authorisation in Form A (available on RBI website) as prescribed under Regulation 3(2) of the Payment and Settlement Systems Regulations, 2008 along with the requisite application fees.
- Cash loading to PPIs shall be limited to Rs.50, 000/- per month subject to overall limit of the PPI.
- Amounts only up to Rs.50, 000/- from individual inward MTSS remittance shall be permitted to be loaded / reloaded in PPIs issued to beneficiaries. Amount in excess of Rs.50, 000/- under MTSS shall be paid by credit to a bank account of the beneficiary. Full details of the transactions shall be maintained on record for scrutiny for cross border inward remittance.



People

Issuers shall carry out proper due diligence of the persons appointed as authorised / designated agents for issue / reloading of permissible categories of PPIs.



Governance

- Issuers shall carry out proper due diligence of the persons appointed as authorised / designated agents for issue / reloading of permissible categories of PPIs.
- Issuers shall be responsible for all the PPIs issued by the authorised / designated agents.
- Issuers shall be responsible as the principal for all acts of omission or commission of their authorised / designated agents, including safety and security aspects.
- The PPI issuers shall regularly monitor the activities of their authorised / designated agents and also carry out a review of the performance of various agents engaged by them at least once in a year.
- Issuers and their authorised / designated agents shall ensure adherence to applicable laws of the land, including KYC / AML / CFT norms



Technology

Issuers shall ensure preservation of records and confidentiality of customer information in their possession as well as in the possession of their authorised / designated agents.

Great potential for the growth of digital payment services in India

Due to the underdeveloped payment infrastructure and high growth there are ample opportunities for new entrants to enter the Indian digital payments market. Mobile wallets are the new entrants with a clear focus on enhancing consumer experience by delivering a seamless digital payment experience. In spite of all the challenges faced within India both from a technology, governance and regulatory stand point, given the size of the payments market both in terms of volume and value, the growth potential for Fintech players in the digital payment space is unparalleled.



3

UK's Fintech growth and regulatory landscape on digital payments

This section focusses on the growth of the Fintech payments eco-system in the UK since the past 5-7 years (post the global financial crisis) and how the regulatory regime has evolved to deal with the unique challenges faced by the digital payments industry.



The UK's Fintech growth so far

FinTech is one of the great, recent success stories of the UK's financial services sector. The UK is widely acknowledged as a world leader, with a burgeoning startup ecosystem, a forward thinking regulator, and a vibrant tech industry. The FinTech sector continues to evolve and after several years of excitement about the sector's potential to change the face of financial services, some of that change is starting to become real, with leading FinTechs commercialising their services at pace, both independently and in collaboration with incumbents.

Technology entrepreneurs and businesses are attracted to London for its diverse talent pool and unique business ecosystem. London always remains open to investment attracting the best tech talent from all over the world. Post Brexit and in spite of the economic and political uncertainty, the European FinTech sector is in a healthy position, led by the UK. Regulators across Europe are following the UK's example as they seek to foster an agile environment conducive to innovation. The UK, meanwhile, has built FinTech bridges with a growing number of international markets and continues to attract investors from all over the world.

FinTechs are concentrating on specific niches at both the banking front and back-ends, including:

- Consumer and SME lending: marketplace lenders (or peer-to-peer [P2P] lenders) such as Funding Circle, RateSetter and Zopa)
- Wealth management: digital platforms such as Moneybox and Nutmeg
- Cross-border payments: payment providers such as TransferWise, CurrencyFair, Revolut and Azimo
- Payment acquisition: mobile point-of-sale solutions such as Square and iZettle
- Distributed ledger technologies: companies such as Ripple and BitPay.

These FinTechs tend to prioritise speed, convenience and cost. The UK marketplace lending market revealed that aspects of a pleasant user experience, such as an 'easy/quick application process', 'fast decision-making' and the 'convenience of an online platform' were the strongest drivers of consumer borrowing from marketplace lenders. All of these trumped 'competitive rates', traditionally the main tool of competition among banks.

However, the factors that led to the initial growth in the FinTech sector are now fostering the growth of a new type of FinTech – one that offers 'whole of market' customer propositions: mobile-only banks centred around smartphone apps. These new players are prioritising customer experience and the user interface. For example, by allowing consumers to customize their app, they can provide a more tailored and personalized service. And by delivering improved speed and convenience, they hope to reduce (or even eliminate) some of the common 'pain points' in banking around issues such as account opening and on-boarding.

While previous FinTech innovations have targeted select services within a bank's overall offering, these newer entrants are targeting banks' core customer relationships by seeking to capture the customer interface. Where FinTech companies were once seen as a threat to the incumbents, promising disruption in an industry suffering from a loss of customer trust, the emphasis has shifted to collaboration. FinTech now also has a lens on technologies that address operational challenges as well as customer expectations. Advances in areas such as artificial intelligence, big data and blockchain offer huge opportunities in this context. These areas are opening up new avenues of growth and delivering greater operational efficiency and productivity, while all the time focusing on specific customer pain points.

There has been an increasing familiarity with blockchain, coupled with an expectation for more Financial Institutions to adopt blockchain as part of their production system or process in the next three to five years. This increased adoption will have a notable effect on the payments/trade infrastructures, digital identity management, and post-trade settlement as these areas present the most relevant business use cases of blockchain in the Financial Services sector.

Funding and long term strategic investments:

The year 2017 was a record year for the UK Fintech sector, with London-based firms attracting the lion's share of funding according to data from London & Partners. The findings also revealed that the UK is Europe's leading country for global tech investors, with British tech firms attracting more venture capital funding than any other European country in 2017.

Last year saw a number of the world's leading tech companies pledge their long-term commitment to the capital, with significant investments from Amazon, Apple and Google. In the second half of last year, Spotify announced it will expand its R&D operation in London and double its headcount, while US tech

giant Facebook confirmed it will create an additional 800 jobs for its new London headquarters.

Prioritisation in the innovation process is key for Financial Institutions. Figuring out the needs in the market first, and investing selectively to learn, will create opportunities for Financial Services companies. By adopting one of the many solutions brought by innovators, Financial Institutions can gain incremental returns and find a way to expand new products and services and reach new customers. Adding option-creating investments, including transformational growth opportunities, to the portfolio helps Financial Institutions optimise their innovation process and better serve clients' needs. Scaling back to focus on selective investments will pay out and may eventually lead to the expected annual Return on Investment (ROI) of 20%.





Regulatory landscape

The regulatory system in the UK supports a complex and diverse financial services industry and it is one of the most sophisticated and mature in the world. The UK has been at the forefront of setting international standards and leads the way in supporting innovation.

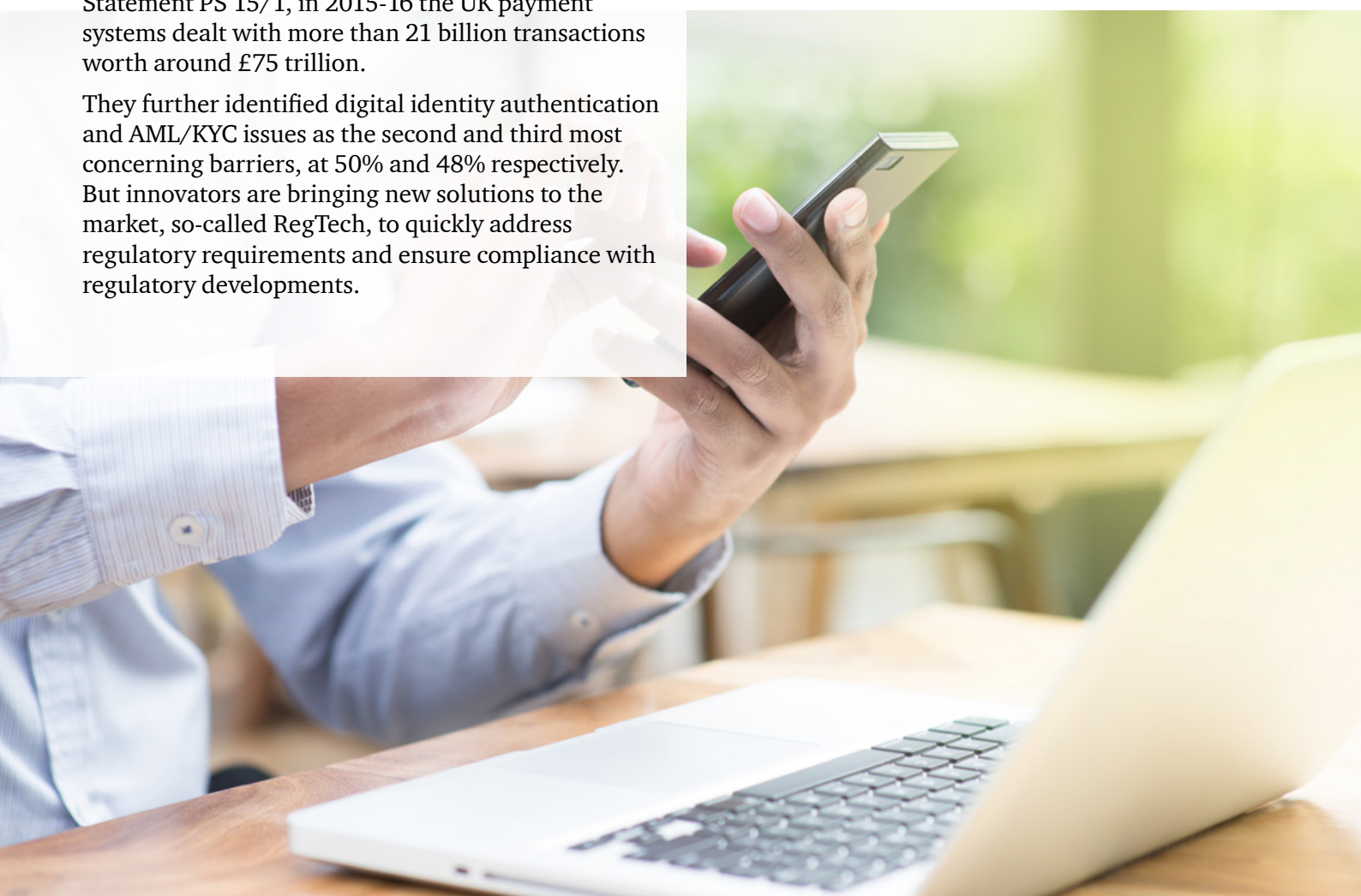
The main regulatory barriers to innovation, as indicated by 54% of participants in a global PwC Fintech survey of 2017, are data storage, privacy and protection. Interestingly both these areas appear as a regulatory and operational challenge within India as well due to recently introduced RBI requirements on data storage and customer's apprehension over the use of their personal data by digital payment firms.

The payment systems underpin virtually every financial transactions made – whether that's major institutions transferring large sums of money to each other or consumers receiving their salary or pension into their account. As per the UK FCA's Policy Statement PS 15/1, in 2015-16 the UK payment systems dealt with more than 21 billion transactions worth around £75 trillion.

They further identified digital identity authentication and AML/KYC issues as the second and third most concerning barriers, at 50% and 48% respectively. But innovators are bringing new solutions to the market, so-called RegTech, to quickly address regulatory requirements and ensure compliance with regulatory developments.

In some cases, regulations also act as a catalyst in the market, forcing incumbents into action. For example, the Payment Services Directive (PSD2), which will give rise to open banking across the UK and Europe by democratizing the availability of financial services products, or the General Data Protection Regulations (GDPR), which will change data protection and portability laws.

Regulation has been concurrently driving what we believe will bring about a revolution in UK retail banking and payments space – open banking. In this development, regulators are seeking to drive increased competition and innovation by opening up customer banking data to third parties.





Payment Services Regulation (PSR)

Almost all new regulations since 2008 have focused on tightening the banking business and operating model. The Second Payment Services Directive (PSD2) on the other hand requires banks to open their payments infrastructure and customer data assets to third parties that can then develop payments and information services to your customers. That is why PSD2 is not only a regulatory compliance and technology challenge, but also a strategic and operational one. Meeting this challenge requires a clear strategy, operational and infrastructure change, a clear focus on assessing and managing risks, and meticulous execution.

The call for a regulator to oversee the payment systems industry began with a series of reviews, starting with the Cruikshank Report in 2000. This was followed by a number of subsequent government-led reviews, reports and consultations. Following Her Majesty (HM) Treasury's consultation Opening Up UK Payments in March 2013 the Payment Services Regulator (PSR) was officially created as an independent subsidiary of the Financial Conduct Authority (FCA) under the Financial Services (Banking Reform) Act 2013.

In April 2014 the PSR started work, engaging with the payments systems industry. The PSR became fully operational a year later on 1 April 2015. The UK regulator's goal is to promote competition and innovation and to ensure payments systems are operated and developed in the interests of the people and businesses that use them.

The measures the PSR have set out recognise that payment systems must be resilient, competitive, dynamic and respond to the needs of the people and businesses using them. Systems need to be transparent to gain trust and accessible to a wide range of businesses and service-users who in turn can deliver competitive services to consumers.

The PSR can only use its regulatory powers in relation to payment systems designated by HM Treasury, which keeps this list under review. Their concurrent competition powers apply more broadly to any payment system active in the UK.

The designated payment systems are:

- **Bacs:** Bacs is the interbank system that processes payments through two principal electronic payment schemes: Direct Debit, which is used by

individuals to pay bills, and Bacs Direct Credits, which are used by businesses to pay employee salaries and wages. Bacs Payment Schemes Ltd (BPSL) operates the Bacs payment system.

- **CHAPS:** CHAPS is the UK's real-time, high-value sterling payment system, where payments are settled over the Bank of England (the Bank's) Real Time Gross Settlement (RTGS) infrastructure. CHAPS processes both wholesale (e.g., international payments) and retail payments (e.g., house purchases). In November 2017 the Bank took over the operation of the CHAPS payment system. Despite being the operator of CHAPS, the Bank does not fall within the scope of PSR's regulatory powers. However, the PSR continues to regulate the remaining participants in the CHAPS payment system.
- **C&C (Cheque & Credit):** Cheque & Credit (C&C) is the interbank payment system in England, Scotland and Wales that processes cheques and other paper instruments. C&CCCL (Cheque and Credit Clearing Company Ltd) operates the C&C payment system.
- **Faster Payments Scheme (FPS):** Faster Payments Scheme (FPS) provides near real-time payments as well as standing orders. Almost all internet and telephone banking payments in the UK are now processed via FPS. It is also used by PSPs to process other services. Faster Payments Scheme Ltd (FPSL) operates the FPS payment system
- **LINK:** LINK is the interbank payment system that enables you to take cash out of your bank accounts (and other activities) using the LINK network of ATMs in the UK. LINK Scheme operates the LINK payment system
- **Northern Ireland Cheque Clearing (NICC):** Northern Ireland Cheque Clearing (NICC) processes cheques and other paper instruments in Northern Ireland. Belfast Bankers' Clearing Company Ltd (BBCCL) operates the NICC payment system
- **MasterCard:** MasterCard is the card payment system operated by MasterCard Inc.
- **Visa Europe (Visa):** Visa is the card payment system operated in the UK jointly by Visa Europe and Visa UK

The Regulatory framework and approach of the PSR

Some of the key characteristics of the PSR regulation are:

- Develop and protect competitive markets where possible and contribute to the creation of market conditions in which innovation thrives and service-users' interests are protected.
- Prioritise actions that will have a widespread positive impact across the market and take the approach of incentivising good outcomes rather than controlling them.
- Regulate only where the regulator have clear evidence that they need to do so and where they expect the benefits of their regulation will outweigh any costs or unintended consequences. The PSR will be proportionate in how it regulates – choosing to use broad standards or precise rules depending on the context.
- Take independent decisions for which they are ultimately accountable to Parliament. Those decisions will be deliberate, transparent and predictable.

Regulatory tools available with the PSR

The PSR's regulatory tools include legislation, rules issued by the PSR (called general directions and requirements), written guidance, and decisions (sometimes called specific directions and requirements).

The PSR rules, decisions and guidance apply to the participants of the payment systems it regulates, defined as:

- operators of regulated payment systems
- payment systems providers
- infrastructure providers

Working with other regulators

As the economic regulator for the payment systems industry the PSR work with and talks to other regulators and competition authorities within and outside the UK, including the Bank of England, PRA, FCA and CMA whenever that helps meet our objectives. The PSR is specifically collaborating with the FCA and the CMA on the following:

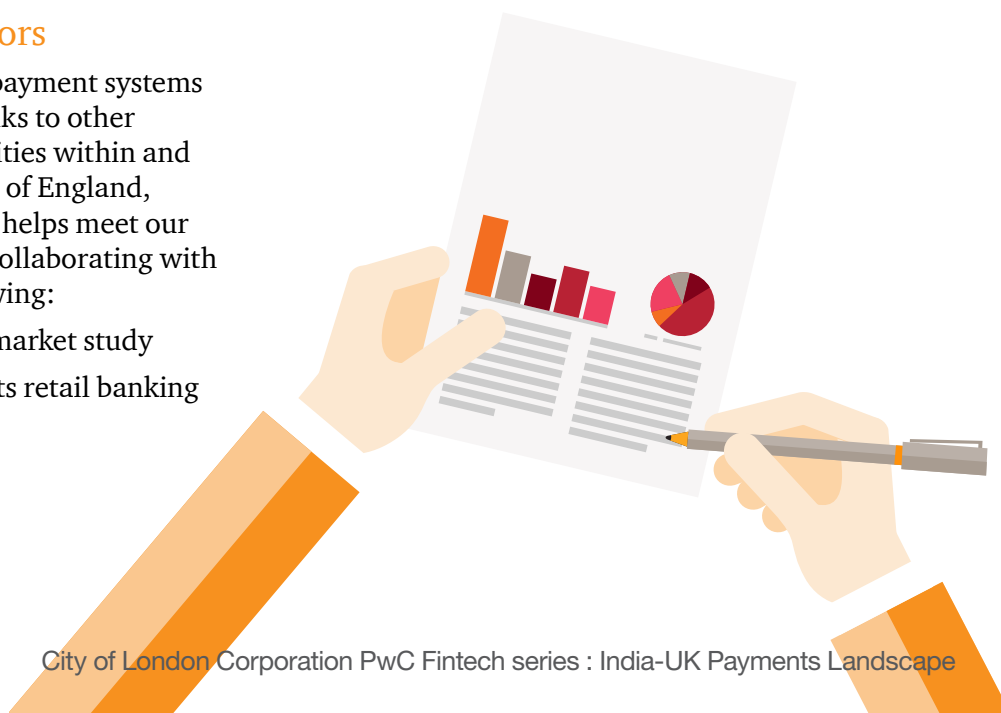
- with the FCA on its credit card market study
- coordinating with the CMA on its retail banking market investigation

The PSR also works with other sector regulators and competition authorities, for example through the UK Competition Network, European Competition Network and UK Regulators' Network, to ensure that the PSR share experience and best practice on regulatory and competition matters.

In a nutshell the PSR regulation that covers the EU's PSD 2 (Payment Services Directive 2) regulation is a comprehensive set of regulations on payment service providers covering ownership and governance of payment systems, direct and indirect access to payment systems and interchange fees requirements and serves as a global best practice for payment firms from emerging markets such as India.

The year 2018 is set to be a game-changing year for retail banking as PSD2 takes effect across the EU and the European Economic Area. By 13 January 2018, Member States will have to implement the revised Payment Services Directive into their national regulations. PSD2 builds on the legislative framework established by PSD. It acknowledges the rise of payment-related 'FinTech' companies and aims to create a level playing field for all payment services providers while ensuring enhanced security and strong customer protection.

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Open banking under PSD2

The phrase ‘open banking’ is used to describe the shift from a closed model to one in which data is shared between different members of the banking ecosystem with authorisation from the customer. So open banking demands a fundamental rethink of the traditional banking business model, enabling banking to become more customer centric.

The exchange of customer data looks set to level the playing field between incumbents and new entrants, increasing competition. Even more importantly, open banking will facilitate the creation of new products and services that were previously impossible to imagine.

Though PSD2 represents a huge opportunity for banks, the wider Fintech players and for the end customers, it equally poses a challenge for the industry as a whole in terms of cost of compliance and the complexities involved. Open banking has already initiated a visible shift from a closed banking model to one in which data is shared between different members of the banking ecosystem with authorisation from the customer.

Open Banking Standard: a step forward towards democratization of financial products

Advances in technology and the evolution of the digital landscape, fueled by the always-on interconnected web, are now enabling regulatory interventions that have the potential to drive truly revolutionary change.

In 2015, HM Treasury requested the formation of an Open Banking Working Group (OBWG) to explore how opening up bank data in the UK could benefit consumers and how these benefits could best be achieved. The group’s report, released in February 2016, recommended the creation of an Open Banking Standard using an open application programming interface. APIs define standardised methods for interaction with software systems. An apt metaphor is that of a plug socket that allows electrical devices to connect with the mains. In the same way, APIs allow mobile apps to ‘plug into’ third-party systems.

The rise in popularity among app developers of using APIs to incorporate third-party data highlights their potential for opening up customer banking data. As an example, Transport for London (TfL) provides live transport data feeds for third-party software developers. A number of mobile apps plug into these data feeds to provide real-time transport information to customers via a proprietary interface. Account aggregators will be able to display customer banking data in exactly the same way under PSD2.

More broadly, the ever-increasing affordability (and therefore availability) of technology for consumers and businesses alike is enabling the open-banking developments prescribed in the PSD2 and Open Banking Standard regulations.

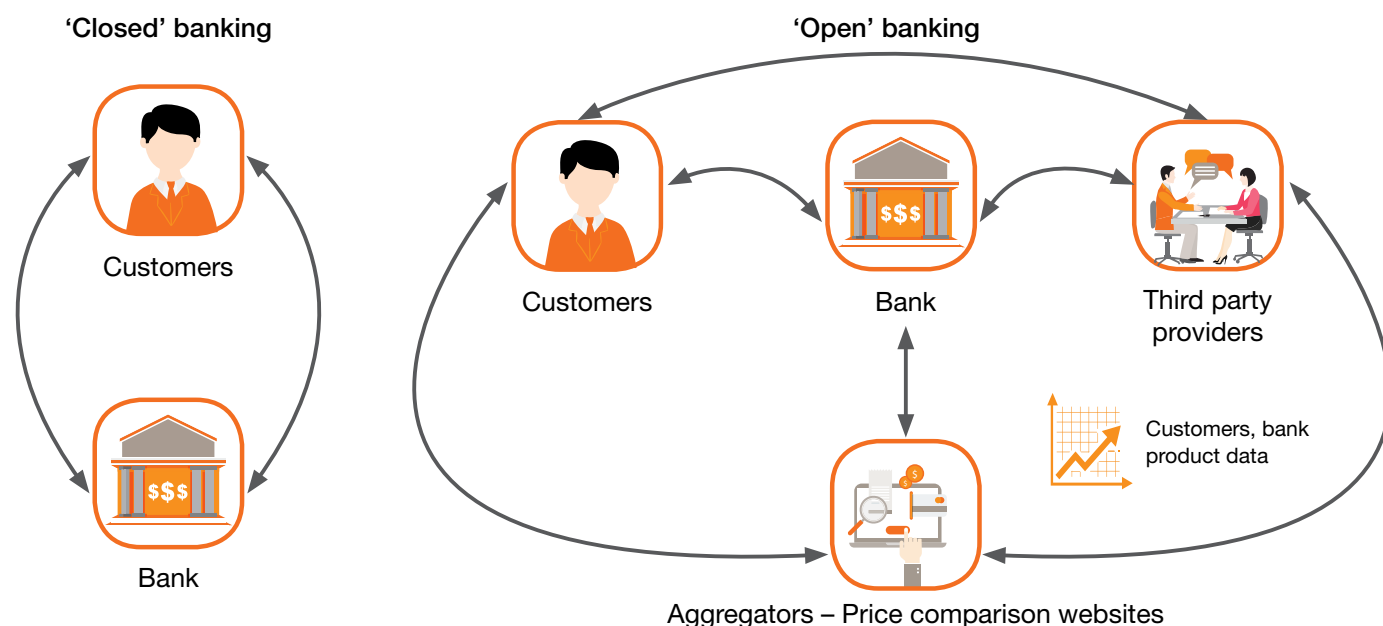
From a consumer standpoint, smartphone penetration has increased dramatically in recent years from circa 50% in 2012 to more than 80% by 2017, facilitating mobile access to applications and services for the majority of the UK population.

The OBWG recommended that this common API standard should allow:

- open access to open data – i.e. allowing anyone, from TPPs to individual customers, to access publicly-available data such as pricing and product information
- controlled access to shared data – i.e. granting regulated TPPs access to customer-account transaction data, provided the TPP has customer consent.

The UK’s Competition and Markets Authority (CMA), which had “concerns that retail banking may not be working well for customers”, released the final report of its investigation into the retail banking market in August 2016. The CMA decided to incorporate the Open Banking Standard into its remedies, making it mandatory for the UK’s largest banks to open up their retail customer and SME account data. Nine banks came under the scope of the CMA’s order. They were required to make open data available through open APIs by 31 March 2017. They need to make shared data available through open APIs by the PSD2 implementation date of January 2018. These banks are charged with setting the Open Banking Standard in collaboration with representatives of third parties and members representing the interests of consumers and SMEs.

The opening up of customer transaction data:



In addition to the tighter timeframe being enforced in the UK, there are two further main differences between PSD2 and the Open Banking Standard as introduced by the CMA.

Firstly, PSD2 does not mandate the creation of common API standards. This means that individual banks may make their data available through different technical standards. This appears to add an additional layer of complexity for account aggregation tools – complexity that the Open Banking Standard will mitigate in the UK.

Secondly, PSD2 only opens up access to customer transactional data for specific institutions, which must also be regulated PSPs. The CMA, on the other hand, may grant access to a broader range of third parties through its 'whitelisting' process. Most notably, the CMA has recognized that price-comparison websites (PCWs) do not fall within the scope of PSD2. It will therefore set up separate whitelisting arrangements under which PCWs can become authorised to access customer data.

Advances in technology and the evolution of the digital landscape, fueled by the always-on interconnected web, are now enabling regulatory interventions that have the potential to drive truly revolutionary change.

Open Banking is set to drive a fundamental change in the banking and payments landscape

One of the objectives of regulation at both an EU and a UK level is to level the playing field for new market entrants. This has led to two key pieces of regulation, which will open up bank-held customer transaction

data to third parties. We believe this development has the potential to transform the banking landscape radically.

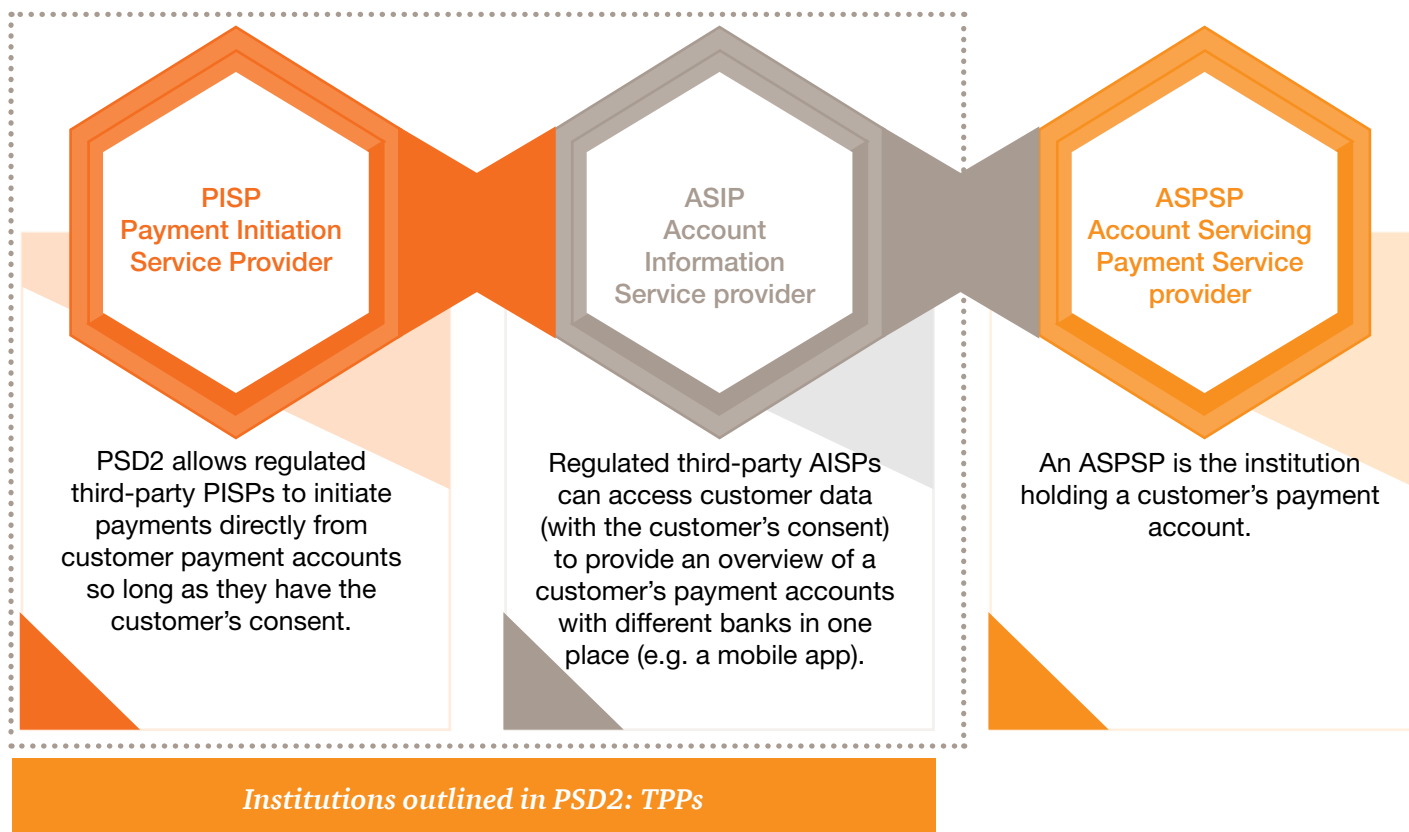
Bank ownership of this data has long given incumbents a competitive advantage in terms of pricing and risk scoring. This may now be eroded as data is increasingly shared with third parties. That's not all – this data could also potentially be used to provide consumers with innovative value-added banking services.

Critically, by offering services that use customer banking data to give consumers additional value, third parties may disintermediate banks' interaction with customers. The story begins with regulation from the European Commission in the form of the revised Payment Services Directive – more commonly known as PSD2.

PSD2 came into force on 13 January 2016, from which date member states had two years to transpose it into national law. According to the European Commission, PSD2's main aims are to:

- contribute to a more integrated and efficient European payments market
- level the playing field for payment service providers (including new players)
- make payments safer and more secure
- protect consumers
- encourage lower prices for payments

PSD2 is significantly broader in scope than its 2007 predecessor, as it also covers third-party providers (TPPs). In future, banks will be required to grant TPPs access to customer payment accounts, known as XS2A (Access to Account). PSD2 outlines two types of regulated TPP that will be granted direct access to customer accounts.



Under PSD2, institutions wishing to act as Payment Initiation Service Providers (PISPs) or Account Information Service Providers (AISPs) must be authorised payment service providers (PSPs). The regulatory technical standards for XS2A are expected to be in place by early 2019.

While ostensibly a payments-focused directive, PSD2's greatest impact will arguably be the opening up of bank-held customer account data to AISPs. If third-party AISPs gain significant traction, banks may lose their ownership of the customer interface, and, therefore, of the primary customer relationship. This threat may be further exacerbated if some TPPs choose to act as both AISPs and PISPs, allowing customers to initiate payments from their accounts via a third-party interface.

However, such providers will have to navigate complex issues around data protection and liability. The EU's General Data Protection Regulation (GDPR) requires customers to be made fully aware, in a clear, concise and transparent fashion, of how their personal data will be used and by whom. Customers will need to provide explicit consent for the usage of their transaction data. GDPR imposes certain legal duties on organisations to protect this data, and to ensure its accuracy and completeness.

Customers also enjoy many additional rights, such as the ability to revoke consent at any time, to know what data an organisation uses, and to have their information erased.

As open banking enables personal information to be shared between organisations, banks will need to ensure that this data is protected when being shared with other parties and that customer consent is clear and kept up to date. Greater third-party access increases the avenues through which fraud could occur, over many of which banks do not necessarily have the same level of control.

AISPs and PISPs will not be able to use data captured during payment transaction processes to enhance their business models. This is because the legislation forbids them to use this data for purposes other than the provision of their respective payment services.

Nevertheless, these steps towards opening up bank-held data mark a significant shift in how retail banks operate. Regulators in the UK are also eager to level the playing field for new banking entrants and to further exploit the potential customer benefits of banks opening up their data. They have capitalised on the requirements of PSD2 and put additional UK-focused initiatives in place.

As the UK regulators take action to further develop competition, the future market will be increasingly varied and modular, resulting in a very different banking experience for customers. Open Banking will give rise to new business models, with some providers choosing to specialise in narrow areas rather than offer a traditional suite of products or attempt to manage the customer's end-to-end experience. Others will compete by making it possible to integrate niche offerings from a number of different companies in a seamless way.

Banks take the threat of larger tech organisations such as Google, Amazon, Apple and Facebook very seriously. By facilitating financial services like payments directly on their websites and inserting themselves between the customer and the underlying bank, these players could relegate banks to the role of invisible 'plumbing'. While not every new player will prosper, we believe there will be room in the market for many different banks and non-banks to succeed.

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Open banking will bring more competition and new opportunities

The advent of Open Banking, enabled by technology and regulatory developments, will be particularly influential on competitive dynamics. Supported by a new regulatory regime, this initiative means that banks will be able (and required) to share more customer information than ever before. This will be achieved via technologies such as Application Programming Interfaces (APIs) which enable systems to be connected in a far more modular and component based way across organisational boundaries. Making infrastructure available through standardized interfaces will be a major trigger for new competition, from many different sources.

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of different companies in a seamless way. They might select which partners to work with, or they might give customers the choice to assemble a totally personalised suite of banking products and services from a financial 'app store'.

Already, a large number of FinTech start-ups are working hard to establish themselves as digital providers of services such as payments, investment, and lending. These 'digital value chain players' are focused on providing excellent experience and functionality at lower cost, for specific traditional banking services. Whilst the threat of FinTechs appears to be overplayed by the media, others thought they presented an opportunity to enhance their offering through partnerships. Fidor's use of Currency Cloud's payment engine and Metro's partnership with peer-to-peer lending platform Zopa provide examples.

Large tech players like Google, Amazon, Apple and Facebook pose an "existential risk" to banks, by facilitating financial services like payments directly on their websites and disintermediating banks that are subsequently "left out of the data loop". These players will drive the real change and disruption in the banking industry. By inserting themselves between the customer and the underlying bank they could take value from the bank, relegating them to the role of invisible 'pipes'. Apple has already started to do this with Apple Pay.

The Second Payment Services Directive (PSD2), is an example of legislation that is accelerating this shift towards Open Banking and subsequent use of APIs (Application Programming Interface), enabling banks, FinTechs and companies from other industries to transform the payments industry. An Open API or Public API is a free-to-use, publicly available API that provides developers with programmatic access to a proprietary software application. The Open Banking Ecosystem refers to all the elements that facilitate the operation of Open Banking.

Many of the CEOs viewed PSD2 as a significant opportunity to implement new digital strategies, as they will now have access to other banks' customer data and can become an Account Information Service Provider (AISP). In this scenario, banks could consolidate or aggregate data from a variety of banks and create new propositions, such as a dashboard presenting all customer account information in one place.

Modularisation

Providers of financial services are increasingly able to focus on very specific modules, or components, of banking services or products. This is largely being driven by new digital technology and Open Banking provisions within PSD2 and the CMA (Competition Markets Authority) Open Banking Remedy that enables direct access to consumers as well as integration of systems, within and across companies. Customers will have significantly more choice of products and providers they wish to use. Sometimes they may opt to engage directly with financial services providers (traditional banks, product specialists, or peer-to-peer (P2P) services); sometimes they may start at an intermediary (perhaps a comparison service, a broker or an aggregator); and sometimes the financial service will be in the background or even invisible as the consumer interacts with other companies (for instance, retailers, travel providers or social networks). In all of these scenarios the traditional banks will likely only carry out part of the end-to-end activity, with a complex web of interactions between multiple companies' systems. Customers will be able to combine these banking modules for a customized and personal experience.

Develop an Open Banking strategy:

Specialist banks and Fintech payment players will seek to maintain their position as differentiated specialist 'spokes' within a 'hub and spoke' model, and may benefit from having their offerings presented to consumers by aggregators.

However, there is a risk greater comparison of offerings will result in commoditisation and margin pressure. The impact (positive and negative) would be most significant for those who move fast to comply and participate in an open ecosystem.

Partnerships are likely to prove valuable to increase presence and the possibility of integrated offerings.

To be successful, each bank needs to overcome specific challenges

There appears to be significant customer perception issues for most of the banking groups. Each group also has specific strategic challenges. For example, many mid-sized high street banks face pressure to transform their operating models and differentiate their propositions, while digital-only players seek to build awareness with customers and attract them with distinctive service offerings.

To succeed, all banks will need to embrace new digital models whilst ensuring they make coherent strategic choices – for example, around which customer segments to target, and how to tailor their products and services to be differentiated in those segments. This will depend partly on new entrants' ability to differentiate themselves and grow their customer base, but also on the extent to which innovation drives new products and services.

We believe that customers will have increasing choice of the products and providers they wish to use. They may opt to engage directly with financial services providers (traditional banks, product specialists, or peer-to-peer (P2P) services); they might start at an intermediary (perhaps a comparison service, a broker or an aggregator); and sometimes the financial service will be in the background or even invisible as the consumer interacts with other companies (for instance, retailers, travel providers or social networks).

In these types of scenarios the traditional banks will likely only carry out part of the end-to-end activity, with a complex web of interactions between multiple companies' systems. Customers will be able to combine these banking modules for a customised and personal experience. New competitors from other industries will seek to command consumers' attention and strive to be the preferred interface. Unexpected alliances and partnerships will be created to provide more seamless and attractive propositions. All these factors will accelerate the trend towards a more modularised, diverse and innovative UK banking and digital payments market.



A wave of new Fintech entrants as the banking market has opened up

Over the 50 years from 1960-2010, the UK banking market saw significant consolidation. By 2010, 26 of the 32 banks and building societies which existed in 1960 were absorbed into just six major groups: Barclays, HSBC, Lloyds, Nationwide, RBS, and Santander. The concentration of the market became particularly acute in the aftermath of the 2008 financial crisis, when a number of failing banks were either merged or acquired. In its 2011 report, the Independent Commission on Banking (ICB) highlighted that following the 2008 crisis, the largest four banks accounted for 77% of UK personal current accounts and 85% of small and medium-sized enterprise (SME) current accounts.

In parallel with increased concentration, the banking market experienced relatively low customer satisfaction, as highlighted in a 2013 survey in which retail banking customers rated the main high street banks negatively for satisfaction.⁹ A study by the Financial Conduct Authority (FCA) and CMA also found that whilst many SMEs were generally satisfied with the service they receive from their bank, the satisfaction was often passive and low in relative terms. It also revealed that only 13% of SMEs believed that their bank acted in their best interest. Both studies included high levels of market concentration amongst the main high street banks as one of the key drivers for dissatisfaction.

The Bank of England and the UK FCA responded by simplifying the process for acquiring a banking licence and lowering the capital requirements for new bank entrants in 2013. As a result, there has been an increase in the number of banks and Fintech players entering the market – with a wide range of propositions and business models.

Access to payment systems – limiting new entrants?

Today, a small number of main high street banks with direct access to payment systems provide indirect access to the other banks and building societies. This arrangement imposes cost constraints on the other banks as they have a narrow choice of providers which limits their ability to negotiate on price. There are also barriers to switching as information about services and fees can be complex and opaque.

How market players are addressing these challenges

Several market players have undertaken initiatives to address payments issues. For example, since mid-2016, several new banks such as Metro and Starling have started to connect directly to Faster Payments (the UK's 24/7 real-time payment service, launched in 2008). Some of these banks plan to act as a sponsor for other payment service providers to access payments through its connection. Faster Payments thinks as many as 50 of the firms currently gaining access through the main high street banks could switch to the new providers.

The UK government and regulators are also working to identify new functionality and technology to improve clearing, processing and settlement in payments. Initiatives include the Bank of England's review of its Real Time Gross Settlement (RTGS) system, the Competition and Markets Authority's remedy on Open Banking and HM Treasury's work on the transposition of the revised Payment Services Directive (PSD2) which introduces new services and players into scope of the legislation.

The regulators have also made it possible for new entrants to apply for a BoE settlement account when they apply for a license, effectively shortening the process before banks can launch their products. Many of the CEOs of payment banks expect PSD2 and Open Banking rules to help them acquire customers by enabling them to act as product 'marketplaces', anchored around a current account.

Industry bodies such as the Payments Strategy Forum (PSF) have been established to drive collaborative innovation in payment systems. In November 2016, the PSF set out its strategy to enable simpler access, greater innovation, increased adaptability and better security. The PSR report on the supply of indirect access to payment systems raised concerns around "the ability of current technical solutions for real-time payments to meet the required quality of service". This may limit the ability of some banks and other large payment providers to compete in related markets, such as retail banking.

Non-bank brands could unleash the power of personalisation

The non-bank brands all benefit from having well known, trusted brands that they have inherited from their parent companies. This is particularly valuable in an environment where banking brands have been impacted by the financial crisis and conduct issues, and large numbers of consumers have mixed views about the banking industry. By nonbank brands building their identities around their parent groups' brand values, they are able to position themselves in a differentiated way.

The parent group also provides access to a large customer base, with large numbers of potential customers who have a proven affinity with the brand, including, in some cases, membership of loyalty schemes. In addition to being able to market their services to a receptive audience, the non-bank brands also have access to rich data about customers – this goes significantly beyond the traditional banking data set that competitors expect to work with.

The non-bank brands have all invested significantly in IT platforms, which they regard as essential for providing the digital experience their customers demand and the flexibility to grow and adapt the proposition. While these banks tend to be digitally focused, they should have the potential to change their physical footprint dynamically in response to customer needs, leveraging the extensive network of stores held by the wider group. This may help them to determine which services should be offered in person and to select locations in a very fluid way.

Proportion of British consumers that think non-bank brands have a more attractive offering than big banks

% of Customers (2017)



Source : You Gov ,PwC Strategy and Analysis

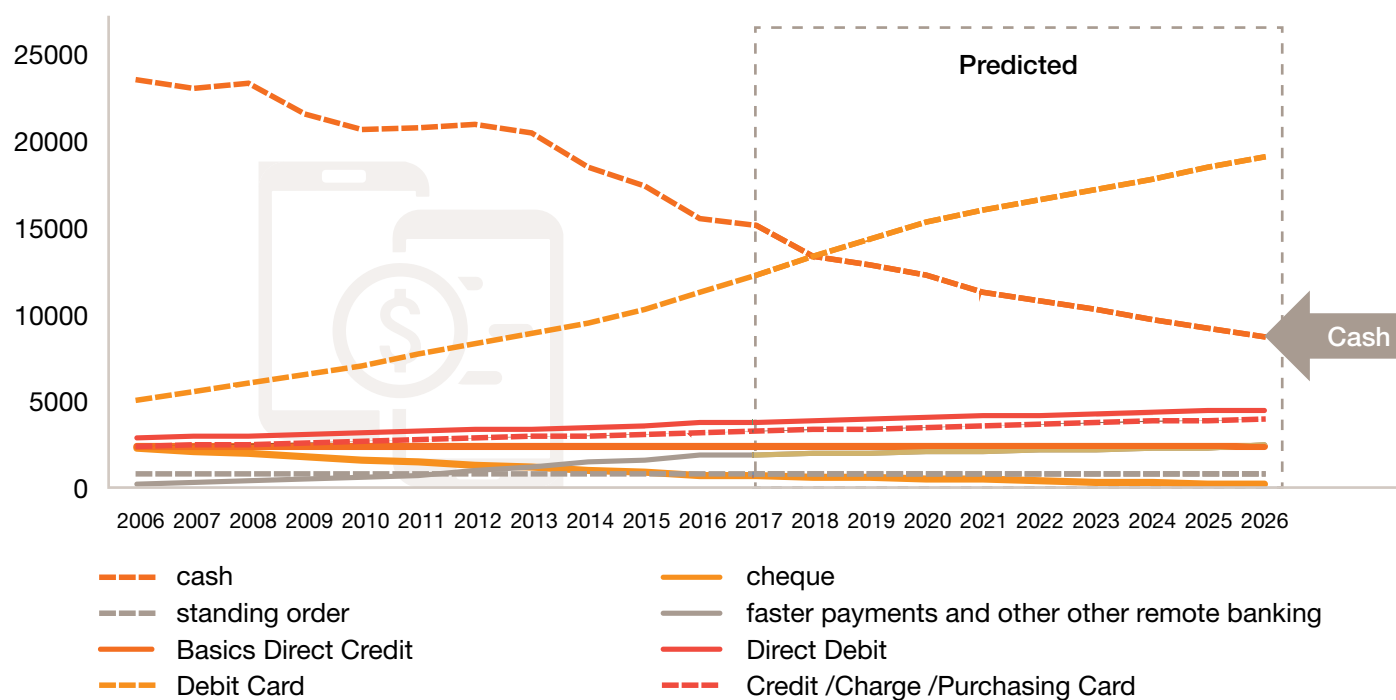


Opportunities and Challenges faced by Fintech Payment Firms in UK

The section below outlines all the potential opportunities and challenges faced by the Fintech Payment firms in the UK:

UK's Payment Fintech journey so far:

Share of payments in the UK made using different methods, by number of payments (millions)



It is evidently clear that the volume in cash transactions in the UK has shown a declining trend from its peak of circa 23bn transactions since 2006 and is projected to fall below 10bn by 2026. Digital payments through debit cards and mobile payments have shown a correspondingly increasing trend since 2006 and is projected to peak at close to 20bn transactions by 2026.

Key achievements and opportunities in the UK Fintech payments space:

UK as a Hub for Fintech:

- The payment systems underpin virtually every financial transactions made – whether that's major institutions transferring large sums of money to each other or consumers receiving their salary or pension into their account. As per the UK FCA's (Financial Conduct Authority that focuses on conduct risks and regulation) Policy Statement PS 15/1, in 2015-16 the UK payment systems dealt with more than 21 billion transactions worth around £75 trillion which is circa USD 100tn.
 - London's Fintech sector continues to fuel the growth of the UK's digital economy, with the capital's tech firms raising a record £2.45 billion and accounting for around 80 per cent of all UK venture capital tech funding in 2017.
 - Further analysis of the data shows that the UK and London remain the favorite destination in Europe for tech investors. UK firms attracted almost four times more funding in 2017 than Germany (£694m) and more than France, Ireland and Sweden combined. London tech companies also raised significantly more venture capital investment than any other European city, including Amsterdam, Berlin and Paris.
 - The year 2017 saw a number of the world's leading tech companies pledge their long-term commitment to London, with significant investments from Amazon, Apple and Google. In the second half of last year, Spotify announced it will expand its R&D operation in London and double its headcount, while US tech giant Facebook confirmed it will create an additional 800 jobs for its new London headquarters.
- represents a huge opportunity for banks, the wider Fintech players and for the end customers, it equally poses a challenge for the industry as a whole in terms of cost of compliance and the complexities involved
 - PSD2 is not only a regulatory compliance and technology challenge, but also a strategic and operational one. Meeting this challenge requires a clear strategy, operational and infrastructure change, a clear focus on assessing and managing risks, and meticulous execution.
 - Open banking has already initiated a visible shift from a closed banking model to one in which data is shared between different members of the banking ecosystem with authorisation from the customer.
 - Direct Debit is the most effective way to take recurring payments in Europe, offering lower failure rates and fees, along with increased flexibility compared to using credit or debit cards and the UK is leading this space. Some of the growing payment firms e.g. GoCardless currently processes more than £4 billion worth of transactions for over 30,000 organisations across the UK and Europe and seems to be growing fast. In fact in 2017 GoCardless processed 50% more of customers direct debit payments than the previous six years put together. GoCardless processed 33 million (volume) payments in 2017 serving circa 37,000 merchants. Across the UK, £1.3 trillion value of transactions were processed by direct debit in 2017 representing a 3.8% year on year growth over 2016.

Democratising the availability of financial products – Open Banking

The exchange of customer data under the Open banking regime will set the level playing field between incumbents and new entrants thereby increasing the competition. Even more importantly, open banking will facilitate the creation of new products and services that were previously impossible to imagine.

- Though it may appear that the threats to incumbent banks are greater than ever, so are the opportunities by way of partnering with new organisations. In an extreme scenario, some banks could be relegated to the background as infrastructure providers while other entities – FinTechs, tech giants and price-comparison websites (PCWs), for example – could come to own the customer relationship. As a result, these could potentially become the leading brands in banking – without ever taking customer deposits or lending onto their own balance sheets.

Policy and Regulation

- Payment Services Directive (PSD2) will give rise to open banking across the UK and Europe requiring banks to become more and more customer centric. The PSD 2 regulation is a comprehensive set of regulations on payment service providers covering ownership and governance of payment systems, direct and indirect access to payment systems and interchange fees requirements and serves as a global best practice for payment firms from emerging markets such as India. The phrase 'open banking' which is an implementation of PSD2 is used to describe the shift from a closed model to one in which data is shared between different members of the banking ecosystem with authorisation from the customer. Though PSD2

Incumbent banks that embrace open banking to create new sources of revenue and new propositions may enjoy a significant advantage, given their access to existing customers, strong brands and expertise. As a result, incumbent banks have a real opportunity to win the battle for the customer interface and, therefore, the customer relationship.

Potential challenges in the payment space in the UK:

Regulation

- High cost of compliance with the newly introduced Payment Service Directive (PSD2 effective from 13 January 2018) in terms of implementing the requirements of this regulation. Two-thirds of banks and Payment firms in the UK anticipate that PSD2 will affect all key functions, ranging from digital transformation to legal & compliance, IT and many others.
- By law under PSD2, banks will need to make customer data available in a secure manner, and eventually to give third-parties access to their customer's accounts. But equally important to these compliance efforts are the strategic implications for banks and payment firms on how they need to organize themselves and operate in a world of "open banking".
- PSD2 has numerous interdependencies with other regulations (such as GDPR and eIDAS Regulation), promising a complex implementation with multiple stakeholders.

Competition

- Stiff competition for new overseas Fintech Payment firms into the London Fintech market that is already matured and saturated coupled with the high establishment costs in London.
- Even though 13% of traditional payments companies believe that their business faces no Fintech related risk, those who recognise the threat are afraid that, on an average, as much as 28% of their business could be lost to the new players. This constitutes the highest percentage of all financial industry players.

Barriers to entry

- Lack of adequate preparation by new Fintech players to address the firm authorization requirements from the UK FCA and subsequently the PSR (Payment Services Regulator). Failure to understand and appreciate the regulators expectations could delay commencement of business and may potentially result in the applicant payment firm being denied the authorization license.

Due to the rigid regulatory landscape, new entrants still need to cooperate and co-exist with incumbents. Many FinTechs in the early stages of market presence find it hard to muster the necessary expertise, brand recognition, substantial assets and expensive authorisation required in the financial sector.





4

India Case studies – Google Tez and Paytm

This section outlines the case studies of Indian Payment firms Google Tez and Paytm in the Fintech space that has carved out a niche for themselves in the complex and challenging Indian Fintech eco-system considering the challenges around cost of regulatory compliance, lack of a seamless internet connectivity across India and absence of education and awareness among the major section of the population within India.

The success of both Google Tez and Paytm is primarily driven by the successful deployment of UPI. Unlike IMPS, where to make a payment one has to enter the account type, account number, bank name and IFSC code, UPI interface will allow users to receive and send funds from the smartphones using their mobile phone number, Aadhar unique identity number or virtual payments address. It saves the user from the trouble of filling up all the account details every single time a transaction is made.

Post the introduction of UPI there is no longer any need for an individual to use any app to exchange money. For example, if an individual having an UPI uses a taxi service, he just needs to provide his virtual UPI address and the driver can directly request money from it to his bank account or his e-money wallet. A message comes on the user's phone for authentication. Once the transaction is authenticated by entering the password, the funds are transmitted to the driver's bank account or e-money wallet as the case maybe.

UPI also addresses the security issue to a considerable extent and is a step forward from the mobile wallets. The transactions happen in a highly encrypted format and a MPIN instead of an OTP is used for authentication of the transaction. UPI has potential to make micropayments cashless which would benefit both buyers and sellers who are willing to enter into lower monetary value transactions.

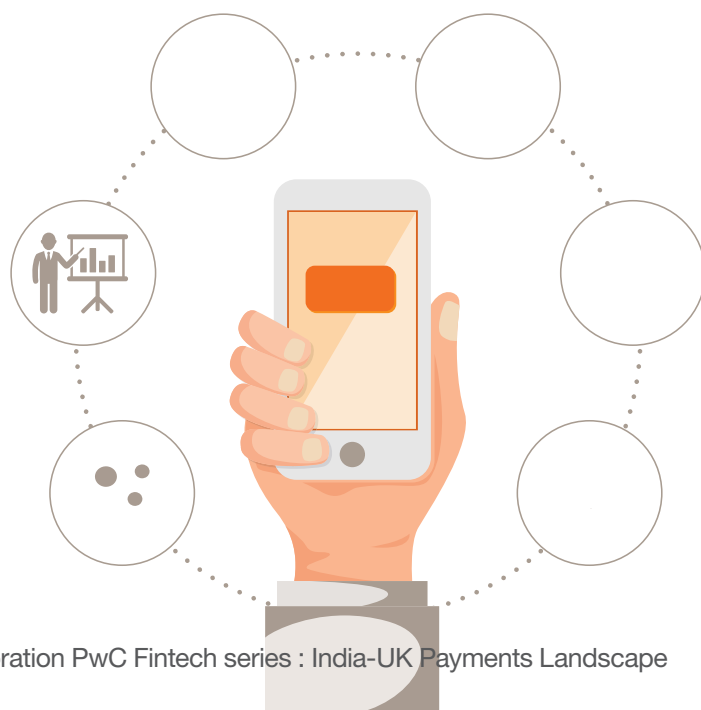
Google Tez is a mobile wallet based on the Unified Payments Interface technology. UPI-enabled wallets permit users to transfer money without the recipient's bank account details. The UPI ID of the recipient is used as a proxy for the account number and IFSC code and thus it makes the transfer of money much easier through the Google Tez mobile wallet. Money need not be stored in the Tez app to make digital payments. It works as an extension of the user's bank account. So, unused money remains in the bank and the user keeps earning interest on it.

Integration of the user's bank account with the Tez wallet is done via SMS message, and is not completed if the phone number associated with the account does not match, or if the user holds an NRI (Non-resident Indian) account which is not supported for this

feature. Users without a UPI id will have to create one and enter a secure UPI pin. Other means of making payments is by using the camera to scan a QR code, or entering the phone number of the recipient. The app automatically identifies contacts who have successfully registered with the Tez database. A fourth alternative is the 'Cash Mode' that allows quick transfers with nearby Tez users without sharing phone numbers. Cash Mode can be used to pay as well as receive money from devices within its range.

A snapshot of the leading UPI applications as of December 2017 is presented below:

	Google Tez	PhonePe	BHIM
Launched	September 2017	December 2015	December 2016
Promoter	Google	Flipkart	National Payments Corporation of India
App Downloads	12 million	55 million	21 million
Volume of transactions	140 million till December 5 since launch in September	1bn every day in November 2017	25 billion in November 2017



Google Tez is now integrating with the State bank of India that already has a 40 crore plus customer base and this partnership with Google Tez would help them drive innovation and deliver new opportunities. SBI currently processes 2 million UPI based transactions every day with a total combined credit and debit of over Rs 400 crore. Tez, since its launch in September 2017 has processed over 250 million transactions and has over 13.5 million monthly active users, across India.

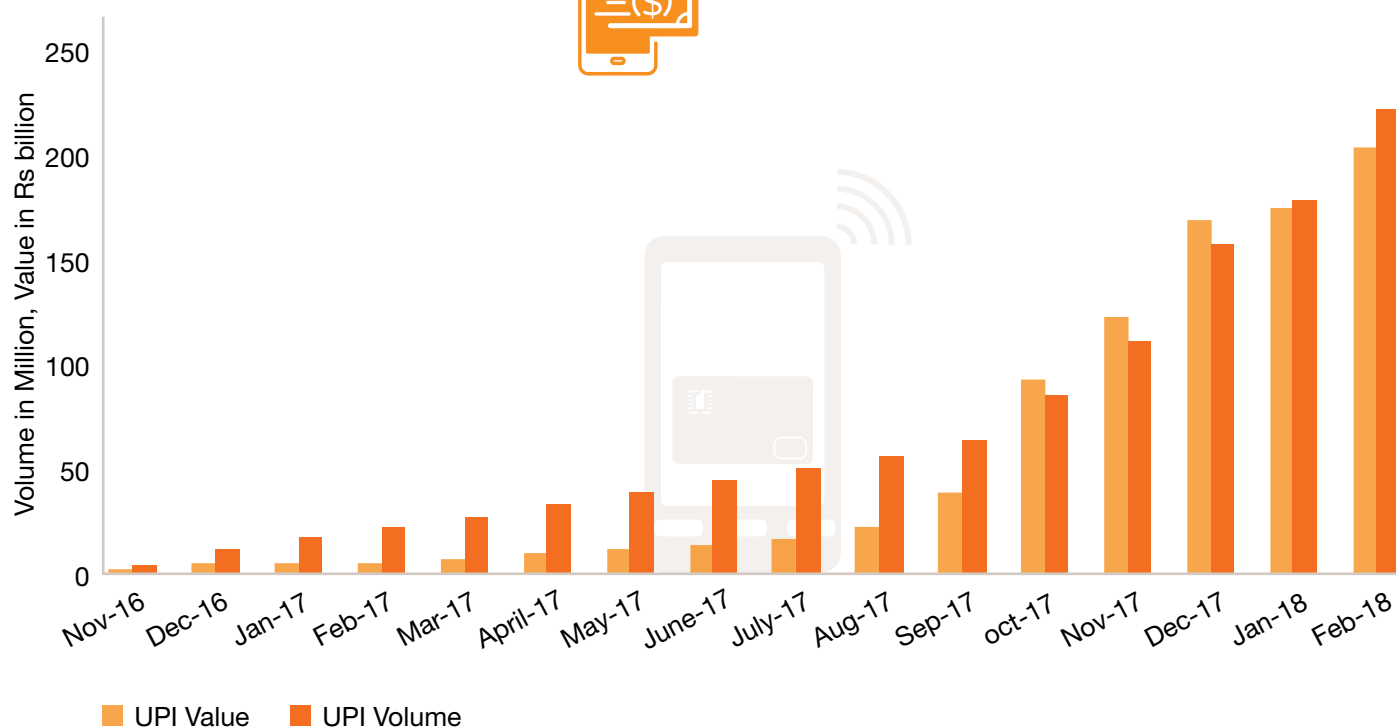
There were certain factors that played a huge role in the way Tez acquired a significant share of the Indian payment sector.

- With the demonetization in November 2016, the industry grew 55% in 2016-2017. As per a study by Boston Consulting Group, the Indian payment industry will be worth \$500 billion by 2020 and that accounts for 15% of the country's total GDP.
- UPI based payments work with all the major banks that offer UPI services such as - ICICI, Axis, State Bank of India, HDFC, etc. One does not need a mobile wallet to save balance as Tez keeps the user connected to bank account directly.

- One can use UPI PIN to log into the Tez application or can secure it with a fingerprint or a pattern lock. Google installed a 'Tez Shield', which is a multi-layered security feature which ensures data security on the app.
- To grab a share in the digital payment industry of India, Tez strikes the national chord of sentiments within India by supporting more than one language such as English, Hindi, Bengali, Gujarati, Kannada, Marathi, Tamil, and Telugu. This clearly gives an impression that this app is made for the natives resulting in more and more hits with increasing marketing and awareness initiatives.

As per the RBI data release for the month of February 2018, the value of transactions done through UPI increased from Rs 19 billion in February 2017 to Rs 191 billion in February 2018. The increase in the transaction value done through UPI has increased 10 times compared to the previous year.

Monthly digital payments Value and Volume



Source: Reserve Bank of India

Case study on Paytm

“Pay Through Mobile” or “Paytm” is India’s largest mobile payments, e-wallet, and commerce platform. It was founded in 2010 under One97 Communications Ltd. It started as a prepaid mobile recharge website. Paytm subsequently changed its business model to a marketplace and a virtual bank model. It is also one of the pioneers of the cashback business model in India. The company has customers both from villages and metropolitan cities. As a result, Paytm is in the top seven e-commerce companies in the country and is valued at \$10 billion as of January 2018. They have around 13000 working employees and a total fundraise of \$1.83 Billion.

Currently the business model has expanded beyond recharge to include utility bill payments, wallet payments and many other financial transactions. In addition, wallet to wallet transactions and wallet to bank transfers for many leading internet based companies like Bookmyshow, Makemytrip, IRCTC and many others also take place.

The revenue model for Paytm is divided into various segments. Amongst them is marketplace or the Paytm Mall that serves as the most beneficial marketplace for sellers. Revenue from this subcategory is generated as fees and commissions from the sellers, which differ for different category of products. Another source of revenue generation is recharge services and bill payments, both of which run on a commission based model.

All the promotional strategies of Paytm are focused on the use of Paytm wallet. It was launched in 2013 and now has more than 200 million registered users. Cashbacks helped Paytm retain its customers and guaranteeing the next transaction when cashback for the first reflected in the Paytm wallet. Paytm’s primary weapon is velocity of growth, and the acquisition of users and merchants, for each of its business lines.

As per the RBI guidelines, the money deposited by users in Paytm wallet is deposited by Paytm in an Escrow Account with a partner bank. This escrow account deposit fetches Paytm certain interest which is decided as per the contract between the bank and Paytm. Banks and payment gateways charge a fee equivalent to 1-3% of the money deposited for using their services. This fee can’t be charged to the customers as it will make them choose alternatives like UPI, IMPS, etc. However, the interest generated through the escrow account deposits is usually more than the expenses incurred which results in profits to the company.

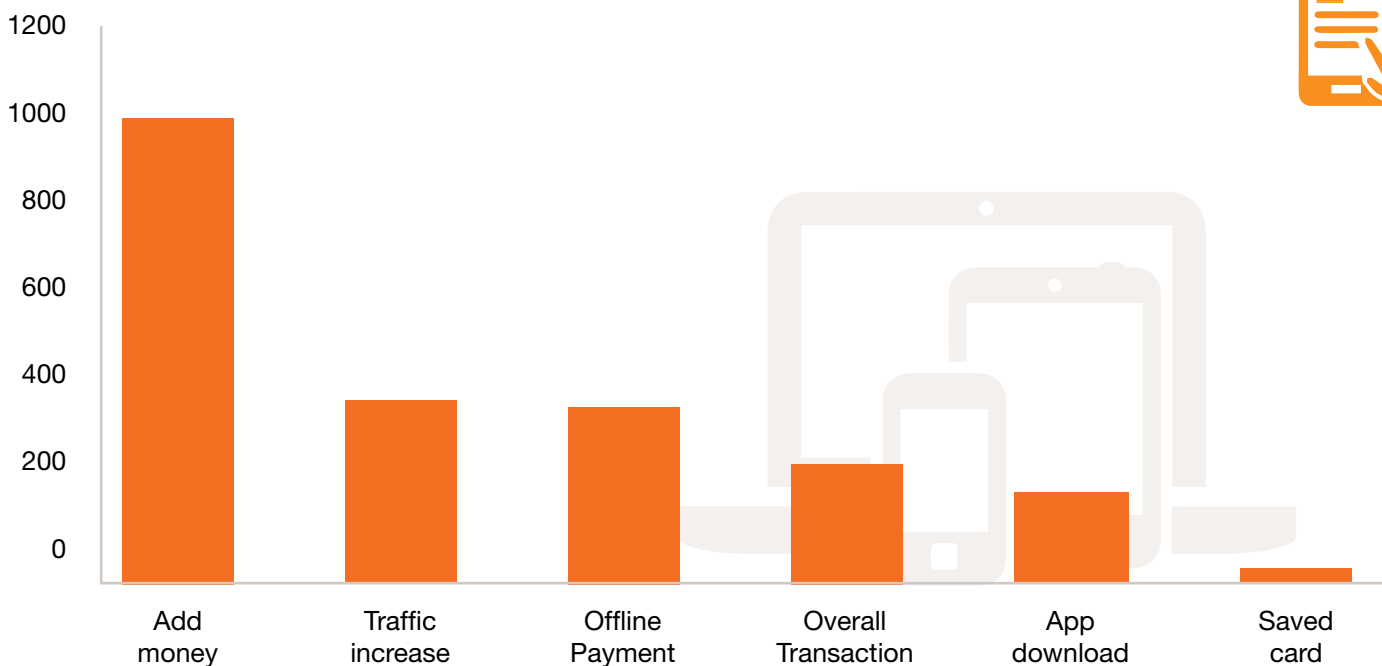
Paytm has recently come up with a payments bank which is a digital bank and can accept deposits and give out interests on the deposits but cannot offer loans to its customers. Paytm also issues debit cards with QR codes which can be scanned at various points.

The bank lets you open zero deposit digital current and savings bank accounts and offers a 4% p.a. interest on saving bank accounts and overdraft facility on your current bank accounts. There are no restrictions related to any type of transaction but any balance deposited over ₹1 lakh is moved to a fixed deposit with a partner bank.

According to RBI’s guidelines, prepaid payment instruments (PPI) such as mobile wallets have to complete the KYC requirements. Paytm responded to the RBI requirement either directly or by going to one of the many vendors chosen by Paytm to complete the KYC.

Paytm has acquired a major share of the e-payments space on account of various factors including but not limited to:

- Paytm was the first company that started online payments in India through an app and thus had the first mover advantage. With its extensive distribution strategy and cashback offers, Paytm increased its brand presence and brand preference.
- Paytm has tie-ups with more than 3 million merchants across India and thus it is more convenient to shop on Paytm. Additionally, it is operational round the clock and facilitates easy payment or transfer of funds anytime, anywhere.
- Paytm offers frictionless payments as users do not need to sign in and sign out every time they make a payment. It offers a variety of services on one platform which omits the need to go to any other application.
- Demonetization played a huge role in the wide spread use of Paytm and the increasing base of its customers. On November 12th and November 13th, Paytm claims to have registered a record of 5 million transactions per day and a 1000% growth in the money added to Paytm Wallets.

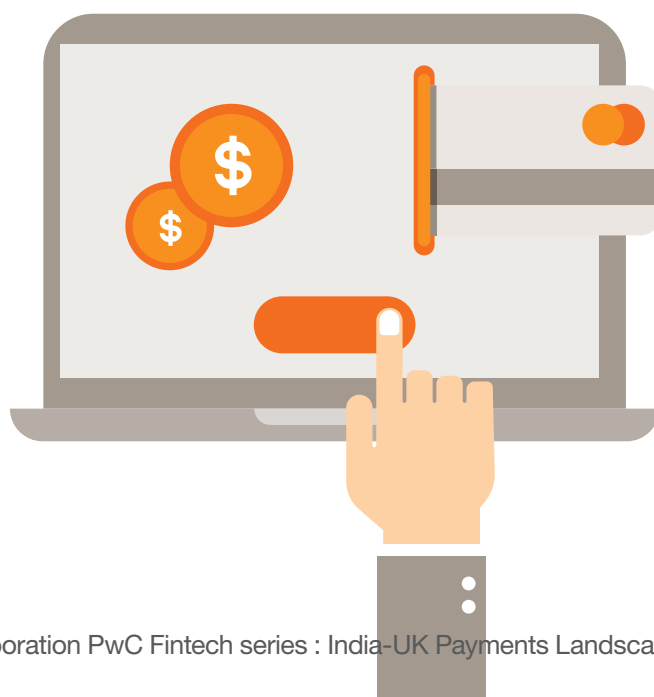


Source: Paytm Blog

Paytm is also coming up with a new platform – Paytm Money. It has taken SEBI's approval for becoming a registered investment advisor and will begin operations soon. It plans to launch easy –to –understand wealth products for the Indian masses. The first financial product offered on this platform will be Mutual Funds and investors will be allowed to invest with zero commissions.

The surge in the number of working professionals and the growing demand for aggregators provide a suitable environment for platforms like Paytm and Google Tez to establish themselves and expand. With the growth in technology, people prefer to make payments at the click of a button from the convenience of their homes. The government as a means of curbing corruption and increasing transparency is favoring the use of internet and e-commerce. The ministry also proposed to go cashless by waiving the service tax on card transactions. India has seen an unbelievable growth in internet usage in 2000 – 2016 by 9142.5%. But still only 36.5% of Indian population uses the internet and so there is a big scope of increasing the online market in the future. (Data Source: www.internetworldstats.com).

The case studies on Google Tez and Paytm clearly indicates the fact that despite the practical constraints highlighted in this document, payment firms with the right long term outlook and governance and strategy can deeply leverage on the burgeoning growth potential of the Payments market in India over the years to come.



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5

Way Forward

Considering the detailed analysis over the potential opportunities and challenges across the Fintech payments space in the UK and India, the scope of growth for Fintech payment firms from both these countries is considerably high.

The key themes in terms of potential opportunities and challenges across the Indian and UK payments firms that is worth reiterating from our detailed analysis include:

Sr. No.	Particulars	India	UK
A	Opportunities:		
1	40% of the total population of India is currently unbanked and more than 80% of the payments in India are still made by cash.		
2	The emergence of the Unified Payments Interface (UPI) has revolutionised the growth of digital payments across India since the past 2 years post demonetization		
3	Total financial transactions on India's (NPCI's) retail digital payment platforms is projected to grow by a whopping 400% from INR 200bn (circa £2bn) in 2017-18 to INR 1 trillion (£10bn) by 2023		
4	By 2020, around 720 billion transactions are projected to occur primarily through the use of UPI technology		
5	The UK payment systems in 2017 dealt with more than 21 billion transactions worth around £75 trillion which is circa USD 100tn		
6	Payment Services Directive (PSD2) will give rise to open banking across the UK and Europe requiring banks to become more and more customer centric.		
7	The introduction of open banking will result in democratizing the availability of all the financial products and services to the end customers at the best competitive price keeping customers need in the forefront.		
B	Challenges:		
8	Banks and Fintech payment firms should ensure their top management is part of developing a strategic response to open banking		
9	Need for adequate preparation by overseas Fintech players (e.g. India) to address the firm authorization requirements from the UK FCA and subsequently the PSR (Payment Services Regulator)		
10	High cost of compliance with the newly introduced Payment Service Directive (PSD2 effective from 13 January 2018)		
11	Cyber security is paramount to rebuilding this trust and this is where the UK's reputation as a leader in cyber security and India's expertise in software development could be leveraged to effectively mitigate this risk.		
12	Regulations on prepaid instrument (PPI) guidelines around KYC requirements could be based on a reasonable cost benefit analysis (CBA)		
13	Both the regulator and the Fintech industry could collaborate on skills development to create the required awareness on Fintech innovations around payments including cyber security.		

But a clear roadmap has to be developed for the payment firms from the UK and India to start tapping into each other's opportunities and work towards addressing each other's challenges. The following steps could possibly help create the roadmap and enable the payment firms to start acting upon it sooner than later:

- Organise a conference in London for the UK Fintech payment firms and provide a detailed presentation over the potential opportunities and challenges faced by Indian payment firms in India.
- Organise a similar conference in India for the Indian Fintech payment firms and provide a detailed presentation over the potential opportunities and challenges faced by the payment firms in the UK on the back of PSD2 and its implementation of open banking.
- On the back of these conferences, identify and work towards facilitating in-bound and out-bound investments for the Fintech payment firms in UK and India



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